PERFORMANCE ANALYSIS OF KISAN CREDIT CARD SCHEME IN THIRUVANANTHAPURAM DISTRICT

by

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(2016-11-100)

THESIS

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DECLARATION

I, hereby declare that this thesis entitled "**PERFORMANCE ANALYSIS OF KISAN CREDIT CARD SCHEME IN THIRUVANANTHAPURAM DISTRICT**" is a bonafide record of research work done by me during the course of research and the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society.

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Certified that this thesis entitled "**PERFORMANCE ANALYSIS OF KISAN CREDIT CARD SCHEME IN THIRUVANANTHAPURAM DISTRICT**" is a record of research work done independently by **Ms. Kshama A.V. (2016-11-100)** under my guidance and supervision and that it has not previously formed the basis for the award of any degree, diploma, fellowship or associateship to her.

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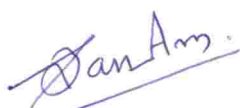**Dr. SANTHA A.M.**

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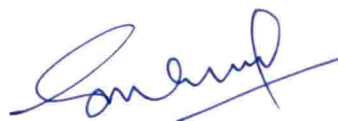College of Agriculture, Vellayani.

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LIST OF ABBREVATIONS

ATM	Automated Teller Machine
B:C	Benefit cost ratio
CAGR	Compound Annual Growth Rate
CSO	Central Statistical Organization
et al.	Co-workers
Fig.	Figure
GDP	Gross Domestic Product
GOI	Government of India
JLGs	Joint Liability Groups
KCC	Kisan credit card
MCRL	Marginal Cost of Funds Lending Rate
MDL	Maximum Drawl Limit
MFC	Marginal Factor Cost
MP	Marginal Product
MPL	Maximum Permissible limit
MUDRA	Micro Unit Development and Refinance Agency
MVP	Marginal Value Product
NABARD	National Bank for Agriculture and Rural Development
NAIS	National Agricultural Insurance Scheme
NIC	Non-Interest Cost
NPA's	Non Performing Assets

OLS	Ordinary Least Square estimate
PAIS	Personal Accident Insurance Scheme
PMFBY	Pradhan Mantri Fasal Bima Yojana
PoS	Point of Sale
RBI	Reserve Bank of India
RRBs	Regional Rural Banks
SBI	State Bank of India
SHGs	Self Help Groups
SPU-KCC	Special Project Unit-Kisan Credit Card
VFPCK	Vegetable and Fruit Promotion Council of Kerala
VIF	Variance Inflation Factor

LIST OF SYMBOLS

R^2	Coefficient of determination
^0C	Degree Celsius
ha	Hectares
ha^{-1}	Per Hectare
$year^{-1}$	Per year
kg	Kilogram
kg^{-1}	Per kilogram
km	Kilometer
mm	Milimeter
%	Per cent
q	Quintals
₹	Rupees
sq km	Square kilometer

Introduction

1. Introduction

Agriculture has a crucial role on the development of Indian economy. The agriculture and allied sectors contributes about 18 and 53 per cent towards GDP and employment respectively and around 10 per cent to the national exports in 2016-17 (Indian Economic Survey 2016-17-Key highlights). Institutional credit is the life blood of agriculture for facilitating technological upgradation, commercialisation and sustained growth of agricultural sector. Recognising the limitation of the multiple credit products and multi agency approach, the need for an integrated credit product emerged for accelerating the development process. Based on the recommendations of R.V. Gupta Committee, NABARD in August 1998 introduced Kisan Credit Card Scheme (KCCs) which is a land mark to address the credit needs of the resource poor farmers in the history of rural credit.

The KCC is aimed at providing timely and adequate credit to the farmers in a flexible, hassle free and cost effective manner. In addition to credit for crop production the scheme provides credit for ancillary activities related to crop production, working capital needs of non-farm activities and allied activities with some provision for consumption needs, through single window system. Every farmer who avails KCC is covered under Personal Accident Insurance Scheme (PAIS) and all crop loans taken under the scheme is covered under Pradhan Mantri Fasal Bima Yojana (PMFBY) so that the crops are insured.

Eligibility

Farmers- individual/ joint borrowers who are owner cultivators, tenant farmers, oral lessees and share croppers, Self Help Groups (SHGs) or Joint Liability Groups (JLGs) of farmers including tenant farmers, share croppers are eligible under the scheme (RBI, 2017).

Procedure for availing the KCC

The banks should make adequate arrangements for the collection and processing of the applications for the crop loans before the upcoming crop season,

thereby avoiding the delay in the sanction of credit to the farmers at a correct time. The farmers, after obtaining the application for KCC from the bank near to them, should keep ready some of the documents such as two passport size photographs, ID proofs, proof of land holding duly certified by the revenue authorities, cropping pattern (crops grown) with acreage and a security document if loan limit is above ₹1.00 lakh. The proofs should be attached to the application while submitting to the bank.

The banks after accepting the application take the legal advice from their advocates. Once the application is legally sanctioned, an agricultural officer of the bank along with the manager will go for the field visit of the farmer. If in the field visit the bankers find that the information provided by the farmer is accurate then the application is further processed for the sanction of KCC and all the eligible farmers will be provided with passbook and a KCC RuPay card.

If the farmer is availing the credit from a co-operative bank then firstly he should become a member of it by paying a fee of ₹100 for lifetime, and after becoming a member only he will be eligible to carry out transactions in the bank. The land details provided with the application form by the farmer should be cross checked with the revenue records of the village. The land cultivated may include own land, leased land and land cultivated as tenants/ share croppers.

Nowadays all the crop loans are provided under the KCC scheme as there is no ceiling on the quantum of loan. The loan is need based considering the cropping pattern, acreage and scale of finance.

Disbursement of the loan (RBI, 2017)

The short term component of KCC is in the nature of revolving cash credit facility, whereas the long term loan for investment purposes may be drawn as per instalment fixed. Some of the delivery channels of the credit are as follows: through branch, using cheque facility and withdrawal through ATM/ debit cards. Some of the newly suggested and implemented means are through Business Correspondents and 'banking outlets/ part-time banking outlet, Point of Sale

(PoS) available in sugar mills/ contract farming companies, etc., especially for tie-up advances and with input dealers and mobile based transfer transactions at agricultural input dealers and mandies.

Rate of Interest/ Interest Subvention (RBI, 2017)

Short term crop loans are provided at an interest rate of 7 per cent per annum (fixed) upto ₹3.00 lakhs per season/ per farmer. As per GOI, it is subjected to interest subvention of 3 per cent per annum to the bank on these advances.

An effective interest rate of 4 per cent per annum is charged to the borrowers who repay the loan in advance/ timely repayment by providing an interest subvention of 3 per cent per annum as per GOI directives.

If the loan becomes overdue, then, that interest rate will be linked to one year Marginal Cost of Funds Lending Rate (MCRL) plus spread (as determined by the bank from time to time). If the farmers are availing the loan above ₹3.00 lakhs loan limit over and above the interest rates applicable then a concession of 0.5 per cent per annum is given to such farmers.

KCC Renewal procedure (RBI, 2017)

The card is valid for five years, but the account needs annual renewal. Simple declaration by the farmers with regards to crop raised/ proposed to raise should be given to the bankers and then the Maximum Drawl Limit (MDL) of the farmer will be fixed which will result in continuation or reduction or enhancement of the limit. If the borrowers repay the loan amount in advance of the due date, then, he/she will be eligible for the review of loan limit. Under the review of loan limit a revised MDL with 10 per cent increase in short term component of MDL (excluding investment credit component of small value) will be made available to him/her. Borrowers can take advantage of this as 'off season' cost benefits in purchasing inputs for cultivation. Hence it will result in enhancing the MDL for the year more than Maximum Permissible Limit (MPL). The branches should access and sanction the credit requirement as applicable to the new sanction.

Security (RBI, 2017)

Hypothecation of crop is done for the KCC loans up to the limit of ₹1.00 lakh as banks waive margin/ security requirements. Hypothecation of crop up to card limit of ₹3.00 lakh without insisting on collateral security the loan is disbursed with the tie-up for recovery arrangements. Collateral security may be taken for the loans sanctioned up to a limit of ₹1.00 lakh on the discretion of the bank in case of non-tie-up arrangements and above ₹3.00 lakh in case of tie-up arrangements.

Mandatory's under KCC (RBI, 2017)

Crop insurance is made mandatory and every farmer availing credit under KCC will be covered under PMFBY. A farmer growing a notified crop under a notified area will be eligible for insurance coverage. At the time of submitting the application for KCC every farmer should be informed about the PAIS and the Health insurance schemes and bankers should ensure that every farmer is registered under this scheme. The premium amount will be shared by the bank sponsoring KCC and the farmer borrower.

Having all these benefits more number of farmers are attracted towards the scheme by the extension activities carried out by banking institutions through advertisement and other promotional activities.

It was found that in India the total number of KCC's issued is 8.46 crores and in Kerala the total number of KCC's issued is 30.54 lakhs which accounts to 46.45 per cent of the number of operational holdings in Kerala (Samantra, 2010). In this context the present research work is taken with the following objectives:

a) To study the progress and performance of Kisan Credit Card (KCC) scheme at the macro and micro level.
b) To identify the constraints faced by the beneficiaries.

Scope of Study

In Kerala large number of farmers practice year round cultivation on their farm which necessitates credit all through the year. Even though the credit is available, procedure is lengthy for sanction of the credit and no guarantee that the credit will be available when it is needed by the farmers. Here the KCC ensures adequate and timely credit at reduced cost and minimizing the problem of multiple financing to a certain extent. Hence the study was undertaken to know the cost of credit, adequacy of the credit and also the benefit and cost of the farmers availing credit and the constraints faced by beneficiaries in availing the credit. This study may help the planners and policy makers to formulate necessary policies to expand the credit to those who are not under KCC scheme by rectifying the debects already existing in the scheme.

Limitations of Study

The secondary data pertaining to the district level was not available for the study. The data pertaining to the costs and returns for the cultivation of the crops was not recorded by the farmers. The respondents were trying to recall the cost incurred by them in obtaining the credit from banking institutions. Hence it was memory based data was collected as primary data.

Presentation of the Thesis

In order to give a clear picture about the problem under study the thesis has been presented order mentioned as

1) Introduction – this chapter includes brief introduction about the problem, objectives, scope of study and limitations of the study.
2) Review of Literature – this includes the results and findings of the related works by different authors.
3) Material and Methods – Involves the materials used for the study and the method for the analysis of the collected data.
4) Results and Discussion – includes the results obtained from the analysis of the collected data and its interpretations.

5) Summary – includes the summary of the entire study.

6) References and abstracts are given at the end of the thesis.

Review of Literature

2. REVIEW OF LITERATURE

A critical review of the past work is essential to have a thorough understanding of the topic. In this view the reviews were collected regarding the distribution of KCC, amount sanctioned, amount utilized, cost of cultivation and the factors influencing the adoption of the scheme and presented in this chapter under two headings.

2.1 Progress and performance of KCC

2.2 Impact and constraints of the scheme

2.1 PROGRESS AND PERFORMANCE OF KCC

A study by Sangitha (2007) revealed that, at Kerala state level the number of cards issued through Primary Agricultural Co-operative Societies was found to be 10,41,830 as on August 2006 and the amount disbursed as on march 2006 was found to be ₹1.02 lakhs. In case of commercial banks as on September 2006 the number of cards issued was found to be highest by the State Bank Group followed by Nationalized banks and Private sector banks (48.3, 45.5 and 6.2 per cent respectively). In the same way the amount sanctioned was found to be highest by the Nationalized banks followed by State Bank Group and Private sector banks (₹1294.24 , ₹1115.24 and ₹424.57 lakhs respectively).

The study revealed the poor performance of RRB's and Co-operatives in the southern states of India in terms of issuing of the cards except in the state of Karnataka where the performance of issuing the cards was better. It was also reported that number of cards issued was 35.7 lakhs which accounted to an amount of ₹9148.4 crores from the commercial banks alone. Researcher also pointed the west and south zone performance was excellent in terms of coverage of the land holding in each zone (Kamble, 2009).

The study conducted in 2007 at all India level indicated that the KCC scheme was accepted both by farmers and the banks further with the flexibility of the scheme the repayment by farmers and the recoveries of the loan by the banks

were improved. The study also showed that during February 2007 the total number of cards issued was 665.6 lakh. The growth rate of the cards issued was highest in the co-operative banks with 49 per cent followed by commercial banks 38 per cent and RRB's with 12 per cent. NABARD has also taken steps to include the farmers under the PAIS scheme by paying the nominal premium amount (Karmakar and Mohapatra, 2009).

The distribution of KCC is being increased every year at all India level. The study reported that co-operative banks possess the highest distributional share of 44 per cent followed by commercial banks (43 per cent) and the RRB's with a share of 14 per cent as of 31 March 2009. In Punjab the distributional share of KCC was more than double of the households present. The study also showed that density of the KCC depending on the operational area was spread from 0.07 ha^{-1} in Jammu and Kashmir to 1.7 ha^{-1} in Kerala (Kumar *et al.*,2010).

Samantra (2010) from his study revealed the number of KCCs issued was 8.46 crore at the end of 2008-09 by banks throughout the country. The state wise progress of the number of cards issued showed that Uttar Pradesh was leading (18 per cent) followed by Andhra Pradesh (17 per cent), Maharashtra (10 per cent), Tamil Nadu (10 per cent) and Karnataka, Madhya Pradesh, Odisha and Rajasthan (6 per cent). The study also highlighted that the maximum number of KCCs issued agency-wise was topped by commercial bank (43.5 per cent) followed by co-operative banks (42.7 per cent) and regional rural banks (13.6 per cent). Hence he concluded that there was a horizontal growth in the KCC by covering more farmers by the banking sector.

Kondan *et al.* (2011) conducted a study in the Northeastern states of India and they found that in the states of Manipur and Assam the co-operatives banks were leading in the issue of number of cards and amount sanctioned, whereas in the state of Assam both RRB's and commercial banks were leading in the number of cards issued and the amount sanctioned as at the end of March 2009. The total percentage of the number of cards issued under this scheme was 0.81 percent and

the total amount sanctioned was 0.51 percent in the Northeastern region. The progress of the KCC when compared to other states of India it was relatively poor in the Northeastern states especially in the state of Sikkim.

Olekar (2011) stated that the policies of the banks which is availing credit to the farmers will decide the rate of interest at which the loan amount has to be availed. According to this the co-operatives are issuing the credit at a higher rate of interest. The researchers also mentioned about the limit set by the banks per cards, in this case the commercial banks are having the highest limit followed by RRB's and co-operatives.

Co-operative credit institution played a major role in the distribution of credit for the various activities of farmers in the state of Andhra Pradesh. KCC was introduced in June 2004 as a credit package for the refinement of the agricultural credit. Upto November 2007 since inception the number of cards issued was 705.55 lakh. Within the sanctioned limit of the borrowers the scheme covers both the consumption credit and the farm credit or the investment credit (Devi, 2012).

The results of the study showed that during 2010-11 at all India level, the number of cards issued was 7.26 million and the credit limit sanctioned was ₹43,370 crores. The cumulative of the number of cards issued were considered from the period of 2006-07 to 2010-11 which accounted to 100.93 million cards, out of which 45.03 million (44.62 per cent) cards were issued by commercial banks, 40.70 million (40.33 per cent) cards by co-operative banks and 15.20 million (15.05 percent) cards by regional rural banks (Jampala et al., 2012).

In presenting the present scenario of financial inclusion in India the author has mentioned KCC as one of the components of financial inclusion with no frill accounts and also making the credit available to the farmers at a correct time and with ease. There was 15 per cent growth rate of KCC during the year 2011 and the amount outstanding during the stood upto ₹13.16 lakhs whereas the amount issued during the period was ₹202.89 lakhs (Rao and Bhatnagar, 2012).

The study conducted by Uppal and Juneja (2012), the average growth rate of cards issued at all India level during the study period of 2009-2011 by different banks in their order is as commercial banks (0.38), regional rural banks (0.36) and co-operative banks (0.23). In same way the average rate of amount sanctioned by these banks are commercial banks (0.59), regional rural banks (0.53) and co-operative banks (0.27).

In Bihar there was a campaign carried out for the issue of KCC and also the issue of Land Possession Certificate which the author suggests to carry out throughout the Eleventh Plan so that more farmers are brought under KCC. It envisaged to bring 35 per cent farmers under the scheme and the target set by Government of Bihar was to cover additional 15 lakh farmers. During the year 2008 the campaign was started in 12 districts of Bihar covering only 2.5 lakh farmers whereas at the same time at the national level 77 percent of the farm household possessed the KCC (Singh and Singh, 2013).

Bindage *et al.* (2014) showed that in the state of Maharashtra there was a compound growth rate of 7.74 per cent per annum for the KCC issued which was consistent with the growth in KCC issued for the cropping year 2010-11. In the same way the study area Kolhapur showed a positive relationship with the increase in number of cards issued and the amount sanctioned under the scheme.

The regional rural banks are doing quite well in fulfilling the objectives of the scheme and serving the farmers to fulfil their crop loan demands while the growth performance of co-operative banks had not been satisfactory in issuing cards and amount sanctioning in the state of Haryana (Godara *et al.*, 2014).

The author while mentioning of the level of financial inclusion in India said NABARD has introduced microfinance scheme (1992) and KCC scheme (1998) mainly to cater the financial needs of the farmers, women, poor and weaker section of the society thereby enhancing their socio-economic status of their living. The KCC has been implemented by the District Central Co-operative banks, RRB's and the Public Sector Commercial banks. It was found that the

amount sanctioned all India level till the end of March 2012 was ₹5,72,617 crores and number of cards stood upto 11.39 crores (Kolloju, 2014).

Rajmohan and Subha (2014) said there is a positive growth in the number of KCC holders in the country during 2009-13. They have also stressed on the PAIS (Personal Accident Insurance Scheme) which is mandatory to the beneficiaries of the scheme wherein a amount of ₹25,000 is given to the person with permanent disability due to accidents and an amount of ₹50,000 to the family of the person who die due to accidents. The premium amount is shared by the sponsoring bank and the farmer in the ration of 2:1. The sharecroppers, tenants farmers, oral lessee and joint liability group were also recommended to be issued with the KCC by the banks.

A study conducted by Subramanian (2014) assessed the pre and post Kisan credit period for the short term agricultural credit in India. It was found that both in pre and post Kisan credit period the RRB's have the highest compound growth rate when compared to other financial institutions.

A study conducted in Jammu and Kashmir indicated that the total number of KCC's issued till March 2012 was 1,24,365. In the Kashmir region the total coverage was 33.86 per cent and the highest was recorded in Anantnag district (75.62 per cent) whereas in Jammu region the total coverage was 37.53 per cent but when Jammu district alone was considered the coverage was 39.75 per cent. The overall coverage of J&K state as a whole was 35.69 per cent hence government has to motivate the farmers stating the benefits which they can avail through the scheme (Sunder et al., 2014).

Thejeswini et al. (2014) in the study has mentioned NABARD has setup SPU-KCC (Special Project Unit-Kisan Credit Card) to provide incentives to the RRB's and the co-operative banks to issue more number of KCC's in the Rupay cards, so that transactions becomes easier. There was 31 per cent growth in the KCC from 1998-99 to 2011-12. The potential of commercial banks with respect to

the growth rate was least (30.93 per cent) compared to RRB's with the highest percentage growth (52.52 per cent) and the co-operative banks (30.51 per cent).

KCC was introduced under the second phase of the financial inclusion (1990-2005) with no frill accounts. This facilitated the farmers for the easy accessibility of the credit at a timely and a flexible way to meet their farm needs and a part of consumption need thereby improving their socio-economic status of their life. The author also found variation in the number of cards issued and the amount sanctioned during a period of 2010 to 2013 and the variation found was 9.48 million cards and ₹1,382.91 crores when compared to 2010 (Baral, 2015).

Dar (2015) reported that about two-thirds of the farming households in India possess the KCC. He has also shown that there was increasing growth rate ie. 44 per cent growth rate in the distribution of KCC per annum. RRB's have recorded the highest growth rate of 75 per cent followed by the co-operative banks (46 per cent) and the commercial banks (44 per cent). The study also showed that in Punjab the distribution of KCC's was more than two-times the number of operational households.

Dhanalakshmi and Velmurugan (2015) in their study aimed at covering the people who were not touched by the banking especially the rural people who should be brought by some successful liberation model. In this regard they have mentioned that the RBI has followed bank-led model for the financial inclusion under which KCC was one of the products of financial inclusion. According to them the number of cards issued upto March 2013 remained at 33.79 million as compared with 2010 which was 24.31 million. The total amount outstanding upto 2013 was ₹2622.98 billion.

In the state of Mizoram the rural banks started the KCC scheme in 2007 in order to provide a timely and flexible credit to the farmers to meet their needs of production and consumption. It was found that the growth rate of amount disbursed was 39.37 per cent in 2008, diminished to 9.01 per cent in 2010 and during 2013 it became negative 31.59 per cent. The researcher has suggested that

the banks has to take precautionary measures to prevent the creation of Non Performing Assets (NPA's) due to higher amount outstanding (Fanai and Singh, 2015).

The study conducted in the Hailakandi district of Assam showed that there was a large gap between the target set for the issue of KCC and the amount to be sanctioned and the achievement of the target during the study period from 2007-08 to 2011-12. It was also found that commercial banks were leading in the issue and the sanction of the KCC in the study area. The co-operative banks showed a very poor performance under KCC issual and sanction of the credit. The study indicated the decrease in the percentage achievement in the issue of KCC. There was 116.28 per cent increase in the financial achievement during the year 2010-11. About 61.31 per cent of total cards issued and 72.64 per cent of the total amount sanctioned by the commercial banks in the study period. Whereas the regional rural banks contributed 41.45 per cent of the number of cards issued and 47.29 per cent of the amount sanctioned under KCC during the study period (Gupta and Dey, 2015).

A study conducted in Bellary district of Karnataka showed that commercial banks are leading in the issue of KCC followed by the co-operatives and RRB's, whereas the amount sanctioned was led by commercial bank followed by RRB's and Co-operative banks. It also showed that in North-east region of Karnataka RRB's are playing a major role in the issue of KCC's when compared to other financial institutions. The study also indicated that more than one KCC was issued per household which was leading to duplication, hence measures has to be taken from the issuing financial institution during the issue of the cards (Jainuddin *et al.*, 2015).

The study revealed that KCC was introduced with a aim of providing the farmers the term credit, thereby giving a part of it for the consumption purpose. This scheme has also made farmers the ease of accessibility of the credit and also flexibility in the transactions of credit. It was also observed that to the end of

March 2013 the number of card and the amount outstanding under the scheme by the commercial banks, co-operative banks and regional rural banks were ₹10 crore and ₹5,34,681 respectively (Matkar and Jadhao, 2015).

The authors are of the opinion that the KCC is acting as a new innovation for the development of the rural economy in the past few years. They have found that during the year 2010 around 10 crores cards were issued and the amount disbursed stood at ₹ 4,27,748 crores. The main reasons for the popularity of the scheme was less stipulate norms, highly focused on agricultural needs, forward and the backward linkages, contract farming etc. which inturn led to increase in the flow of credit into agricultural sector (Rajababu and Ahmed, 2015).

The study by Reetu (2015) analysed the KCC's issued, amount sanctioned by different agencies and proportionate share of different agencies from 1998-99 to 2012-13. From the analysis of KCC issued and total amount of KCC's sanctioned by various institutions it was seen that on the whole there was impressive progress in KCC scheme. It was concluded that the growth of co-operatives was much less compared to commercial banks and regional rural banks.

During the year 2011-12 it was observed that the number of KCC's issued by different financial institutions showed variations in the cards issued across various regions of India. The Southern region (27.8 per cent) topped followed by Central region (27.41 per cent), Eastern region (20.63 per cent) and the least by the North eastern region (3.38 percent). The author has concluded that North and North- eastern region were the poor performers of KCC during the study year (Alexpandi and Sivakumar, 2016).

In the state of Haryana the performance of co-operative banks in the issue of the cards as well as amount sanctioning is very poor and it was observed that the scheme was showing positive move as number of KCC's disbursed was greater than the number that is sanctioned (Gahlawat and Gill, 2016).

Mehta *et al.* (2016), concluded saying as of 31 March 2012, the cards issued by RRBs was 4.05 lakh leading to achievement of 81.2 per cent of its target. But the commercial banks had issued 35.7 lakh cards and an amount of ₹9148.4 crores to different categories of farmers. The author has suggested for making the procedure easy for availing this benefit from banks and also banks should concentrate more on poor performing zones in terms of coverage of land holdings of different categories of farmers.

The credit flow to agriculture was quantitatively and qualitatively very low and it covered only 51 percent of the total credit needs of the sector. Hence the NABARD and Government of India took steps to introduce a new credit product KCC's. Through which the farmers had a chance to repay the loan by rescheduling the repayment period in times of bad environmental conditions and also the repayment period was extended to 4 years under this scheme for the medium term credit and also the withdrawal of credit was made easier by the use of slips, cards and the passbook (Sharma and Goyal, 2016).

2.2 IMPACT AND CONSTRAINTS OF THE SCHEME

Singh and Sekhon (2005) stated that as many as 73 percent of the KCC beneficiaries were satisfied with the present cost of accessing the KCC limit and all the farmers were satisfied with the operational efficiency of the KCC's in the state of Punjab during the survey year 2002-03.

Kumar *et al.* (2007) reported that the requirement of heavy margins and collaterals are still in vogue which further precludes landless and small holders from assessing the institutional credit. The proportionately higher use of KCC's indicates that if procedures are made simple, the access to institutional credit can be enhanced.

Vedini and Durga (2007) reported that the contribution of non-institutional source of credit has been reduced since the introduction of KCC. They conducted a study in order to know the quantity of credit that will be borrowed by the farmers through institutional and non- institutional agencies, awareness about the

scheme to different categories of the farmers taking different parameters into account and know the cost of borrowing of the credit by KCC holders and the non-KCC holders. They concluded that the scheme was more beneficial to the small and marginal farmers in Andhra Pradesh.

Singh *et al.* (2008) found that the amount of credit availed by the small and marginal farmers was higher when compared to the large farmers in Western Utter Pradesh region. Though the credit availment was higher there were only 21 per cent of farmers who owned KCC rest 79 per cent without KCC. As majority of farmers preferred marginal loans, motivating farmers to KCC would help them in a better way.

A study conducted in Western Uttar Pradesh highlighted the average cost of cultivation of different crops like onion, potato, sugarcane, fodder, wheat etc., was found higher for potato (₹37,259 ha^{-1}) sequenced by sugarcane (₹30,418 ha^{-1}) and onion (₹23,730 ha^{-1}) (Singh *et al.*, 2008).

Mahesh (2009) used discriminant analysis to discriminate between KCC holders and non-holders in the study area of Ramanagaram district. Accordingly percentage contribution of each variable to the total distance measure was found. The results obtained showed that the education was important variable which would affect the values of the model (32.50 per cent) followed by age of family head (26.73 per cent).

Nargaven (2010) has conducted study on the farmers belonging to tribal group in Umaria district of M.P. The results showed that about 15 per cent of farmers had a very good contact with the developmental agencies, only 15 per cent of the total respondents practiced agriculture alone as their source of income, 13.33 per cent of farmers had a complete personal experience in the utilization of credit, risk orientation was high in 24.1 per cent of farmers and finally 17.5 per cent of the beneficiaries were utilizing the KCC to the full potential. Some of the constraints faced by the tribal beneficiaries are lack of government agencies to provide adequate information in the nearby villages, unavailability of electricity

and irrigation at the most needed times and finally lack of marketing and storage facilities.

The growth of KCC holders showed inter district variations ranging from positive to negative growth in Karnataka . The total cost of credit as percentage of borrowed amount was higher in the non-Kisan card category as compared to that in the KCC category. It was also evident that the credit given by the bank for food crops was less as compared to that of cash crops (Sajane *et al.*, 2011).

Sajane (2010) conducted a study in Belagum district of Karnataka and Sangli district of Maharashtra came up with results stating, the expenditure involved in cultivating paddy and the net returns was higher in large farmers under KCC (₹29,823 ha^{-1} and ₹14,824 ha^{-1} respectively) compared to small and medium farmers under KCC. In case of potato the yield almost similar for both KCC and non-KCC farmers (67.99 q. and 66.86 q. respectively). When it comes to expenditure the large farmers under both groups had incurred higher cost (₹58,456 ha^{-1} and ₹58,212 ha^{-1} respectively). In case of jowar cultivation the higher cost was incured by non-KCC category than the KCC category (₹20,003 ha^{-1} and ₹19,794 ha^{-1} respectively).

Sekhon (2010) says there is no association between the age, education, family type and size of land holding with the repayment behaviour of the beneficiaries in the Betul district of Madhya Pradesh. The annual income alone has greater association with the repayment behaviour of the beneficiaries depicting that 73.46 per cent of the respondents were defaulters as their income was low and 42.10 per cent of the respondents were repaying the loan regularly as their income was high.

A study by Annaporani and Gandhimathi (2011) showed that the major constraint of the regional inequality in disbursement of the credit under the scheme was the gross cropped area in the 16 states of India under study. It was also found that the rate of growth of amount sanctioned in the study area was lower when compared to the rate of growth of the number of cards issued. Based

on the study they have also suggested that expansion of loan repayment period to five years in the case of short term loans would help the farmers in a better way.

Barik (2011) projected the requirements of the crop and non-crop needs of farmers under the KCC to reduce the inadequacy of credit at all India level. He also showed the existence of positive relationship of KCC with the land, household size and the education level of the farmers. Also stressed on the cost of credit under KCC which was much lower. The study revealed, there was an increase in the yield of crops by the beneficiaries because of the use of adequate use of fertilizers, irrigation, manures, labour, pesticides etc. The main advantage of this scheme was, that the farmers received the loan amount in the form of cash without any upper ceiling on the amount of cash disbursed.

Dawar (2011) in his study reported that out of total 110 respondents only 24.55 per cent of respondents were able to obtain the credit easily whereas 26.36 per cent of the respondents found it difficult to obtain the credit and 49.09 per cent of the respondents found it very hard to obtain the credit. It was also found that only 31.82 per cent of the respondents were regular at the repayment of the credit and 21.82 per cent of the respondents did not show any interest in the repayment of the credit, remaining 46.36 per cent of the respondents were irregular in their repayment in Thikari block of Barwani district of Madhya Pradesh.

Some of the quantitative variables like farm size, education and main occupation have a positive and significant effect on the performance of the KCC in Haryana. The results have shown that education has played a key role in accessing and seeking better information for the complete utilization of the scheme (Kumar *et al.*,2011).

The performance of KCC in the commercial banks is superior than the RRB's and co-operative banks. The reason for the poor performance of these banks may be the lack of proper infrastructure facilities which in turn is creating a problem in providing credit facilities. It was also found that the beneficiaries were

satisfied with the KCC scheme and the amount that is provided under this scheme at all India level (Malpadri and Sirisha, 2011).

Rajnikant (2011) through his study in Anand district of Gujarat said that the age played an important role in adoption of KCC as he found majority of the non-KCC holders were old aged (58.33 per cent). When education was taken into account it was found about 69.44 per cent of KCC farmers were literates while the literates level was 36.11 per cent in case of non-card holders. The gross returns per hectare was higher in KCC farmers as that with the non-KCC farmers. The KCC farmers also earn a higher returns on fixed farm resources compared to non-KCC farmers. The utilization pattern showed about 55.56 per cent of borrowers partially utilized the loan, 37.50 per cent of borrowers fully utilized and only 6.94 per cent borrowers mis-utilized the loan.

The gross returns and net margins were found to be higher for KCC beneficiary than the non-KCC beneficiaries in Bihar. The factors influencing the adoption of KCC scheme and constraints perceived by the farmers have been identified, some measures were also suggested to attract more farmers towards the scheme (Bista *et al.*, 2012).

The cost of cultivation of paddy, maize, wheat and potato was found to be higher for KCC beneficiaries when compared to the non-beneficiaries. The reason was beneficiaries could obtain more credit which made them to invest more on the purchase of the needed inputs to obtain a higher yield. Hence the income of the beneficiaries was found to be higher than non-beneficiaries for the all crops under consideration in Bihar (Bista *et al.*, 2012).

Dhanabhakyam and Malarvizhi (2012) conducted a study in Coimbatore taking Canara bank as the KCC issuing agency. The results revealed that the variable sex donot have any influence on the borrowing of credit, it also showed that 95 per cent of the beneficiaries were satisfied with the timely availability of the credit. Around 43 per cent of the farmers were given awareness of the scheme through the agricultural offices and only 23 per cent of the farmers were informed

about the scheme through the bank. Finally the farmers of Coimbatore district were well aware of the scheme and are utilizing the scheme to the maximum possible extent.

Pandey (2012) stated that only 4 per cent of rural households belonging to agriculture participated in the scheme. It also showed that 10.5 per cent of KCC beneficiaries were poor at all India level. The farmers joining KCC also depends the level of community participation. The econometric results indicated that likelihood of farmers participation. In KCC increases with higher land holding but it weaken at higher level of land owning. The author concluded that development of rural infrastructure with special reference to the information technology will lead to increase in the number of participants in the KCC.

Parwate *et al.* (2012) found that among the 16 independent variables taken under study only 4 variables showed positive correlation in the study area Raipur district of Chhattisgarh. They also showed the percentage of overall utilization gap of the scheme among the different groups of farmers which was 32.96 per cent and the overall utilization gap was found to be 30.40 per cent and only 1.66 per cent of the respondents completely utilized the loan amount for the purpose for which it was taken and cent percent respondents showed the low level of utilization for the identification of purposes.

Basha (2013) stated the importance of KCC, features of KCC, procedure involved in availing the credit, advantages and disadvantages of the scheme, adequacy of the credit and role of banks in sanctioning of the credit.

Gole (2013) categorized KCC holders into three income groups viz., low (upto ₹50,000), medium (₹50,001 to 1,00,000) and high (above ₹1,00,000). The results of the study indicated majority of farmers fall into medium income group (36.67 per cent) followed by high income (32.50 per cent) and low income (30.83 per cent). The results also highlighted the low contact of the farmers with the extension agencies (37.50 per cent), 32.50 per cent farmers had medium contact

and only 30 per cent of farmers had a very high contact with the extension agencies in Jabalpur district of Madhya Pradesh.

Kumari and Mahto (2013) described the end use of credit through KCC at all India level. They found that majority of the farmers used their initial withdrawals of the credit to the farming activities later on they have used it as working capital and also few farmers have used it for consumption purpose. The farmers on a whole agreed it as a good credit product because of timely availability of credit, hassle free credit, adequate credit, savings in the interest burden, saving in cost, reduction in the cost of accessing the credit, freedom to repay and drawing cash at any branch in the district using Kisan Card.

Meena (2013) in her study in Rajasthan found that the increase in income by 25 to 30 per cent to the KCC holders as compared with the non-KCC holders. The difference in income for the large farmers was found to be 20 per cent, for small farmers it was 31.69 per cent and for the marginal farmers it was 29.86 per cent. The credit was adequate for KCC holders (55 per cent) but for the non-holders it was 61.67 per cent. Timeliness of credit is more for KCC holders (81.67 per cent).

Results of the study conducted in the Kaurali district of Rajasthan implied the farmers were satisfied with the timely availability of and adequacy of the credit under the KCC. Majority of the farmers (61.67 per cent) felt the rate of interest was higher under the scheme. It highlighted the reduced paper work of bankers in terms of documentation and loan issuing procedure. To make it more farmers friendly some of the banks have allowed farmers to withdraw the sanctioned amount from any of the bank branch in which the farmer has applied for the scheme (Meena and Reddy, 2013).

Patra and Sahu (2013) has stated that the usage of credit under KCC has led to increase in the productivity of paddy to 13.3 per cent in Odisha. They have also showed the number of new applicants under KCC is increasing every year because of its flexibility in availing the credit, repayment and also a coverage

under National Agricultural Insurance Scheme (NAIS) which acts as a safety measure for the farmers against unfavourable conditions.

Prakash (2013) conducted a study in Krishnagiri district of Tamil Nadu where he found that the cropping intensity was 223.11 per cent among the KCC beneficiaries compared to the non-beneficiaries (206.6 per cent). It was also found that per year transaction cost was higher to the non-beneficiaries when compared to beneficiaries. The result also depicted that beneficiary farmers in the region recorded higher yield in the Kharif by growing groundnut, paddy and sugarcane and in rabi also they recorded higher yield when compared to the non-beneficiaries. There was an under utilization of inputs as the MVP of all the inputs was higher than its price.

The cost of cultivation of paddy, sugarcane and groundnut was found to higher among the beneficiaries when compared to non-beneficiaries in Krishnagiri district of Tamil Nadu. The expenditure incurred for paddy by beneficiaries was ₹31,225 as compared to ₹24,222 by the non-beneficiaries. In case of sugarcane it was found to be ₹54,184 for the beneficiaries and ₹48,313 for non-beneficiaries. Lastly for groundnut ₹24,663 was incurred by beneficiaries and ₹21,922 by the non-beneficiaries (Prakash, 2013).

The impact of KCC was measured in terms of monetary gains among the beneficiaries, as they invested the borrowed amount under this scheme for enhancing their production through strengthening their technology, resources and risk bearing ability. KCC beneficiaries were using their credit for high quality inputs and minor implements and a few beneficiaries purchasing heavy machinery in Sehore district of Madhya Pradesh. Regarding repayment, majority of the beneficiaries were regular and a few of the beneficiaries were defaulters. This shows that attitude of beneficiaries was satisfactory towards KCC scheme (Sharma et al., 2013).

Sharma et al. (2013) reported that in Sehore district of Madhya Pradesh there was an increase in the productivity of the crops (soybean, arhar, wheat and

grams) and also the increase in the income by the use of funds borrowed through KCC. The absolute change, relative change and the yield before and after availing loan under KCC was calculated. The results depicted the increase in yield of soybean from 5.88 q ha^{-1} to 7.81 q ha^{-1}. In case of arhar it was found to be 3.74q ha^{-1} to 5.65q ha^{-1}, wheat showed a greater increase in the yield before and after availing loan (6.41 q ha^{-1} to 11.69 q ha^{-1} respectively) and gram showed and increase from 3.43q ha^{-1} to 5.98q ha^{-1}.

It was found that the credit sanctioned for both KCC and non-KCC holders was inadequate for the cultivation of sugarcane crop in the state of Maharashtra. Credit gap accounted to 0.19 per cent of the average percentage of the credit for KCC holders and 0.30 per cent for the non-KCC holders. The authors concluded that for every hundred rupee borrowed under KCC the rate of interest was very less as compared to the non-KCC holders (Bindage *et al.*, 2014).

The study reviewed that Government of India in the year 2006-07 has announced the interest subvention scheme for the short term loan component to the farmers, thereby encouraging the farmers to store their produce in warehouses at the same rate of interest instead of undergoing distress sales during the post harvest season. The scheme also enabled the farmers to purchase the quality inputs such as the seeds, fertilizers, pesticides etc. (Junnaykar and Daga, 2014).

Sirisha (2014) from her study concluded that the net returns and the total yield obtained by growing paddy, cotton, chilly and turmeric were highest in the KCC category compared with the non-KCC holders, as they would have access to timely credit thereby purchasing all the necessary inputs in adequate quantity and quality. It was also found that the educated farmers made the best utilization of benefits of KCC in Guntur district of Andhra Pradesh. The KCC holders also possessed larger assets in the form of farm machineries, implements and livestock when compared to the non-KCC holders.

The study conducted in Guntur district of Andhra Pradesh by Sirisha (2014) highlighted the difference in the cost involved in production of paddy and

the yield obtained. It says that the beneficiaries obtained an yield of 52.52 q ha^{-1} with an expenditure of ₹13,207 ha^{-1} when compared with the non-beneficiaries obtaining an yield of 47.22 q ha^{-1} incurring a cost of ₹11,414 ha^{-1}.

The efficiency of KCC had been estimated by two approaches (a) cost of credit approach, (b) number of KCC cards renewed. The study conducted in Karnataka revealed that the cost as percentage of loan amount was higher in borrowing from commercial banks than from co-operative banks. There was not much difference in the number of KCC's renewed and the percentage of recovered amount in both the financial institutions (Jainuddin *et al.*, 2014).

Kumar and Singh (2015) revealed that beneficiaries of KCC used the amount sanctioned for the purchase of quality inputs like the high yielding variety seeds, fertilizers, agricultural equipments and some farm machineries. They have also projected that there was an increase in the yield and income of the beneficiaries in Hamirpur district of Himachal Pradesh.

Samantra (2015) in his study during the period of 2000-2010 at all India level found a consistent increase in the average agricultural productivity with a growth of 2.34 per cent per annum. It was also found that the increase in the average KCC loans was not as much compared to the agricultural productivity. β convergence results showed that the districts with low KCC loans grew faster at a rate 2 per cent while the district with high KCC loans grew at a rate of 1 per cent which indicated the presence of strong (β) convergence across them. The convergence speed remained the same during 2000-2005 to 2005-2010. The p-values dropped significantly in 2000-2005 and 2005-2010 from 1.46 per cent and 1.20 per cent respectively.

The cost of three inputs for basmati rice viz. seeds, labour and machinery had a significant difference between the farms of KCC and non-KCC beneficiaries. The total cost of basmati rice after drawing and using credit under KCC increased by 26.3 per cent whereas the productivity and net profit to 5.78 and 116.79 per cent respectively. The result indicated that a significant

improvement in expenditure of input use, yield and profitability of basmati rice by the use of credit card under KCC scheme in RS Pura block of Jammu district (Dwevedi *et al.*, 2016).

A study by Thakur and Barman (2016) in Assam stated there were 11 reasons for the poor disbursement of credit under KCC some of them are lengthy paper work, poor recovery of loan, insufficient credit limit, lack of motivation from bank officials and lack of knowledge and awareness. They also stated that there were 12 reasons for the difficulty in the recovery of the credit and some of them are poor awareness, lack of follow up by bank officials, mis-utilization of loan, double financing and low repayment capacity. As Assam is blessed with a very good rainfall and a fertile crop cultivation best suits the area and because of poor disbursement of credit an recovery of the credit the government has taken up initiatives like farmers's group through which farmer's are encouraged to take up KCC and obtain its benefits.

A study conducted in Jammu and Kashmir revealed that majority of the beneficiaries were unaware about the renewal procedure of KCC and also the rate of interest at which they are availing the credit. It also showed that about 60 per cent of unemployment rate was reduced as there was a strong relation between the unemployment rate and KCC. The introduction of the scheme led to abolition of 70.8 per cent of the margin money which the farmers would have lost to the money lenders thereby creating self-reliance among the farmers (Ganaie and Rupavath, 2017).

Khaparde and Jahanara (2017) showed that about 51.67 per cent of the farmers had less knowledge about the scheme in Gariabad district of Chattissgarh. They also found that 80 per cent respondents under study had partially utilized the credit sanctioned under the scheme, about 26 per cent of farmers had only primary education, the source of information regarding the scheme was low to 45.83 percent of the respondents, most importantly 40 per cent of the KCC holders in the study area were small farmers. Finally it was found that the perception of

farmers to own KCC was found to be more in the middle age group (57.50 per cent).

Rameshkumar and Alexpandi (2017) showed that there was inadequacy of credit under the scheme which led the farmers to approach the money lenders to obtain credit for the cultivation purpose as the credit needs are not met by the scheme. The farmers were prompt at the repayment of their loan and hence there were no defaulters in the repayment of loans in Sivagangai talku in Tamil Nadu.

The study of KCC in Rajasthan indicated that the amount per account was very lower which might hinder the farmers to enter the scheme. But the results showed the gross returns and the net margins was higher to beneficiaries compared with the non-beneficiaries. It also stated that it varied across the regions and with the institutional agencies. Among the institutional agencies the RRB's and the commercial banks were found to have positive relation with the amount per account opened whereas the co-operative banks were found to have a negative relationship (Shrotriya and Yadav, 2017).

Material and Methods

3. MATERIALS AND METHODS

In order to make meaningful conclusions from the data, selection of appropriate tools and methods plays a significant role. In this section the method involved in the collection of data and the tools used for analysis are discussed based on the review of literature in the following sections.

3.1 Description of the study area

3.2 Source of data

3.3 Method of data collection

3.4 Variables and their measurement

3.5 Tools for analysis

3.1 DESCRIPTION OF THE STUDY AREA

Before the start of the analysis it is good to know about the description of the area under study. In this prospect some characters of the area like topography, climate and rainfall, soil types, land utilization pattern, land holding pattern, agriculture, major crops grown, demography, occupation and administration are discussed below.

3.1.1 Location

Kerala

Known as 'God's own country' is situated on the Malabar Coast of South India. The total area of the state is 38,863 km^2 which is bordered by Karnataka to the north and northeast, Tamil Nadu to east and south and the Lakshadweep Sea to the west. The population of the state is 33,387,677. Kerala has a wet and maritime tropical climate influenced by seasonal heavy rains of the southwest summer monsoon and northeast winter monsoon. The total number of rainy days is around 120-140 days per year with an average rainfall of 2,923 mm annually.

The mean daily temperature ranges from 19.8 ^{0}C to 36.7 ^{0}C. Agriculture and allied sectors contribute 15.73 per cent to the GDP of the state. The key crops grown are paddy, coconut, tea, coffee, rubber, cashew, black pepper, cardamom, vanilla and nutmeg. Political map of Kerala is given in fig 1.

3.1.2 Thiruvananthapuram – topography

It lies between 8.28^0 North latitude, 76.68^0 east longitude and 8.90^0 North latitude , 77.28^0 east longitude and 5 m altitude. The total area of the district is 2,189 sq km. The district is surrounded by Arabian sea on the west, on the north by Kollam district, Tirunelveli district of Tamil Nadu on east and Kanyakumari district of Tamil Nadu on the south. It is the fifth most populous urban cluster. Mahatma Gandhi called this city as 'Evergreen city of India'. As the city is characterised by undulating terrain of low coastal hills, it is classified as Tier – II city, by the government of India. Political map of Thiruvananthapuram is given in fig 2.

3.1.3 Neyyattinkara

It is a municipal town of Thiruvananthapuram which spreads over an area of 16.21 km^2 on the banks of Neyyar river. This taluk is the sub-urban of extended metropolitan region of Thiruvananthapuram and it is also a revenue division. The taluk lies 8^0 24$'$ North latitude and 77^0 05$'$ East longitude with an average elevation of 26 metres. The annual average precipitation is 3,100 mm. The average annual temperature will be 27.2 ^{0}C. The town is sandwiched between Western Ghats and the Arabian sea. The population of the taluk is 70,850 as of 2011 census. It is known for manufacture of three wheelers for cargo transport and in the neighbouring areas cottage industries and handlooms are more common. .

3.1.4 Parassala

Located on 8^0 26$'$ North latitude and 77^0 02$'$ East longitude Parassala town is at the southern end of Kerala bordering Tamil Nadu. The total population
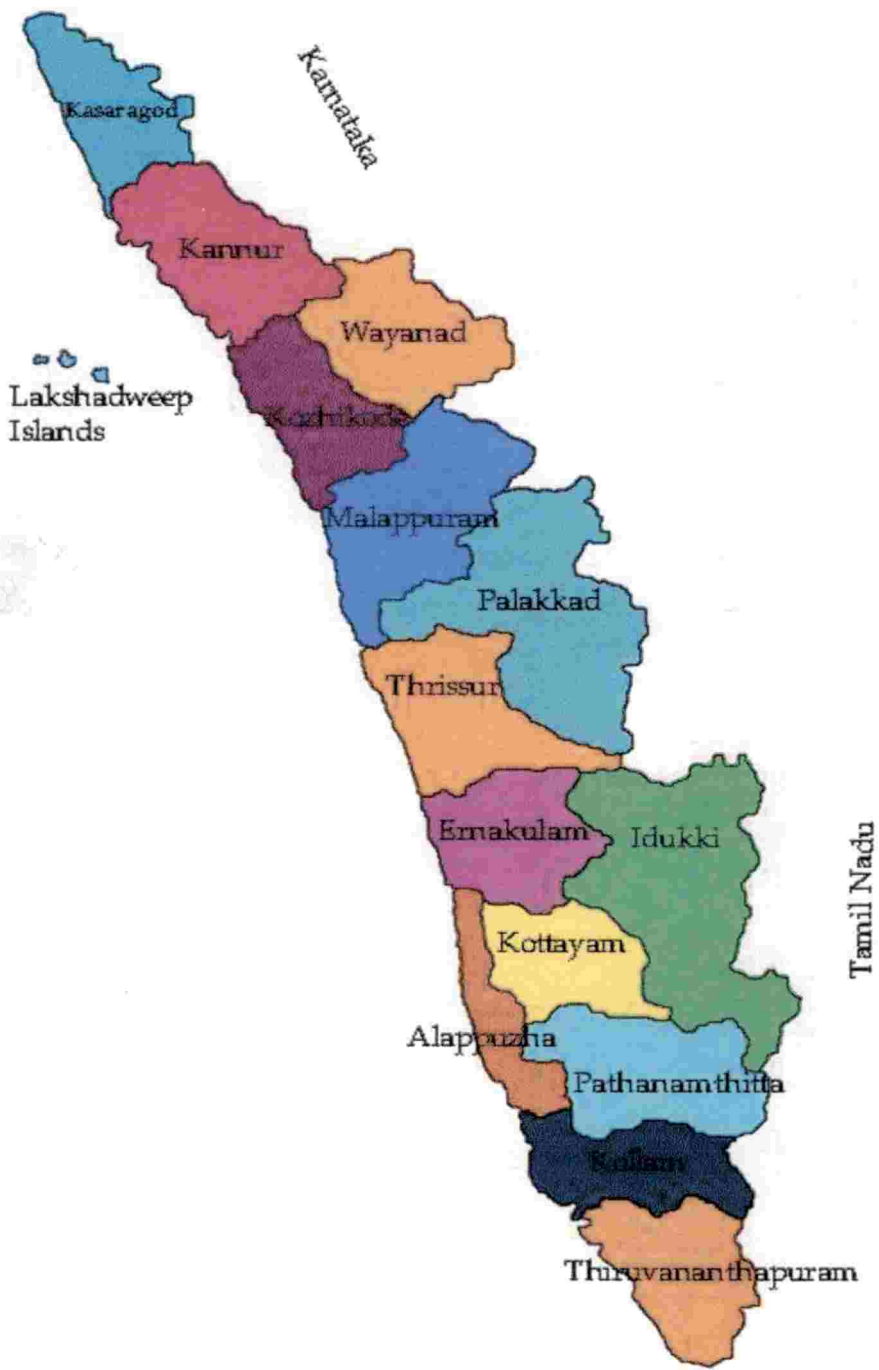
Figure 1. Political map Kerala state.

Figure 2. Political map of Thiruvananthapuram district
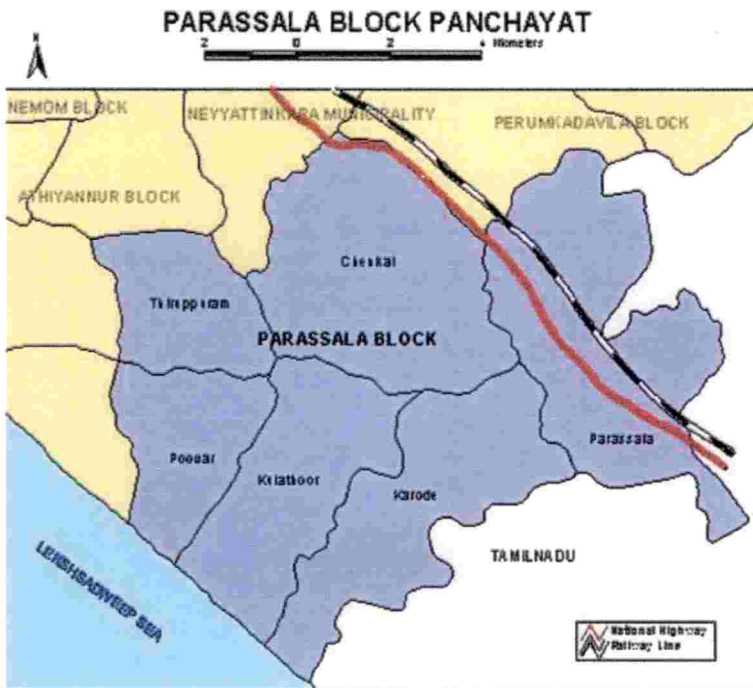
Figure 3. Political map of Parassala block

is 33,556 as of 2011 census. Annual average rainfall is 3,100 mm. The average maximum temperature will be 32 ^{0}C. The literacy rate is 82 per cent. There are 1417 persons who are completely dependent on agriculture as a source of income. The major crops grown are coconut, paddy, banana, tapioca, amaranthus, bhendi, cucumber, yardlong bean, snake gourd, bottle gourd and other minor crops are also cultivated. Political map of Parassala is given in fig 3

3.1.3 Climate and rainfall

It is blessed with two types of climate- tropical savanna climate and tropical monsoon climate. As a result humidity is high rises to 90% during monsoon. It receives the heavy rainfall of 1700 mm per year as it is the first city along the path of southwest monsoons in the early June. The mean maximum temperature of the city is 34 ^{0}C and the mean minimum temperature is 21 ^{0}C.

3.1.4 Soil types

In the middle part of the city dark brown loamy laterite soil which is high in phosphate sis found, on the western coastal region sandy loam soils are present and on eastern hilly part rich dark brown loam of granite origin id found.

3.1.5 Land utilization pattern

The total geographical area of the district is 2189 sq km. Forests accounts to 60.05 per cent of the total geographical area of the district. The net sown area is 58.6 per cent.

3.1.6 Agriculture

15 per cent of the total population of the district depends on agriculture for their livelihood. In the wetlands paddy is the major crop grown. In garden land crops like Coconut, rubber, banana and vegetables are cultivated. There is a scope for fisheries as there is 78 km stretch of coastal line, reservoirs and inland waters.

3.1.7 Demography

According to 2011 census the total population of Thiruvananthapuram was 957,730 in metropolis and the urban population was 1,687,406. It was also found that the sex ratio was higher than the national average which was 1,040 females for every 1,000 males. The literacy rate was 93.72 per cent which exceeds the all-India average of 74 per cent.

3.1.8 Administration

The district headquarter is situated in Thiruvanathapuram itself. It has four taluks – Thiruvananthapuram, Neyyattinkara, Nedumangad and Chirayinkeezhu. It also comprises of 31 towns and 68 villages. Thiruvananthapuram corporation comprises of three municipalities and 27 panchayats in the metropolitan area. It also possess two parliamentary constituencies- Attingal and Thiruvananthapuram.

3.2 SOURCE OF DATA

The study is based on both primary and secondary data. The micro level study was conducted in Thiruvananthapuram district. From this district one taluk was selected at random in the first stage and then one panchayat was selected at random. Neyyattinkara taluk and Parassala panchayat was selected for the micro level study.

3.2.1 Primary Data

For the micro level study, major commercial and co-operative bank serving the locality was selected i.e. State Bank of India and Thiruvananthapuram Co-operative Bank respectively. Then the list of farmers possessing KCC was obtained from these banks and the respondents were selected at random from the list. From State Bank of India bank 15 beneficiary farmers and 15 non-beneficiary farmers were selected and in the same way 15 beneficiary farmers and 15 non-beneficiary farmers from Thiruvananthapuram Co-operative Bank was selected. Thus total sample size was 60 (15 beneficiaries each from both the banks and 15 non-beneficiaries each from both the banks).

3.2.2 Secondary Data

For the macro level study data pertaining to the number of KCC issued and the amount sanctioned for a period of 11 years was obtained for both all India level and Kerala state level. The data was obtained from State Level Bankers Committee reports of Kerala state and India stat website for all India level. As the data pertaining to district level was not available in the Lead bank of the district it was not taken for study.

3.2.3 Sampling frame

Thiruvananthapuram district

↓

Neyyattinkara taluk

↓

Parassala panchayat

↓

Commercial bank   Co-operative bank

15 beneficiaries   15 non-beneficiaries   15 beneficiaries   15 non-beneficiaries
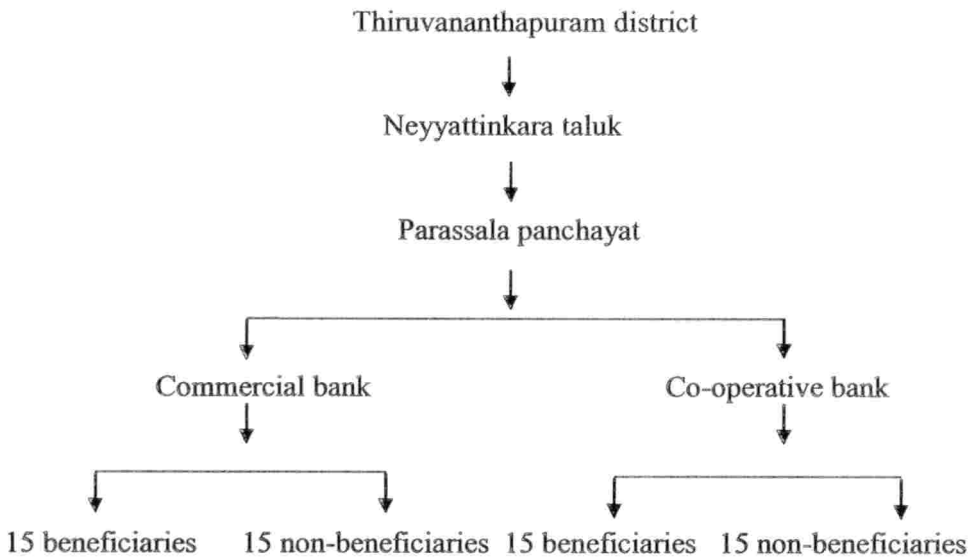
The non-beneficiaries are those respondents who are not availing any kind of credit under KCC but are availing other kinds of agricultural credit like the general agricultural credit and agri-gold loans from the banking institutions.

3.3 METHOD OF DATA COLLECTION

The data was collected by personally interviewing the respondents using a pretested structured interview schedule. The information related to the crops cultivated by the respondents, yield details of different crops grown, costs and returns involved in the cultivation, procedure involved in availing the credit, mode of repayment, frequency of repayment and the constraints faced by the beneficiaries in availing the credit was collected.

3.4 VARIABLES AND THEIR MEASUREMENT

3.4.1 Cost of Seeds

The seed material used for the production may be the farm produced seed material or the purchased seed material. In case of purchased seed material we consider the market price. In case of farm produced seed material then it is valued at market price.

3.4.2 Cost of Manures and Fertilizers

If the farmers are producing the needed quantity of manures on their own then the price of it is evaluated at purchase rate. The cost incurred in the purchase of fertilizers and non-farm manures will be calculated at market price prevailing in that locality.

3.4.3 Cost of Plant Protection Chemicals

In order to reduce the loss of yield by the pests and diseases, farmers purchase the pesticides, insecticides and fungicides. The cost of these are valuated at the market price.

3.4.4 Cost of Labour

3.4.4.1 Cost of Family Labour

Some farmers make use of the family members for carrying out the farm operations. Hence the cost involved using family labour is calculated at the wage rate paid to the hired labour in that locality.

3.4.4.2 Cost of Hired Labour

It mainly refers to the wages that is actually paid to the work rendered by them in the farm. The wage rate for men is ₹700 and the wage rate for women ₹650 in the locality.

3.4.4.3 Machine Labour

It involves the cost incurred in the maintenance of the machineries by employing some workers to carry the maintenance work of the machines. It includes fuel, power, lubricants, repair and other expenses which are included under the annual maintenance and repairs. Use of straight line method helps to find the depreciation of the machinery. In this study machine labour was not used as the respondents didn't own any machine for carrying out farm operations.

3.4.5 Land Revenue

This is the actual rate that is paid by the farmers to the revenue department for the land they possess. The revenue paid by farmers in the locality was ₹80 per acre per year.

3.4.6 Interest on Working Capital

Working capital refers to paid out cost. As the farmers go for year round cultivation they need more of working capital. So they borrow from the banking institutions in the form of crop loans which is provided at the rate of 7 per cent under the KCC scheme. Hence the interest on the working capital was worked out 7 per cent per annum.

3.4.7 Interest on Fixed Capital

Fixed capital refers to the assets that the farmers possess excluding land. It was calculated 11 per cent per annum as the long term loans are provided at this rate in the banking institutions.

3.4.8 Rental Value of the Leased in Land

It is the rent paid to the leased land. The farmers cultivate the crops throughout the year, so rental value of the leased in land was calculated as the rent paid per year.

3.4.9 Rental Value of Owned Land

It is computed by taking the rent of land prevalent in the locality.

3.4.10 Depreciation

Straight line method was used to calculate annual rate of depreciation of each of the machinery and implements, then the total depreciation allowance was calculated by aggregating.

3.4.11 Miscellaneous Expenses

These include costs such as the transportation of manures and fertilizers, rent of sprayers and purchase of small accessories like basket, gunny bags etc.

3.5 TOOLS FOR ANALYSIS

Appropriate statistical tools were used to process the collected data and to get meaningful conclusion. The tools used are as follows

3.5.1 Compound Annual Growth Rate

It was used for the secondary data collected which consisted of numbers of KCC issued and the amount sanctioned for period of ten years by both commercial banks and the co-operative banks at all India level and Kerala state level. It was performed to know the annual growth in trend of the number of KCC's issued and the amount sanctioned. It was calculated using the formula:

$Y = ab^t e_t$

The estimable form of the equation is

$\ln y = a + t \ln b + e_t$

Where,

Y = growth rate in the number of cards issued and amount sanctioned

a = intercept

b = regression co-efficient

t = time variable

e = error term

3.5.2 Percentages and Averages

It was mainly used to examine the socio-economic characteristics of the respondents viz., age, education, income, gender, size of family, land holding and cropping pattern.

3.5.3 Binary Logit Regression

Binary logit regression is used when the dependent variable possess a binary response. It was used to study the socio-economic factors influencing the adoption of KCC scheme. This was worked out using STATA package. The model is as follows

$P_i = E\ (Y= 1\mid X_i) = \beta_0 + \beta_1 X_i$

Where   P = probability of Y occurring (Here Y=1 for KCC and Y=0 for Non-KCC)

$P_i = \dfrac{e^z}{1+e^z}$

(Gujarati, 2004)

Where

$Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8$

e = natural logarithm base

β_0 = interception at y-axis

X_1 = cropping pattern (code)

X_2 = Area (ha)

X_3 = yield (ha^{-1})

X_4 = Income (₹)

X_5 = Expenditure (₹)

X_6 = Age (years)

X_7 = Education (code)

X_8 = Number of family members

β_1........β_8 = coefficients of X_1........X_8

Odds ratio (OR) : It represents the odds that an outcome will occur again given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure.

Interpretation of odds ratio: When logistic regression is performed, the exponent of regression coefficient is named as odds ratio associated with a one unit increase in the exposure.

Odds ratio = e^b

OR = 1 indicates exposure does not affect odds of outcome.

OR<1 indicates exposure associated with lower odds of outcome.

OR >1 indicates exposure associated with higher odds of outcome.

(Szumilas, 2010)

3.5.4 Annual Cost of Maintenance (Cost of Cultivation)

Cost of cultivation was worked out as the sum total of cost incurred on various inputs that are used in the production of the commodity. In this study ABC cost concepts were used to workout the cost of cultivation.

3.5.4.1 Cost Concepts

Cost A_1 includes

1. Cost of hired labour
2. Cost of manures, fertilizers and soil ameliorants and micro nutrients
3. Cost of plant protection chemicals
4. Land revenue
5. Depreciation
6. Maintenance cost of equipment and machineries
7. Interest on working capital
8. Miscellaneous

Cost A_2

Includes the sum of Cost A_1 and rental value of leased in land

Cost B

Includes the sum of Cost A_2 and rental value of owned land and interest on owned fixed capital excluding land.

Cost C

Includes the sum of Cost B and imputed value of family labour

(CSO, 2008)

3.5.5 Resource Use Efficiency

Cobb-Douglas production function was used to find the resource use efficiency of the various resources used in the production process by KCC beneficiaries and non beneficiaries. This was carried out in order to know how the beneficiaries are allocating the resources that they possess and the allocation of resources by the non-beneficiaries, so that we can say who is allocating the resource more efficiently.

The Cobb-Douglas production function is given by:

$$Y = aX_1^{b_1} X_2^{b_2} X_3^{b_3} X_4^{b_4} \, e^n$$

This is modified into a log linear model by application of logarithm.

$\ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + u$

where, Y= Yield (kg ha^{-1}).

X_1 = Quantity of hired labour (ha^{-1})

X_2 = Quantity of family labour (ha^{-1}).

X_3 = Quantity of fertilizers and manures (ha^{-1}).

X_4 = Quantity of plant protection chemicals (ha^{-1}).

a = Intercept

$b_1 \ldots b_4$ = Regression coefficients of explanatory variables.

e^n = Stochastic error term

The Cobb-Douglas production function was estimated by using OLS method assuming the error term (e) to be independently and normally distributed.

3.5.6 Estimation of Marginal products and Marginal Value Products

In this study marginal product (MP) and marginal value product (MVP) were also calculated by comparing MVP of each resource with the marginal factor cost (MFC).

The marginal products were calculated at geometric mean levels of variables by using following formula

Marginal product of input $(MP_i) = b_i \times \dfrac{\bar{Y}}{\bar{X}_i}$

Where

$\bar{Y}$ = geometric mean of output

$\bar{X}_i$ = geometric mean of ith independent variable

b_i = the regression coefficient of the ith independent variable

The formula used for calculating MVP was

Marginal value productivity of $X_i = b_i\, P_Y\, \dfrac{\bar{Y}}{\bar{X}_i} = P_Y \times MP_i$

Where

P_Y = price of crops grown by the respondents

The comparison of ratios (MVP/MFC = k) for judging the efficiencies are

k > 1 indicating under use or sub optimal use of resources

k = 1 optimum use of resources (allocative efficiency)

k < 1 indicating excess use of resources.

3.5.7 Credit requirement of the respondents

The ordinary least square estimate was applied to analyse the variables affecting the total credit requirement of the respondents.

The functional form of the model is as follows

$$Y = f(X_1, X_2, X_3, X_4)$$

Where Y = Credit requirement of all the respondents is accounted by taking the amount of loan applied by the respondents for various kinds of loans.

X_1 = Cost of cultivation of the crops grown by the respondents

X_2 = Consumption loan taken by the respondents

X_3 = Loan for non-farming operations includes the vehicle loan and hosing loan taken by the respondents

X_4 = Loan for farming operations includes the agricultural loans

By taking log-linear function, the model becomes

$$\log Y = \log a + b_1 \log X_1 + b_2 \log X_2 + b_3 \log X_3 + b_4 \log X_4 + u$$

Where

a = Intercept

$b_1 \ldots b_4$ = Regression coefficients of explanatory variables.

u = Stochastic error term

Results and Discussion

4. RESULTS AND DISCUSSION

Data collected from the survey was tabulated and analysed to draw meaningful conclusions. Results drawn from the analysis of the data collected were described and discussed in this chapter in detail under the following headings.

4.1 Progress of Kisan Credit Card Scheme.

4.2 Socio-economic status of respondents.

4.3 Economics of crops grown by the respondents.

4.4 Features and characteristics of KCC holders and non-KCC holders.

4.5 Adequacy of credit under KCC scheme.

4.6 Cost of credit to the KCC beneficiaries.

4.7 Credit requirement of the respondents.

4.8 Constraints faced by beneficiaries and suggestions to improve the scheme.

4.1 PROGRESS OF KISAN CREDIT CARD SCHEME

4.1.1 Progress KCC issued and amount sanctioned in India and Kerala

The progress of the KCC can be clearly understood by calculating the annual growth rate of the number of cards issued, the amount sanctioned and the amount per card issued by the banking sector as a whole, commercial banks and the co-operative banks in India and Kerala state. For this purpose compound annual growth rate was calculated for a period of 2005-15 for India and Kerala state using exponential growth model. The results were presented in Table 1.

Regarding the number of KCCs issued the rate of growth was 13.74 per cent per annum whereas the CAGR of that by commercial banks and co-operative banks were 15.87 and 11.71 per cent respectively in India. The share of number of

KCC issued by the various banking institutions did not show a regular pattern over the period of the study. Maximum share was observed for the commercial banks in 2009 (84.36 per cent) and by co-operative banks in 2008 (62.08 per cent). Agency wise pictorial representation of the cards issued during the period is given in fig 4. and fig 5. It is also noticed that commercial bank sector has issued more KCC as compared to co-operatives in most of the years except one or two years.

Table 1. Percentage share of cards issued and amount sanctioned by different banks in India during 2005-2015.

Year	No. of KCCs issued	% KCCs issued		Amount sanctioned in lakh (₹)	% Amount sanctioned	
	Total banking sector	Commercial banks	Co-operative banks	Total banking sector	Commercial banks	Co-operative banks
2005	47803050 (100)	43.12	56.88	3911800 (100)	48.01	51.99
2006	8012251 (100)	67.57	32.43	3911884 (100)	48.01	51.99
2007	67544938 (100)	50.76	49.24	20350688 (100)	43.38	56.61
2008	12144840 (100)	37.92	62.08	9841964.79 (100)	60.48	39.51
2009	8592473 (100)	84.36	15.64	4743673 (100)	82.23	17.76
2010	9006123 (100)	80.64	19.36	4754659 (100)	84.00	15.99
2011	10168577 (100)	72.35	27.65	6115676 (100)	82.47	17.52
2012	11757659 (100)	74.83	25.17	8016019 (100)	8672	13.27
2013	120337778 (100)	61.48	38.52	52702182 (100)	67.00	32.99
2014	101094187 (100)	64.62	35.38	49566756 (100)	67.32	32.67
2015	74094090 (100)	47.06	52.94	12479536.57 (100)	37.97	62.02
CAGR	13.74	15.87*	11.71*	18.48	20.88*	13.43*

* CAGR was calculated for the actual number of cards issued and amount sanctioned rather than for the percentages.

In the case of amount sanctioned a compound annual growth rate of 18.48 per cent was noticed at all India level, which is more than that rate of number of cards issued (13.74 per cent). CAGR on the amount sanctioned by Commercial banks and Co-operative banks was 20.88 and 13.43 per cent per annum respectively during the period 2005-15. The maximum share was reported from the commercial banks in the year 2012 (86.72 per cent) and co-operative banks in 2015 (62.02 per cent). The distribution of amount sanctioned under KCC of commercial banks and co-operative banks is given in fig 8. In the initial years more than 50 per cent of credit amount was distributed through co-operative banks, but in 2008 onwards commercial banks are playing the leading role.

The results are in conformity with findings the of Jampala *et al.* (2012) where commercial banks maintained the major share followed by co-operative banks in the number of KCC issued.

State level progress of KCC in Kerala was also calculated in a similar way and the results were presented in Table 2. The growth rate of the number of KCC issued by the total banking sector was 3.03 per cent per annum whereas the CAGR for commercial banks was 6.25 per cent but it was negative for co-operative banks to the extent of 1.44 per cent. State level average annual growth rate was much lower than the national level but the growth rate in amount sanctioned was more at state level and across banks. Bindage *et al.* (2014) reported that in the state of Maharashtra there was a growth of 7.74 per cent per annum for the KCC issued and there was a consistent growth in KCC issued during the period from 2000 to 2011.

The results of the analysis show that the number of cards issued by the co-operative banks is declining over the years with a maximum number reported from co-operative banks in 2010 (58.79 per cent) and from commercial banks in 2013 (70.80 per cent), whereas the minimum was reported from commercial banks in 2010 (41.20 per cent) and that from co-operative banks in 2013 (29.19
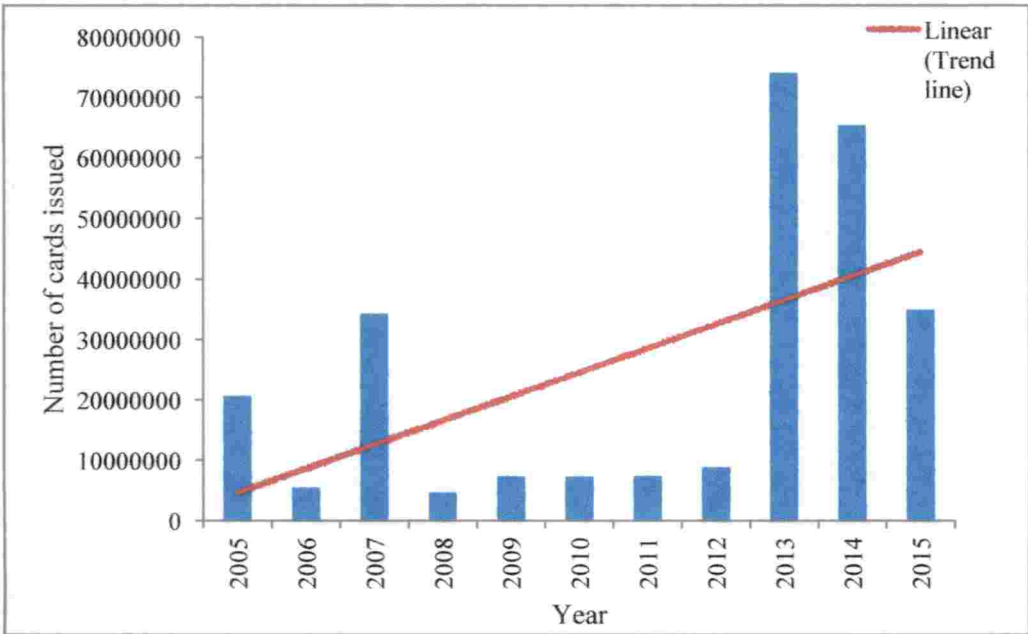
Figure 4. Number of cards issued by commercial banks in India
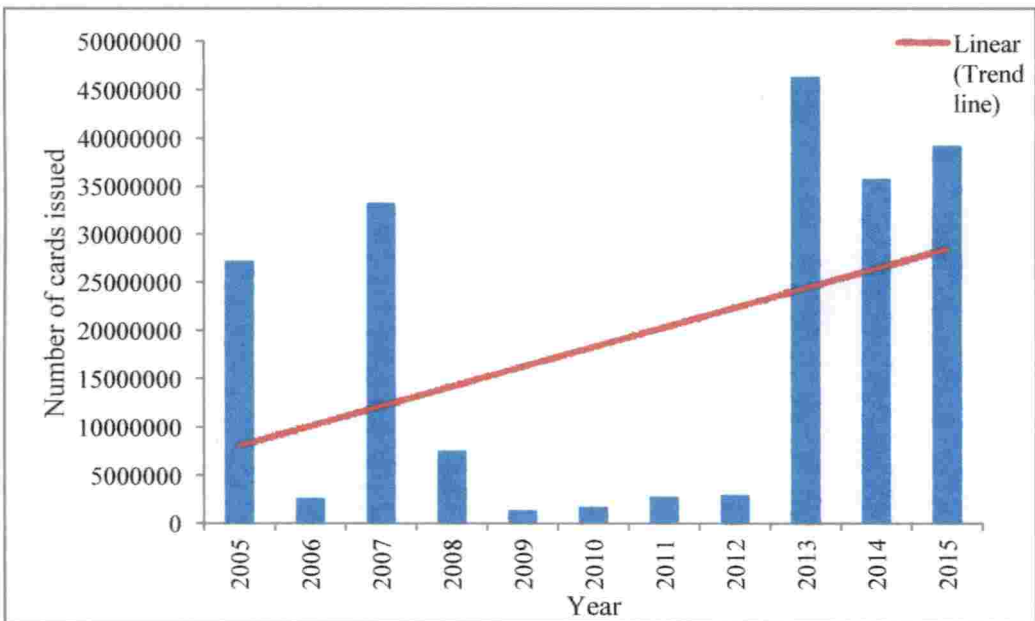
Figure 5. Number of cards issued by co-operative banks in India

per cent). A graphical representation of the number of cards issued by various banking institutions was given in fig 6. and fig 7.

Table 2. Percentage share of cards issued and amount sanctioned by different banks in Kerala during 2005-2015

Year	No. of KCCs issued	% KCCs issued		Amount sanctioned in lakh (₹)	% Amount sanctioned	
	Total banking sector	Commercial banks	Co-operative banks	Total banking sector	Commercial banks	Co-operative banks
2005	352991 (0.738)	54.04	45.95	104606.57 (2.674)	57.11	42.88
2006	354168 (4.420)	47.53	52.46	142591.03 (3.645)	62.72	37.28
2007	345621 (0.512)	50.03	49.97	151549.55 (0.744)	55.47	44.52
2008	329673 (2.715)	55.70	44.29	158861.49 (1.614)	73.57	26.42
2009	263893 (3.071)	65.82	34.18	161848.66 (3.411)	63.95	36.04
2010	302285 (3.356)	41.21	58.79	212073.21 (4.460)	54.04	45.95
2011	369836 (3.637)	52.87	47.13	374859.27 (6.129)	70.17	29.82
2012	384187 (3.268)	64.17	35.83	1124450.26 (14.027)	33.91	66.08
2013	384375 (0.319)	70.80	29.19	460285.34 (0.873)	82.65	17.35
2014	407082 (0.403)	66.61	33.39	487453.49 (0.983)	83.90	16.09
2015	503163 (0.679)	65.05	34.95	732664.02 (5.871)	83.94	16.05
CAGR	3.03	6.25*	-1.44*	22.96	26.16*	12.83*

Note: Numbers in parentheses below shows the percentage share of total banking sector from Kerala to the all India level.

* CAGR is calculated for the original number of cards issued and amount sanctioned rather than for the percentages.
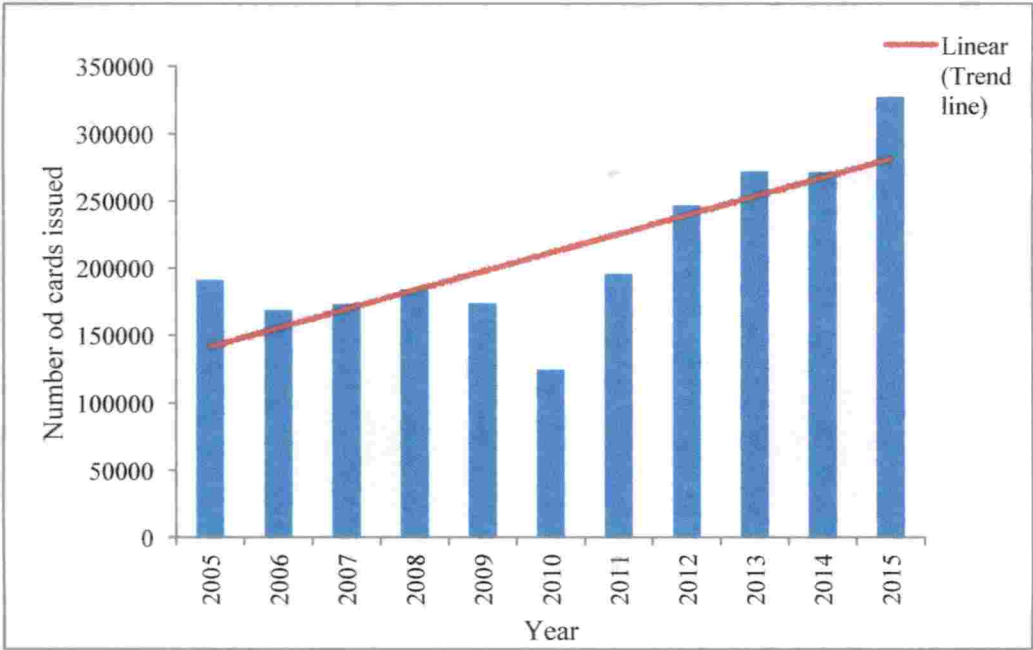
Figure 6. Number of cards issued by commercial banks in Kerala
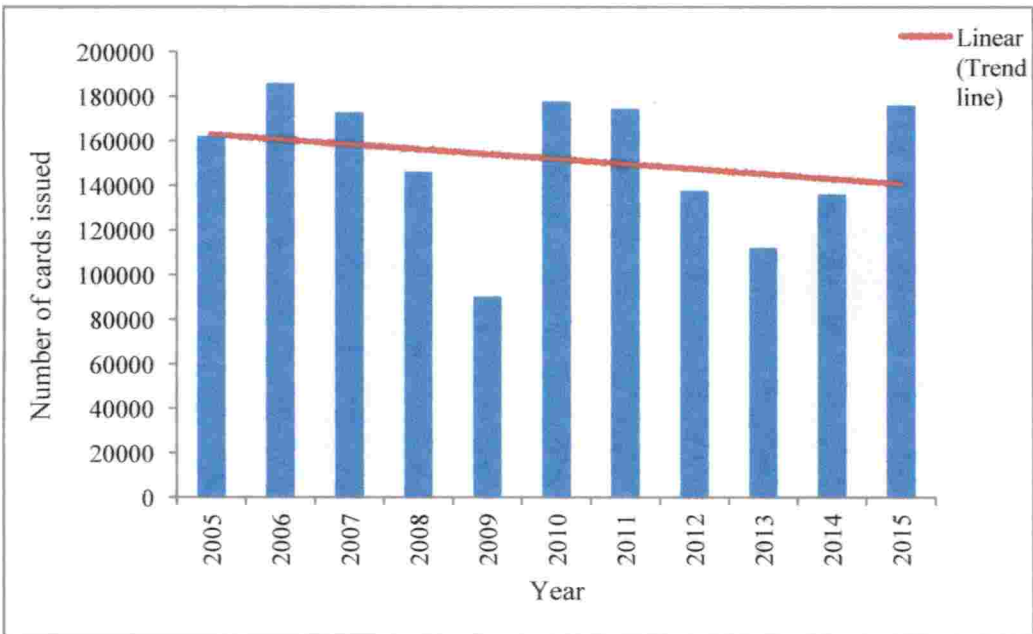
Figure 7. Number of cards issued by co-operative banks in Kerala

In case of amount sanctioned an increasing trend of 22.96 per cent was noticed which is very much higher than the growth rate of the number of cards issued (3.03 per cent). Amount sanctioned by the commercial banks was found to be growing at 26.16 per cent and that of co-operatives was 12.83 per cent. Maximum amount sanctioned by commercial banks in 2015 (83.94 per cent) and co-operatives in 2012 (66.08 per cent). An agency wise distribution of amount sanctioned under KCC in Kerala for the period of study is given in fig 9.

4.1.2 Amount per card sanctioned by the banks in Kerala and India

The percentage share of Kerala state to the number of cards issued at all India level by the whole banking sector was found to be maximum in 2006 (4.42 per cent) and the minimum in 2014 (0.403 per cent). In the case of amount sanctioned, the share of Kerala state was found to be maximum in 2012 (14.02 per cent) and minimum in 2007 (0.74 per cent). The percentage share of number of cards issued and amount sanctioned in Kerala with respect to all India is meagre. Hence suitable measures to be taken to enhance the distribution of number of cards issued and credit under it.

It is evident from the Table 3 that amount sanctioned per card at Kerala and at all India have shown a declining trend from 2012 onwards, but the overall growth rate was positive. A perusal of Table 3 revealed that, on the whole the total banking sector showed a growth rate at of 4.16 per cent and 19.33 per cent for India and Kerala state respectively which indicates a tendency of credit deepening in Kerala.

From the table it is clear that the performance of Kerala is better than that all India for both commercial banks and co-operative banks in terms of amount sanctioned per card.

A study by Sangitha (2007) revealed that, at Kerala state level the number of cards issued through Primary Agricultural Co-operative Societies was found to be 10,41,830 as on August 2006 and the amount disbursed as on March 2006 was found to be ₹1,02,579.4 lakhs.
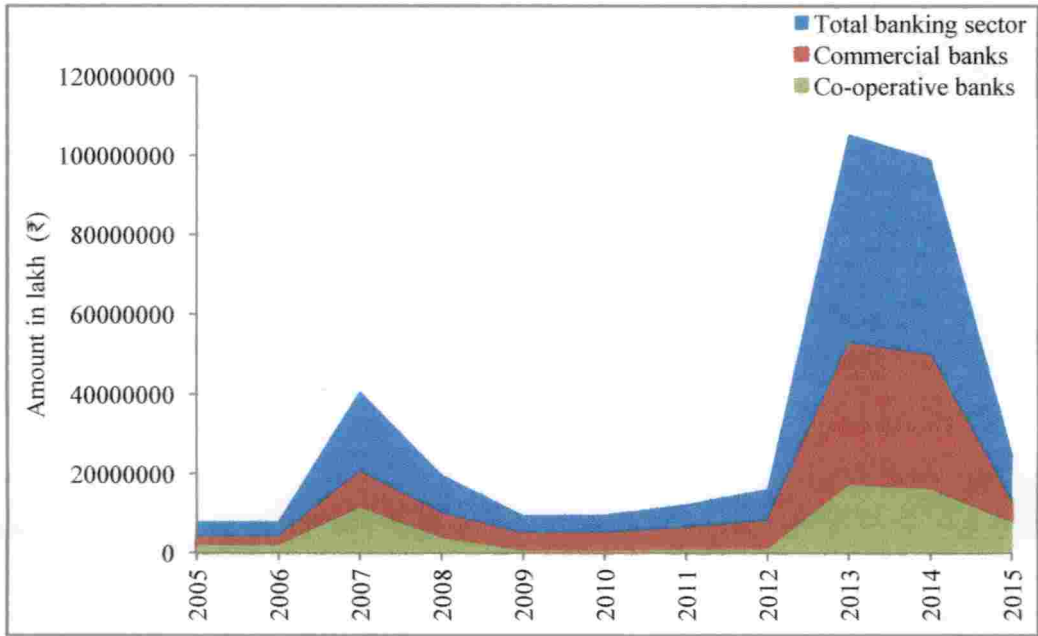
Figure 8. Total amount sanctioned under KCC at all India level
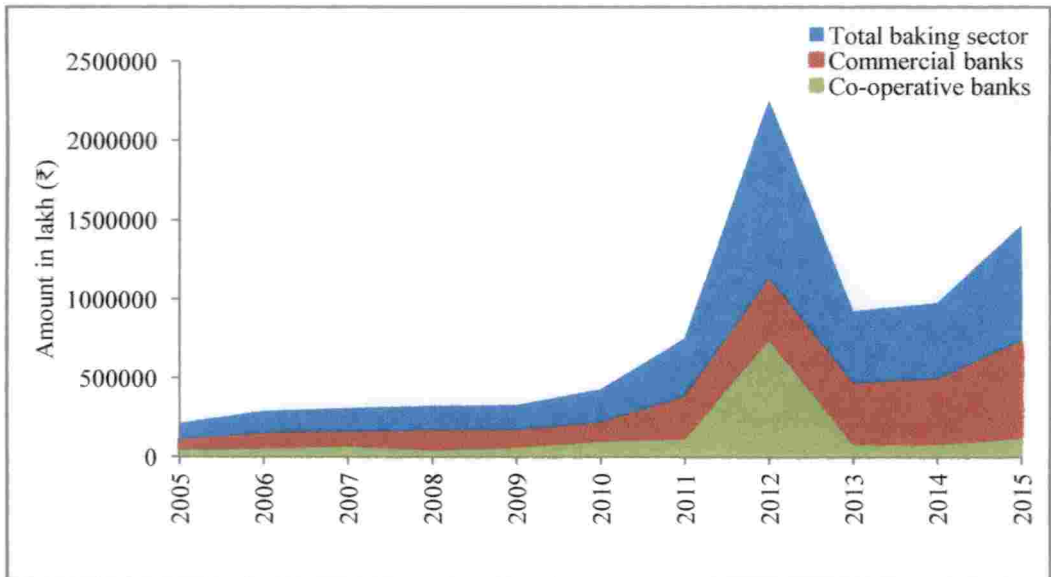
Figure 9. Total amount sanctioned under KCC at Kerala state level

Table 3. CAGR of amount sanctioned per card in India and Kerala (2005-15)

Particulars	Total banking sector (₹)		Commercial banks (₹)		Co-operative banks (₹)	
	Kerala	India	Kerala	India	Kerala	India
2005	29,630	8,180	31,300	9,110	27,600	7,480
2006	40,600	48,000	53,100	34,600	28,600	78,280
2007	43,800	30,100	48,600	25,700	39,100	34,640
2008	48,100	81,000	63,600	1,29,200	28,700	51,500
2009	61,300	55,200	59,500	53,800	64,600	62,700
2010	70,600	52,700	92,000	54,900	54,800	43,630
2011	1,01,000	60,100	1,34,500	68,500	64,100	38,100
2012	2,92,600	68,170	1,54,700	79,000	5,39,700	35,900
2013	1,19,700	43,790	1,39,700	47,700	71,100	37,500
2014	1,19,700	49,030	1,50,800	51,000	57,700	45,200
2015	1,45,600	16,840	1,87,900	13,500	66,800	19,700
CAGR	19.33	4.16	18.73	4.32	14.48	1.53

While analysing it can be seen that the banking sector as a whole the growth rate at all India level is lower than that of Kerala and the similar trend was observed in the commercial banks and co-operative banks at all India and Kerala level.

4.2 SOCIO ECONOMICS STATUS OF RESPONDENTS

From the primary data collected the socio economic status of farmers was analyzed. The distribution of respondents depending on age, gender, education, family size, occupational status, family expenditure pattern, land holding pattern, possession of livestock, crops grown by the respondents, the area under different crops and the income from different crops were considered. The results of the analysis is presented and discussed below.

4.2.1 Age

The distribution of respondents depending on age are classified into five groups as less than 30, 30-40, 40-50, 50-60 and more than 60 years of age and are presented in Table 4. The average age of beneficiaries was found to be 55.3 years and that of non-beneficiaries was 54.8 years. The overall average age of respondents was found to be 55.05 years. As many as 40 per cent of the beneficiaries fell under the age group of 50-60 years followed by 30 per cent of beneficiaries under age group of 50-60 years. In case of non-beneficiaries 43.3 per cent of the respondents were in the age group of 40-50 years followed by respondents under the age group of 50-60 years (30 per cent).

Table 4. Age-wise distribution of respondents

Particulars	<30 years	30-40 years	40-50 years	50-60 years	>60 years	Total	Average age
Beneficiaries	1 (3.33)	1 (3.33)	7 (23.33)	12 (40)	9 (30)	30 (100)	55.3
Non-beneficiaries	-	1 (3.33)	13 (43.33)	9 (30)	7 (23.33)	30 (100)	54.8
Total	1 (1.66)	2 (3.33)	20 (33.33)	21 (35)	16 (26.66)	60 (100)	55.05

Note: Figures in parentheses indicate percentage to total.

A similar study by Rajnikant (2011) showed, majority of the respondents having KCC were old aged. Another study by Sajane (2010) also reported that average age of borrowers under KCC was 46.73 years while it was found to be 44.88 years under non-KCC borrowers.

4.2.2 Gender

In the study area it was found that a total of 51 respondents were male constituting 85 per cent of the total and only 9 respondents were female constituting 15 per cent of total. The distribution of respondents based on gender presented in Table 5, revealed that among the beneficiaries 86.66 per cent were male and 13.33 per cent were only female. Almost similar distribution was observed in case of non-beneficiaries also 83.33 per cent were male and 16.66 per cent were female. Similar observation was also shown by Sangitha (2007).

Table 5. Gender wise distribution of respondents

Gender	Beneficiaries	Non-beneficiaries	Overall
Male	26 (86.66)	25 (83.33)	51 (85)
Female	4 (13.33)	5 (16.66)	9 (15)
Total	30 (100)	30 (100)	60 (100)

Note: Figures in parentheses indicate percentage to total.

4.2.3 Educational status

The educational status of the farmers is given in the Table 6 and classified under six classes as no schooling, upper primary, secondary, higher secondary, graduation and post graduation. It was evident that a total of 41.66 per cent of the respondents had a secondary education followed by 35 per cent of respondents had a higher secondary education. About 6 per cent of respondents did not have formal education. In case of beneficiaries 40 per cent had a higher secondary education followed by 33.3 respondents had secondary education and only 13.3 per cent of respondents had a graduation. In case of non-beneficiaries 50 per cent had a secondary education followed by 30 per cent with higher secondary education.

Table 6. Educational status of the respondents

Sl.no.	Educational status	Beneficiaries	Non-beneficiaries	Overall
1	No schooling	2 (6.66)	2 (6.66)	4 (6.66)
2	Upper primary	1 (3.33)	2 (6.66)	3 (5.00)
3	Secondary	10 (33.33)	15 (50.0)	25 (41.66)
4	Higher secondary	12 (40.00)	9 (30.00)	21 (35.00)
5	Graduation	4 (13.33)	2 (6.66)	6 (10.00)
6	Post graduation	1 (3.33)	-	1 (1.66)
7	Total	30 (50)	30 (50)	60 (100)

Note: Figures in parentheses indicate percentage to total.

In this context a study by Rajnikant (2011) showed education plays a major role in the perception of the scheme and among KCC holders about 69.44 per cent were found to be literates. Another study by Sajane (2010), showed

beneficiaries were cent per cent literates and less than 10 per cent of non-beneficiaries were illiterates.

4.2.4 Family size

The distribution of respondents in terms of family size is presented in the Table 7. The size of family is classified into three groups as less than two members, 2-3 members and more than 4 members. The average family size of respondents was found to be 2.8. In case of both beneficiaries and non-beneficiaries 46.6 and 40 per cent of the respondents had a family size of 2-3 members. In context a study by Sajane (2010), indicated the average size of family for KCC borrowers was 5.6 and for the non-KCC borrowers was 5.15

Table 7. Family size of respondents

Sl.no.	Family size	Beneficiaries	Non-beneficiaries	Overall
1	< 2	11 (36.66)	11 (36.66)	22 (36.66)
2	2-3	14 (46.66)	12 (40)	26 (43.33)
3	> 4	5 (16.66)	7 (23.33)	12 (20)
4	Total	30 (50)	30 (50)	60 (100)
5	Average size	2.8	2.8	2.8

Note: Figures in parentheses indicate percentage to total.

4.2.5 Occupational status

It was evident from the Table 8 that, 96.66 per cent of respondents had agriculture as their main source of living. If we consider beneficiaries 93.33 per cent were depending on agriculture as their main source of living. In the case of non-beneficiaries, main source of living was found to be agricultural income for their livelihood. It was interesting to know that among respondents one student was managing his farm during holidays.

In contrary to this, a study conducted by Sangitha (2007) showed majority of card holders from commercial bank, RRB and co-operative banks had more than 90 per cent as non-farm income.

Table 8. Occupational status of the respondents

| Particulars | Agriculture as main | Agriculture as subsidiary | | Total |
		Own business	Student	
Beneficiaries	28 (93.33)	1 (3.33)	1 (3.33)	30 (100)
Non-beneficiaries	30 (100)	-	-	30 (100)
Total	58 (96.66)	1 (1.66)	1 (1.66)	60 (100)

Note: Figures in parentheses indicate percentage to total.

4.2.6 Family expenditure pattern

The expenditure pattern of respondents is presented in the Table 9. It is one of the important component to understand how the respondents distribute their income for various expenses in a year. Expenditure was calculated as annual spending of the respondents for each of the purpose. The aggregate family expenditure was found to be ₹1,13,455 year^{-1}, out of which expenditure on food was found to be more followed by education expenses. When we consider beneficiaries 70.47 per cent of the total expenditure was on food followed by 21.93 per cent on education, 3.72 and 3.89 per cent on medical and transportation expenses respectively. In case of non- beneficiaries same pattern was observed with 66.31 per cent towards food expenses followed by 24.24 per cent for education, 5.27 per cent towards medical expenses and 4.18 per cent for transportation.

Table 9. Family expenditure pattern of the respondents (₹ year^{-1})

Sl.no	Purpose	Beneficiaries	Non-beneficiaries	Aggregate
1	Food	78,100.00 (70.47)	76,400.00 (66.31)	77,250 (68.08)
2	Education	24,400.00 (21.93)	27,933.33 (24.24)	26,327.27 (23.20)
3	Medical	4,150.34 (3.72)	6,080.00 (5.27)	5,308.47 (4.7)
4	Transportation	4,320.00 (3.89)	4,820.00 (4.18)	4,570.00 (4.02)
5	Total	1,10,970.34 (100)	1,15,233.33 (100)	1,13,455.7 (100)

Note: Figures in parentheses indicate percentage to total.

4.2.7 Land holding pattern

In order to know the land holding pattern of the respondents they were classified into three groups as less than 50 cents, 50-100 cents and more than or equal to 100 cents (Table 10). The average size of the holding of the sample was found to be 61.45 cents. The holding size of beneficiaries was more than non-beneficiaries which was 67.7 cents and 55.2 cents respectively. The results showed that in case of beneficiaries 50 per cent respondents owned a land area of 50-100 cents followed by 45 per cent owned less than 50 cents and only 10 per cent had a land holding of more than 100 cents. In case of non-beneficiaries 50 per cent each of the respondents possessed holding sizes of 50-100 cents and less than 50 cents.

Table 10. Land holding pattern of the respondents

Particulars	Size of holding (cents)			Total	Average size of holding (cents)
	<50	50-100	≥ 100		
Beneficiaries	12 (40)	15 (50)	3 (10)	30 (100)	67.7
Non-beneficiaries	15 (50)	15 (50)	-	30 (100)	55.2
Total	27 (45)	30 (50)	3 (5)	60(100)	61.45

Note: Figures in parentheses indicate percentage to total.

The results are in context with the study carried by Sirisha (2014) which also highlighted that the average size of the land holding was found to be slightly more for beneficiaries when compared to non-beneficiaries.

4.2.8 Livestock details

The details on the possession of livestock by the respondents is presented in the Table 11. In the study area majority of the farmers possessed cattle and it was the major subsidiary source of income for the farmers. It is evident from the table that 59.6 and 40.4 per cent of non-beneficiaries and beneficiaries owned cattle. The average annual income was found to be more in case of non-beneficiaries compared to aggregate and beneficiaries accounting for ₹3,17,520

₹3,07,328.57 and ₹2,92,341.18 respectively. A similar trend was observed for average expenditure and net income which were ₹2,27,808 and ₹89,712 respectively in case of non-beneficiaries, for the aggregate was ₹2,18,671.43 and ₹88,657.14 and for beneficiaries was ₹2,05,235.29 and ₹87,105.88 respectively.

Table 11. Livestock details of the respondents

Sl.no	Particulars	Beneficiaries	Non-beneficiaries	Aggregate
1	Number of farmers owning cattle's	17 (40.4)	25 (59.6)	42 (100)
2	Average annual income (₹/year)	2,92,341.18	3,17,520	3,07,328.57
3	Average expenditure (₹/year)	2,05,235.29	2,27,808	2,18,671.43
4	Average net income (₹/year)	87,105.88	89,712	88,657.14

Note: Figures in parentheses indicate percentage to total.

4.2.9 Cropping pattern

In the study area majority of the farmers cultivated banana and tapioca as major crops. Apart from these crops they also cultivated vegetables like yard long bean, cucumber and amaranthus which are grouped under vegetables. For the analysis farmers were categorised into six groups as Banana + cattle, Banana + tapioca, Banana + Tapioca + Cattle, Tapioca +Cattle, Vegetable + cattle and others which include host of crops other than above mentioned crops. It is presented in Table 12.

The total net sown area under different cropping pattern was found to be 17.97 ha and the total number of cattle possessed by respondents was 76. From the table it is evident that 36.6 per cent of the farmers followed other category which may or may not include cattle along with the one crop or multiple crops. This pattern is followed by 21.6 per cent respondents practicing vegetable+cattle, followed by 13.4 per cent practicing banana+cattle, and 10 per cent each following banana+tapioca and banana+tapioca+cattle and only 8 per cent were practicing tapioca+cattle pattern. The area under different cropping pattern also

followed a similar pattern with maximum area under other category followed by vegetable+cattle, banana+tapioca+cattle, banana+tapioca, banana+cattle and tapioca+cattle (45.6, 18.9, 11.2, 10.1, 8.5 and 5.7 per cent respectively). The gross cropped area was found to be 24.77 ha and the net sown area was found to be 17.29 ha and the cropping intensity was found to be 143.26 per cent.

Table 12. Distribution of respondents according to the cropping pattern

Sl. No.	Cropping pattern	Number of farmers	Area under crop (ha)	Number of cattle
1	Tapioca + Cattle	5 (8.4)	1.03 (5.7)	9 (11.8)
2	Banana + Tapioca	6 (10)	1.83 (10.1)	-
3	Banana + Tapioca + Cattle	6 (10)	1.99 (11.2)	12 (15.7)
4	Banana + Cattle	8 (13.4)	1.52 (8.5)	12 (15.7)
5	Vegetable + Cattle	13 (21.6)	3.40 (18.9)	21 (27.9)
6	Others	22 (36.6)	8.20 (45.6)	22 (28.9)
	Total	60 (100)	17.97 (100)	76 (100)
7	Gross cropped area (ha)	24.77		
8	Net sown area (ha)	17.29		
9	Cropping intensity (%)	143.26		

Note: Figures in parentheses indicate percentage to total.

A study by Prakash (2013) found that the cropping intensity was 223.11 per cent among the beneficiaries of KCC and 206.6 per cent among the non-beneficiaries.

4.2.10 Area under different crop cultivated by respondents

The respondents in the study cultivated a variety of crops majorly constituted with vegetables. For the convenience of the analysis the only the major crops were considered and are banana, tapioca and vegetables which includes yard long bean, cucumber and amaranthus. As the farmers in the study area cultivated atleast two crops at a time on separate piece of land, in order know the area under each crop grown.

4.2.10.1 Area under banana and tapioca cultivation

For the ease of analysis the respondents were classified based on land area under banana and tapioca cultivation as <20, 20-30, 30-40, 40-50, 50-60 and >60 cents and is presented in Table 13.

The average area under banana for beneficiaries was 44.5 cents and that of non-beneficiaries was 42.94 cents. It was found that 30 per cent each of respondents had 30-40 and 20-30 cents under banana cultivation followed by 21.6 per cent respondents had 20-30 cents under cultivation, 20 per cent respondents had 40-50 cents and 10 per cent respondents had >60 cents in case of beneficiaries. In case of non-beneficiaries a similar trend was observed with 47.05 per cent of respondents had 30-40 followed by 23.53 per cent respondents had 50-60 cents, 11.77 per cent each respondents had 20-30 and 40-50 cents under banana.

Table 13. Distribution of respondents based on area under banana and tapioca cultivation

Sl. no.	Particulars	Banana		Tapioca	
		Beneficiaries	Non-beneficiaries	Beneficiaries	Non-beneficiaries
1	< 20	1 (5)	1 (5.88)	4 (25)	2 (16.67)
2	20-30	6 (30)	2 (11.77)	7 (43.75)	3 (25)
3	30-40	6 (30)	8 (47.05)	3 (18.75)	4 (33.34)
4	40-50	4 (20)	2 (11.77)	2 (12.5)	1 (8.33)
5	50-60	1 (5)	4 (23.53)	-	1 (8.33)
6	>60	2 (10)	-	-	1 (8.33)
7	Total	20 (100)	17 (100)	16 (100)	12 (100)
8	Average area	44.5	42.94	39.58	30.65

Note: Figures in parentheses indicate percentage to total.

The average area under tapioca for beneficiaries was 39.58 cents and that of non-beneficiaries was 30.65 cents. It was found that 43.75 per cent of respondents had 20-30 under tapioca cultivation followed by 25 per cent respondents had < 20 cents under cultivation, 18.75 per cent respondents had 30-

40 cents and 12.5 per cent respondents had 40-50 cents in case of beneficiaries. In case of non-beneficiaries a similar trend was observed with 33.34 per cent of respondents had 30-40 followed by 25 per cent respondents had 20-30 cents, 16.67 per cent respondents had < 20 and 40-50 cents under tapioca.

4.2.10.2 Area under vegetable cultivation

Here the respondents were categorised as having <20, 20-30 and >30 cents of land area under the crops and the results are presented in Table 14. The average area under the yard long bean for beneficiaries was 28.46 cents and that of non-beneficiaries was 26.87 cents. In case of beneficiaries 70 per cent of them had >30 cents under the crop followed by 60 per cent had 20-30 cents and 50 per cent had <20 under the crop. In case non-beneficiaries 66.7 per cent had >30 cents and 44.5 per cent had <20 cents and 40 per cent had 20-30 cents under the crop.

The average area under the cucumber for beneficiaries was 31.5 cents and that of non-beneficiaries was 25 cents. In case of beneficiaries 25 per cent each of them had <20 and >30 cents under the crop followed by 10 per cent had 20-30 cents under the crop. In case non-beneficiaries 40 per cent had 20-30 cents and 33.3 per cent each had <20 and >30 cents under the crop.

Table 14. Distribution of respondents based on area under vegetable cultivation

Particulars	Beneficiaries				Non-beneficiaries			
	< 20	20-30	>30	Average area	< 20	20-30	>30	Average area
Yard long bean	4 (50)	6 (60)	3 (75)	28.46	4 (44.5)	2 (40)	2 (66.7)	26.87
Cucumber	2 (25)	1 (10)	1 (25)	31.5	3 (33.3)	2 (40)	1 (33.3)	25
Amaranthus	2 (25)	3 (30)	-	22	2 (22.2)	1 (20)	-	20
Total	8 (100)	10 (100)	4 (100)	81.96	9 (100)	5 (100)	3 (100)	71.87

Note: Figures in parentheses indicate percentage to total.

The average area under amaranthus for beneficiaries was 22 cents and that of non-beneficiaries was 20 cents. In case of beneficiaries 30 per cent of had 20-30 cents under the crop followed by 25 per cent had <20 cents under the crop. In case non-beneficiaries 22.2 per cent had <20 cents and 20 per cent had 20-30 cents under the crop.

4.2.14 Socio-economic variables influencing the respondents in joining the KCC scheme

In order to know the variables influencing the respondents in joining the KCC scheme, binary logit analysis was carried out. The dependent variable was considered to be beneficiaries with a value of one and non-beneficiaries with a value of zero. The independent variables considered for analysis were cropping pattern (code), area under the crops grown (ha), yield obtained from crop enterprises (ha^{-1}), gross income received (₹) and expenditure incurred (₹), age of respondents (years), education (code), and number of family members of the respondents. For the variable cropping pattern the coding followed the sequence of one for tapioca+cattle, two for banana+tapioca+cattle, three for banana+tapioca, four for banana+cattle, five for vegetable+cattle and six for others. In case of the variable education the coding pattern was one for no schooling, two for upper primary, three for secondary, four for higher secondary, five for graduation and six for post graduation. Among these variables, cropping pattern and education were found to be significant at 5 per cent level of significance and positively influencing the respondents in joining the scheme. It is presented in the Table 15.

The results indicated that cropping pattern and education are significantly affecting adoption of KCC. A study by Barik (2011) and Kumar *et al* (2011) reported a positive relationship with KCC and land holding of the respondents.

Table 15. Binary logit regression model

Sl.no.	Variable	Coefficient	Standard error	P-value
1	Intercept	-1.97	2.99	0.51
2	Cropping pattern	0.26*	0.20	0.01
3	Area (ha)	-1.14	1.87	0.54
4	Yield (per ha)	0.003	0.0016	0.74
5	Income (₹)	0.70	0.33	0.83
6	Expenditure (₹)	0.54	0.46	0.24
7	Age (years)	0.004	0.35	0.91
8	Education	0.48*	0.26	0.04
9	No. of family members	-0.84	0.59	0.15

*Significant at 5 per cent level of significance

4.3 ECONOMICS OF THE CROPS GROWN BY THE RESPONDENTS

4.3.1 Economics of Banana cultivation

4.3.1.1 Cost of cultivation of banana

The cost of cultivation of banana was computed for the beneficiaries and non-beneficiaries of KCC and presented in Table 16 and fig 10. From the data analysed it was found that, the total cost of cultivation for the beneficiaries was ₹2,78,787 ha^{-1} at Cost C. Among the different costs, Cost A$_1$ accounted for ₹1,22,442 ha^{-1}, Cost A$_2$ (₹1,58,142 ha^{-1}) and Cost B (₹2,69,925 ha^{-1}). Out of total Cost A$_1$ incurred to beneficiaries 50.47 per cent was accounted by hired labour followed by manures and soil ameliorants (23.43 per cent), fertilizers constituted 7.45 per cent and seeds (suckers) constituted 6.22 per cent.

In the case of non-beneficiaries the total cost of cultivation was found to be ₹2,64,384 ha^{-1}, Cost A$_1$ was found to be ₹1,15,715 ha^{-1}, Cost A$_2$

Table 16. Cost of cultivation of banana

Sl. No.	Particulars	Beneficiaries		Non-beneficiaries		Aggregate	
		Cost (₹/ha)	Percent to cost A_1	Cost (₹/ha)	Percent to cost A_1	Cost (₹/ha)	Percent to cost A_1
1	Hired labour	61800	50.47	61382.35	53.04	61608.11	51.61
2	Seed	7620	6.22	7165.29	6.19	7411.08	6.21
3	Fertilizer	9125	7.45	7781.17	6.72	8507.56	7.12
4	Manures and soil ameliorants	28700	23.43	24935.29	21.54	26970.27	22.59
5	Plant protection chemicals	2764.15	2.25	2340.95	2.02	2569.71	2.15
6	Land revenue	41.83	0.034	40.36	0.03	41.15	0.034
7	Depreciation	175.58	0.143	141.37	0.12	159.86	0.13
8	Interest on working capital	7715.85	6.30	7252.35	6.26	7502.89	6.28
9	Miscellaneous	4500	3.67	4676.47	4.04	4581.08	3.83
	Cost A_1	122442.42	100	115715.63	100	119351.7	100
10	Rental value of leased in land	35700		45294.11		40108.11	
	Cost A_2	158142.42		161009.75		159459.8	
11	Rental value of owned land	103000		86352.94		95351.35	
12	Interest on owned fixed capital excluding land	8783.46		9492.05		9109.03	
	Cost B	269925.88		256854.74		263920.2	
13	Family labour	8862		7529.41		8249.73	
	Cost C	278787.88		264384.16		272170	
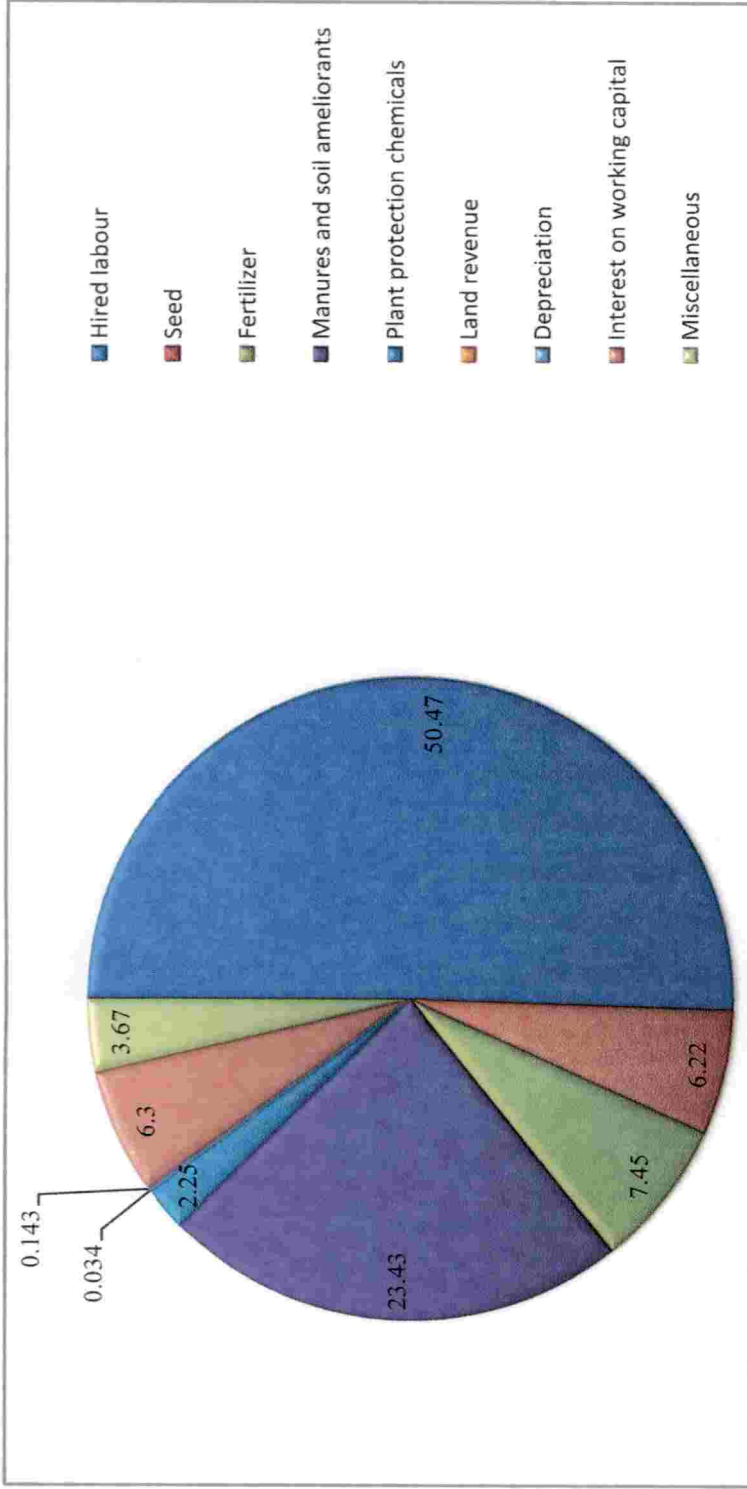
Figure 10. Cost A_1 of banana cultivation for beneficiaries
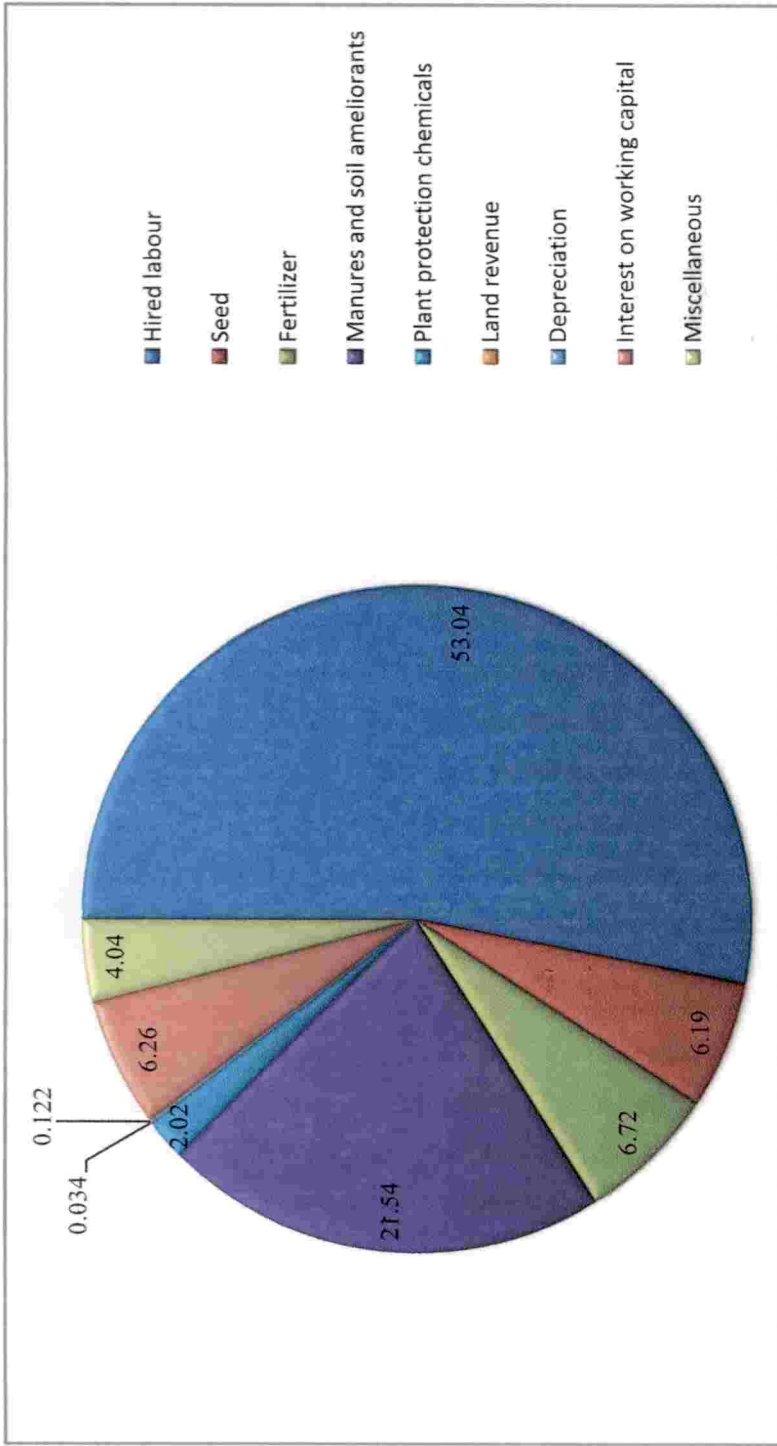
Figure 11. Cost A$_1$ of banana cultivation for non-beneficiaries

($1,61,009 ha^{-1}) and Cost B ($2,56,854 ha^{-1}). Out of the total Cost A$_1$, 53.04 per cent was accounted by hired labour, followed by manures and soil ameliorants (21.54 per cent), fertilizers (6.72 per cent) and seeds ie., suckers used for planting (6.19 per cent). It is presented in fig 11.

The aggregate cost of cultivation was found to be $2,72,170 ha^{-1}, Cost A$_1$ was found to be $1,19,351 ha^{-1}, Cost A$_2$ was $1,59,459 ha^{-1} and Cost B was $2,63,920 ha^{-1}. When we consider Cost A$_1$ about 51.61 per cent of which is accounted by hired labour, followed by manures and soli ameliorants (22.59 per cent), fertilizers (7.12 per cent).

4.3.1.2 Returns from banana and B:C ratio

The yield obtained by the beneficiaries was 4909 kg ha^{-1} and a gross returns of $3,19,125 ha^{-1}. The net returns at Cost A$_1$, Cost A$_2$, Cost B and Cost C were $1,96,682 ha^{-1}, $1,60,982 ha^{-1}, $49,199 ha^{-1} and $40,337 ha^{-1} respectively. The profitability was found using the B:C ratio is presented in Table 17. For the beneficiaries it was found to be as 2.6, 2.01, 1.18 and 1.14 respectively at Cost A$_1$, Cost A$_2$, Cost B and Cost C.

For non-beneficiaries the yield was found to be 4264 kg ha^{-1}. The gross returns was found to $2,77,176 ha^{-1} and the net returns at Cost A$_1$, Cost A$_2$, Cost B and Cost C were $1,61,460 ha^{-1}, $1,16,166 ha^{-1}, $20,321 ha^{-1} and $12,792 ha^{-1} respectively. The B:C ratio at Cost A$_1$, Cost A$_2$, Cost B and Cost C were 2.39, 1.72, 1.07 and 1.04 respectively.

The aggregate yield was found to be 4613.09 kg ha^{-1} with a gross income of $2,99,851 ha^{-1}. The net returns at Cost A$_1$, Cost A$_2$, Cost B and Cost C were $1,80,499 ha^{-1}, $1,40391 ha^{-1}, $35,931 ha^{-1} and $27,681 ha^{-1} respectively. The B:C ratio at these costs were found to be 2.51, 1.88, 1.14 and 1.10 respectively.

Table 17. Returns and B:C ratio of banana

Sl. No.	Particulars	Aggregate		
		Beneficiaries	Non-beneficiaries	Aggregate
1	Yield (kg/ha)	4909.62	4264.25	4613.09
2	Price (₹/kg)	65	65	65
3	Gross returns (₹/ha)	319125	277176.47	299851.4
4	Net returns at Cost A_1 (₹/ha)	196682.58	161460.84	180499.7
5	Net returns at Cost A_2 (₹/ha)	160982.58	116166.72	140391.6
6	Net returns at Cost B (₹/ha)	49199.12	20321.73	35931.2
7	Net returns at Cost C (₹/ha)	40337.12	12792.31	27681.4
	B:C ratio			
8	Cost A_1	2.60	2.39	2.51
9	Cost A_2	2.01	1.72	1.88
10	Cost B	1.18	1.07	1.14
11	Cost C	1.14	1.04	1.10

4.3.1.3 Resource use efficiency

Cobb-Douglas production function was fitted separately for all the crops at aggregate level.

The specification of the fitted production was

$$Y = aX_1^{b_1} X_2^{b_2} X_3^{b_3} X_4^{b_4} \ e^n$$

Where,

Y= Yield (kg ha^{-1}).

X_1 = Quantity of hired labour (ha^{-1}).

X_2 = Quantity of family labour (ha^{-1}).

X_3 = Quantity of fertilizers and manures (ha^{-1}).

X_4 = Quantity of plant protection chemicals (ha^{-1}).

a = Intercept

$b_1 \ldots b_4$ = Regression coefficients of explanatory variables.

e^n = Stochastic error term

The co-efficient of determination (R^2) is used to explain the variation in the dependent variable caused by the independent variables included in the production function. The elasticity of production is given by the estimated regression coefficients (b_i) of respective inputs (X_i). The regression coefficient b_i indicates the percentage change in the gross income (Y) if the input expenditure (X_i) changes by one unit while all other factors remain constant at their geometric mean levels.

4.3.1.3.1 Resource use efficiency of banana cultivation

The resource use efficiency of worked out is presented in Table 18. The R^2 value of 0.77 explains that 77 per cent of the variation in the yield is due to the independent variables included in the model. Among the different variables under study manures and fertilizers was found to be significant at five per cent level of significance and positively influencing the yield. The other variables considered in the study were also positive, but not significantly influencing the yield. A one per cent increase in the use of hired labour, family labour, manures and fertilizers and plant protection chemicals is found to increase yield by 0.32, 0.21, 0.65 and 0.15 per cent. The Σb_i value was found to be 1.36, means a simultaneous increase in all the independent variables by one per cent will increase the yield by 1.36 per cent which in turn is showing increasing returns to scale. The VIF was found be less hence the there was no problem of multicollinearity.

4.3.1.4 Allocative efficiency in banana

Marginal value productivity analysis was carried out and allocative efficiency was worked out in order to know the efficiency in the utilization of the resources and the results are presented in Table 19.

The allocative efficiency was found to be greater than one for all the resources indicating under utilization of the resources. This is an indication that

the respondents can make the better utilization of the resources which would lead to increase the yield of the crop thereby the income of the respondents.

Table 18. Estimated production function for aggregate under banana cultivation

Sl. No.	Particulars	Aggregate			
		Coefficients	Standard error	P value	VIF
1	Intercept	2.961	0.782	0.0006	-
2	Quantity of Hired labour	0.329	0.153	0.168	1.19
3	Quantity of Family labour	0.219	0.156	0.105	1.00
4	Quantity of Manures and fertilizers	0.656*	0.125	0.039	1.10
5	Quantity of Plant protection chemicals	0.157	0.141	0.274	1.11
6	R^2	0.77			
7	$\overline{R^2}$	0.71			
8	Calculated F	11.78			
9	$\Sigma\, b_i$	1.36			
10	Number of observations	37			

*Significant at 5 per cent level

Note: The coefficients were obtained with log value

Table 19. MVP and MFC of different inputs used in banana production

Sl. No.	Particulars	Aggregate			
		Geometric mean	MVP	MFC	k = MVP/MFC
1	Yield	3287.82	-	-	-
2	Hired labour	11.11	4228.75	220.87	19.14
3	Family labour	12.06	5669.60	206.77	27.41
4	Fertilizers and manures	213.63	650.21	251	2.59
5	Plant protection chemicals	3.49	9162.77	587.5	15.59

4.3.2 Economics of Tapioca

4.3.2.1 Cost of cultivation of tapioca

From the data analysed it was found that, the total cost of cultivation for the beneficiaries was ₹1,80,205 ha^{-1} and is presented in Table 20 and fig 12. Among the different costs, Cost A$_1$ accounted for ₹75,611 ha^{-1} out of which hired labour accounted for 63.31 per cent, followed by manures and soil ameliorants

(14.52 per cent), fertilizers (12.57 per cent). Cost A_2 was found to be ₹1,00,017 ha^{-1} and Cost B (₹1,74,580.20 ha^{-1}).

In case of non-beneficiaries the total cost of cultivation was found to be ₹1,82,665 ha^{-1}, Cost A_1 was found to be ₹73,231 ha^{-1}, Cost A_2 (₹1,04,481 ha^{-1}) and Cost B (₹1,75,332 ha^{-1}). Out of the total Cost A_1, 69.98 per cent was accounted by hired labour, followed by manures and soil ameliorants (16.59 per cent). It is presented in fig 13.

The aggregate cost of cultivation was found to be ₹1,81,259 ha^{-1}, Cost A_1 was found to be ₹74,591 ha^{-1}, Cost A_2 was ₹1,01,930 ha^{-1} and Cost B was ₹1,74,902 ha^{-1}. When we consider Cost A_1 about 62.12 per cent of which is accounted by hired labour, followed by manures and soli ameliorants (15.39 per cent), fertilizers (9.14 per cent).

4.3.2.2 Returns from tapioca and B:C ratio

The beneficiaries obtained an yield of 7583 kg ha^{-1} with a gross returns of ₹1,89,593 ha^{-1}. The net returns at Cost A_1 was ₹1,13,982 ha^{-1} with a B:C ratio of 2.43, the returns at Cost A_2 was found to be ₹89,576 ha^{-1} and the B:C ratio was found to be 1.85, at Cost B the returns was ₹15,013 ha^{-1} with B:C ratio of 1.07 and returns at Cost C was ₹9,388 ha^{-1} and the profitability was 1.04. It is presented in Table 21.

For non-beneficiaries the yield was found to be 7370 kg ha^{-1}. The gross returns was found to ₹1,84,250 ha^{-1} and the net returns at Cost A_1, Cost A_2, Cost B and Cost C were ₹1,11,081.9 ha^{-1}, ₹79,768.9 ha^{-1}, ₹8,917.9 ha^{-1} and ₹1,584.6 ha^{-1} respectively. The B:C ratio at Cost A_1, Cost A_2, Cost B and Cost C were 2.40, 1.71, 1.03 and 1.01 respectively.

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Table 20. Cost of cultivation of tapioca

Sl. No.	Particulars	Beneficiaries		Non-beneficiaries		Aggregate	
		Cost (₹/ha)	Percent to cost A_1	Cost (₹/ha)	Percent to cost A_1	Cost (₹/ha)	Percent to cost A_1
1	Hired labour	47875	63.31	51250	69.98	49321.43	66.12
2	Seed	1353.75	1.79	1112.50	1.52	1250.35	1.67
3	Fertilizer	9506.25	12.57	3245.83	4.43	6823.21	9.14
4	Manures and soil ameliorants	10983.75	14.52	12153.33	16.59	11485	15.39
5	Plant protection chemicals	500	0.66	262.50	0.35	398.21	0.53
6	Land revenue	28.78	0.03	37.21	0.05	32.39	0.04
7	Depreciation	176.12	0.23	139.72	0.19	160.52	0.22
8	Interest on working capital	4915.31	6.50	4761.69	6.50	4849.47	6.50
9	Miscellaneous	272.50	0.36	268.33	0.36	270.74	0.36
	Cost A_1	75611.48	100	73231.12	100	74591.32	100
10	Rental value of leased in land	24406.25		31250		27339.28	
	Cost A_2	100017.7		104481.10		101930.60	
11	Rental value of owned land	65812.50		61000		63750	
12	Interest on owned fixed capital excluding land	8749.99		9850.95		9221.83	
	Cost B	174580.20		175332.10		174902.40	
13	Family labour	5625		7333.33		6357.14	
	Cost C	180205.20		182665.40		181259.60	

Legend:
- Hired labour
- Seed
- Fertilizer
- Manures and soil ameliorants
- Plant protection chemicals
- Land revenue
- Depreciation
- Interest on working capital
- Miscellaneous

Pie values: 63.31, 0.36, 6.5, 0.23, 0.03, 0.66, 14.52, 12.57, 1.79
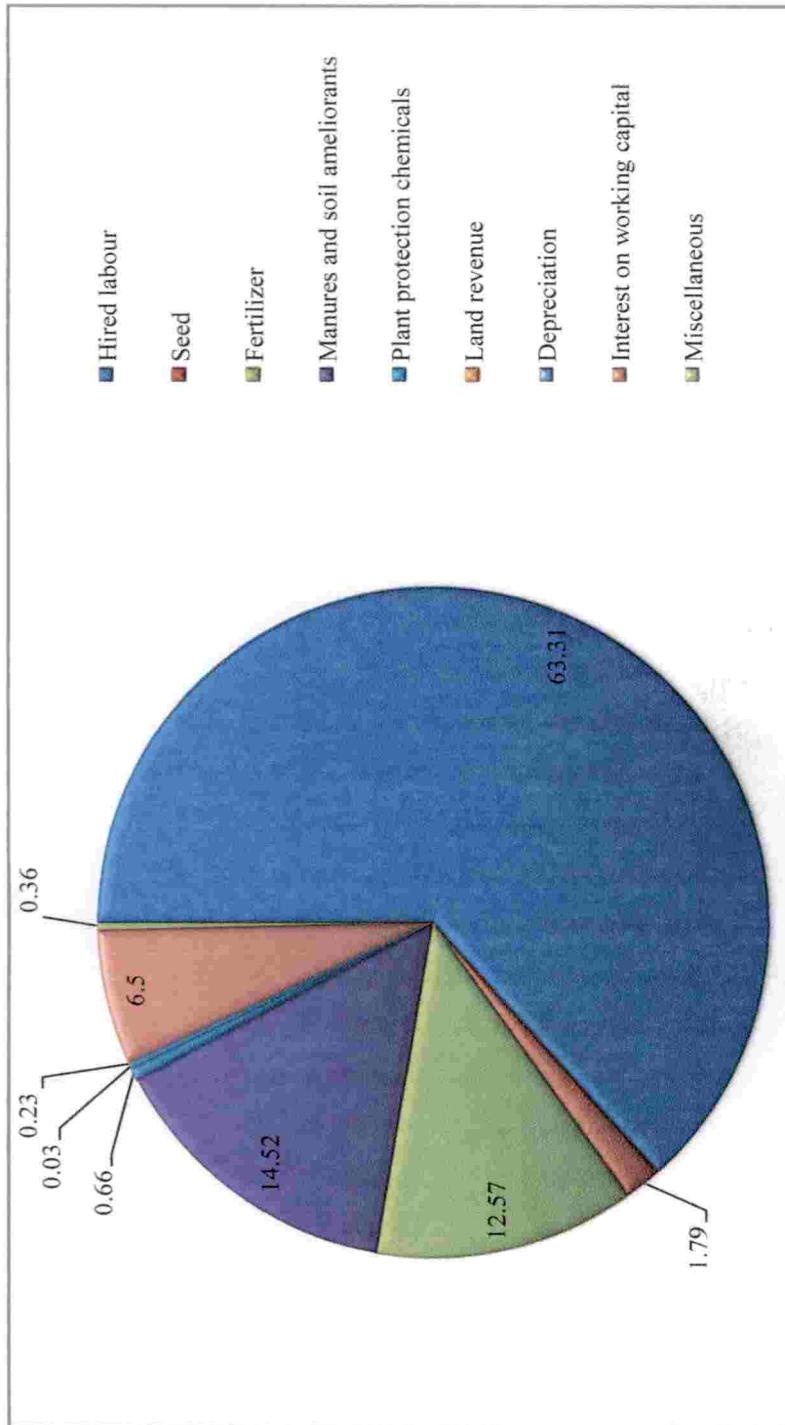
Figure 12. Cost A_1 of tapioca cultivation for beneficiaries
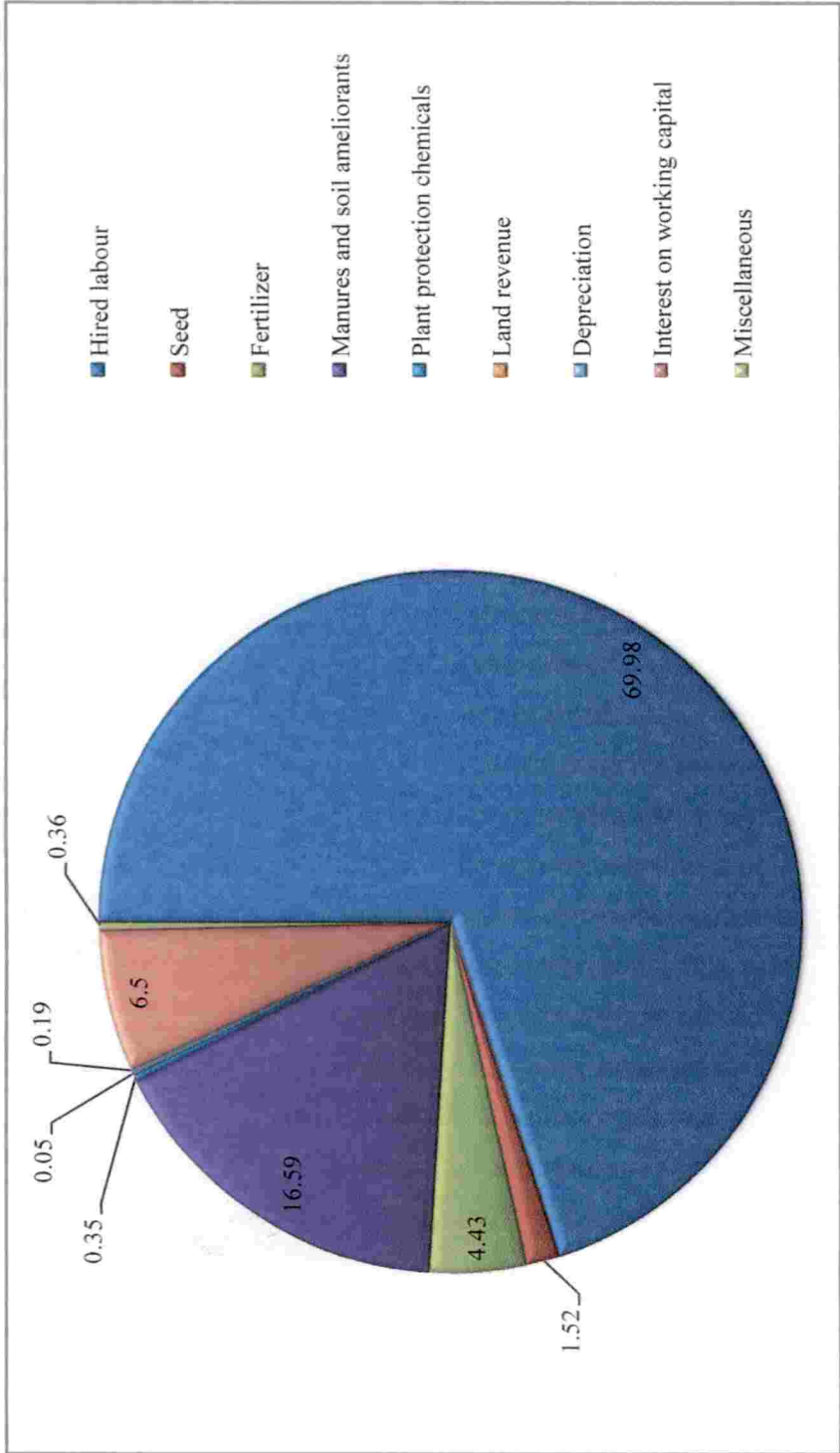
Figure 13. Cost A$_1$ of tapioca cultivation for non-beneficiaries

Legend:
- Hired labour
- Seed
- Fertilizer
- Manures and soil ameliorants
- Plant protection chemicals
- Land revenue
- Depreciation
- Interest on working capital
- Miscellaneous

Pie chart values: 69.98, 0.36, 6.5, 0.19, 0.05, 0.35, 16.59, 4.43, 1.52

The aggregate yield was found to be 7492 kg ha^{-1} with a gross income of ₹1,87,303 ha^{-1}. The net returns at Cost A$_1$, Cost A$_2$, Cost B and Cost C were ₹1,12,712 ha^{-1}, ₹85,373 ha^{-1}, ₹12,401 ha^{-1} and ₹6,044 ha^{-1} respectively. The B:C ratio at these costs were found to be 2.51, 1.83,1.07 and 1.03 respectively.

Table 21. Returns and B:C ratio of tapioca

Sl. No.	Particulars	Aggregate		
		Beneficiaries	Non-beneficiaries	Aggregate
1	Yield (kg/ha)	7583.7	7370	7492.1
2	Price (₹/kg)	25	25	25
3	Gross returns (₹/ha)	189593.8	184250	187303.6
4	Net returns at Cost A$_1$ (₹/ha)	113982.3	111018.9	112784.2
5	Net returns at Cost A$_2$ (₹/ha)	89576.1	79768.9	85373.0
6	Net returns at Cost B (₹/ha)	15013.6	8917.9	12401.0
7	Net returns at Cost C (₹/ha)	9388.6	1584.6	6044.0
	B:C ratio			
8	Cost A$_1$	2.43	2.40	2.51
9	Cost A$_2$	1.85	1.71	1.83
10	Cost B	1.07	1.03	1.07
11	Cost C	1.04	1.01	1.03

4.3.2.3. Resource use efficiency of tapioca cultivation

The resource use efficiency was worked out for tapioca is presented in Table 22. Among the different variables manures and fertilizers was found to have positive and significant influence on yield at one per cent level of significance. A one per cent increase in the use of manures and fertilizers is found to increase the yield by 0.12 per cent. The variables hired labour and plant protection chemicals were positive and found to be significant at five per cent level of significance. A one per cent increase in the use of hired labour and plant protection chemicals was found to increase the yield by 0.28 and 0.33 per cent respectively. The R^2 value of 0.68 explains that 68 per cent of the variation in the yield is due to the independent variables included in the model. The Σb_i value was found to be 1.06, means a simultaneous increase in all the independent variables by one per cent

will increase the yield by 1.06 per cent which in turn is showing constant returns to scale. The VIF was found be less hence the there was no problem of multicollinearity.

Table 22. Estimated production function for aggregate under tapioca cultivation

Sl. No	Particulars	Aggregate			
		Coefficients	Standard error	P value	VIF
1	Intercept	5.271	0.351	2.281	-
2	Quantity of hired labour	0.281*	0.161	0.016	1.72
3	Quantity of family labour	0.327	0.127	0.094	1.71
4	Quantity of manures and fertilizers	0.118**	0.042	0.009	1.39
5	Quantity of plant protection chemicals	0.339*	0.134	0.018	1.27
6	R^2	0.68			
7	$\overline{R^2}$	0.63			
8	Calculated F	12.65			
9	Σb_i	1.06			
10	Number of observations	28			

* Significant at 5 per cent level
**Significant at 1 per cent level
Note: The coefficients were obtained with log value

4.3.2.4 Marginal Value Productivity Analysis of tapioca

The marginal productivity analysis of tapioca showed (Table 23) that the values of the allocative efficiency was found to be less than one for manures and fertilizers and plant protection chemicals indicating the over utilization of resources. Hence suitable measures should be taken to reduce the excess use of resources. In case of hired labour and family labour allocative efficiency was found to be greater than one indicating sub optimal utilization of resources.

Table 23. MVP and MFC of different inputs used in tapioca production

Sl. No.	Particulars	Aggregate			
		Geometric mean	MVP	MFC	k = MVP/MFC
1	Yield	1263.97	-	-	-
2	Hired labour	6.00	1684.14	162.50	10.36
3	Family labour	8.75	1010.68	211.57	4.77
4	Fertilizers and manures	28.06	123.84	401.15	0.31
5	Plant protection chemicals	2.27	1.27	49.39	0.64

4.3.3 Economics of yard long bean

4.3.3.1 Cost of cultivation of yard long bean

From the data analysed it was found that, the total cost of cultivation for the beneficiaries was found to be ₹2,24,430 ha^{-1} and is presented in Table 24 and fig 14. Among the different costs, Cost A$_1$ accounted for ₹1,05,570 ha^{-1}, Cost A$_2$ (₹1,23,647 ha^{-1}) and Cost B (₹2,17,330 ha^{-1}). Out of total Cost A$_1$ incurred to beneficiaries 55.30 per cent was accounted by hired labour followed by pandal material (27.44 per cent), manures and soil ameliorants (5.97 per cent).

In case of non-beneficiaries the total cost of cultivation was found to be ₹2,29,291 ha^{-1}, Cost A$_1$ was found to be ₹1,04,187 ha^{-1} out of which hired labour accounted for 52.91 per cent followed by pandal material (18.58 per cent), manures and soil ameliorants (11.95 per cent) and fertilizers (8.19 per cent). The Cost A$_2$ was found to be ₹1,51,062 ha^{-1} and Cost B was ₹2,21,366 ha^{-1}. It is presented in fig 15.

The aggregate cost of cultivation was found to be ₹2,26,282 ha^{-1}, Cost A$_1$ was found to be ₹1,05,043 ha^{-1}, Cost A$_2$ was ₹1,34,090 ha^{-1} and Cost B was ₹2,18,867 ha^{-1}. When we consider Cost A$_1$ about 54.39 per cent of which was accounted by hired labour, followed by pandal material (24.09 per cent) manures and soli ameliorants (8.23 per cent).

Table 24. Cost of cultivation of yard long bean

Sl. No.	Particulars	Beneficiaries		Non-beneficiaries		Aggregate	
		Cost ₹/ha	Percent to cost A_1	Cost ₹/ha	Percent to cost A_1	Cost ₹/ha	Percent to cost A_1
1	Hired labour	58384.62	55.30	55125	52.91	57142.86	54.39
2	Seed	305.42	0.28	492.32	0.47	376.62	0.35
3	Fertilizer	3092.31	2.92	8537.5	8.19	5166.67	4.91
4	Manures and soil ameliorants	6307.69	5.97	12457.5	11.95	8650.47	8.23
5	Plant protection chemicals	610	0.57	806.25	0.77	684.76	0.65
6	Pandal material	28972.69	27.44	19362.5	18.58	25311.66	24.09
7	Land revenue	26.75	0.025	25.26	0.024	26.18	0.024
8	Depreciation	201.29	0.19	199.87	0.191	200.75	0.19
9	Interest on working capital	6837.09	6.47	6774.67	6.50	6813.34	6.48
10	Miscellaneous	832.30	0.78	406.25	0.38	670.00	0.63
11	Cost A_1	105570.17	100	104187.14	100	105043.30	100
	Rental value of leased in land	18076.92		46875		29047.61	
	Cost A_2	123647.10		151062.10		134090.90	
12	Rental value of owned land	89230.77		66825		80695.23	
13	Interest on owned fixed capital excluding land	4452.31		3479.58		4081.75	
	Cost B	217330.20		221366.70		218867.90	
14	Family labour	7100		7925		7414.28	
	Cost C	224430.20		229291.70		226282.20	
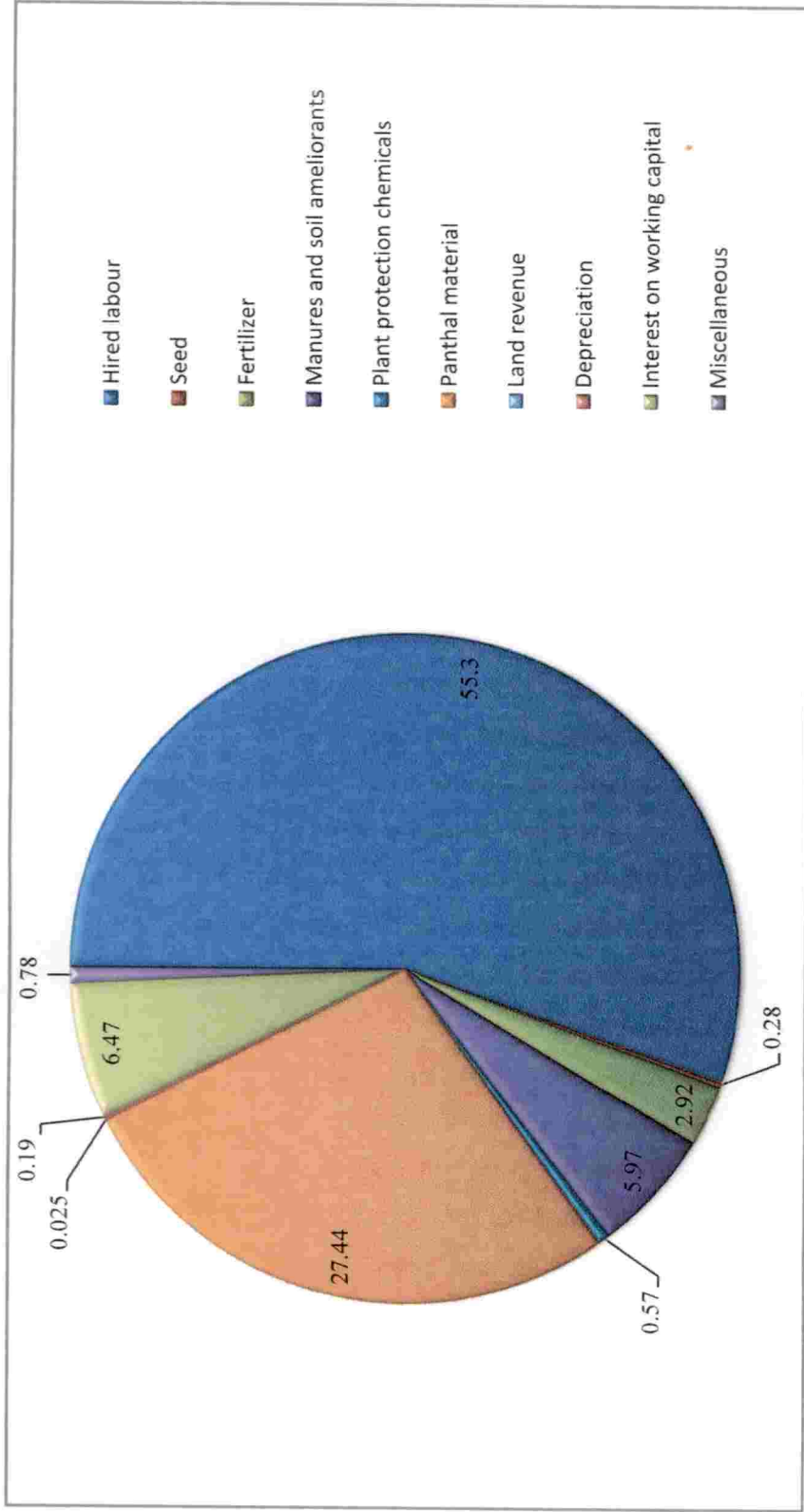
Figure 14. Cost A₁ of yard long bean cultivation for beneficiaries
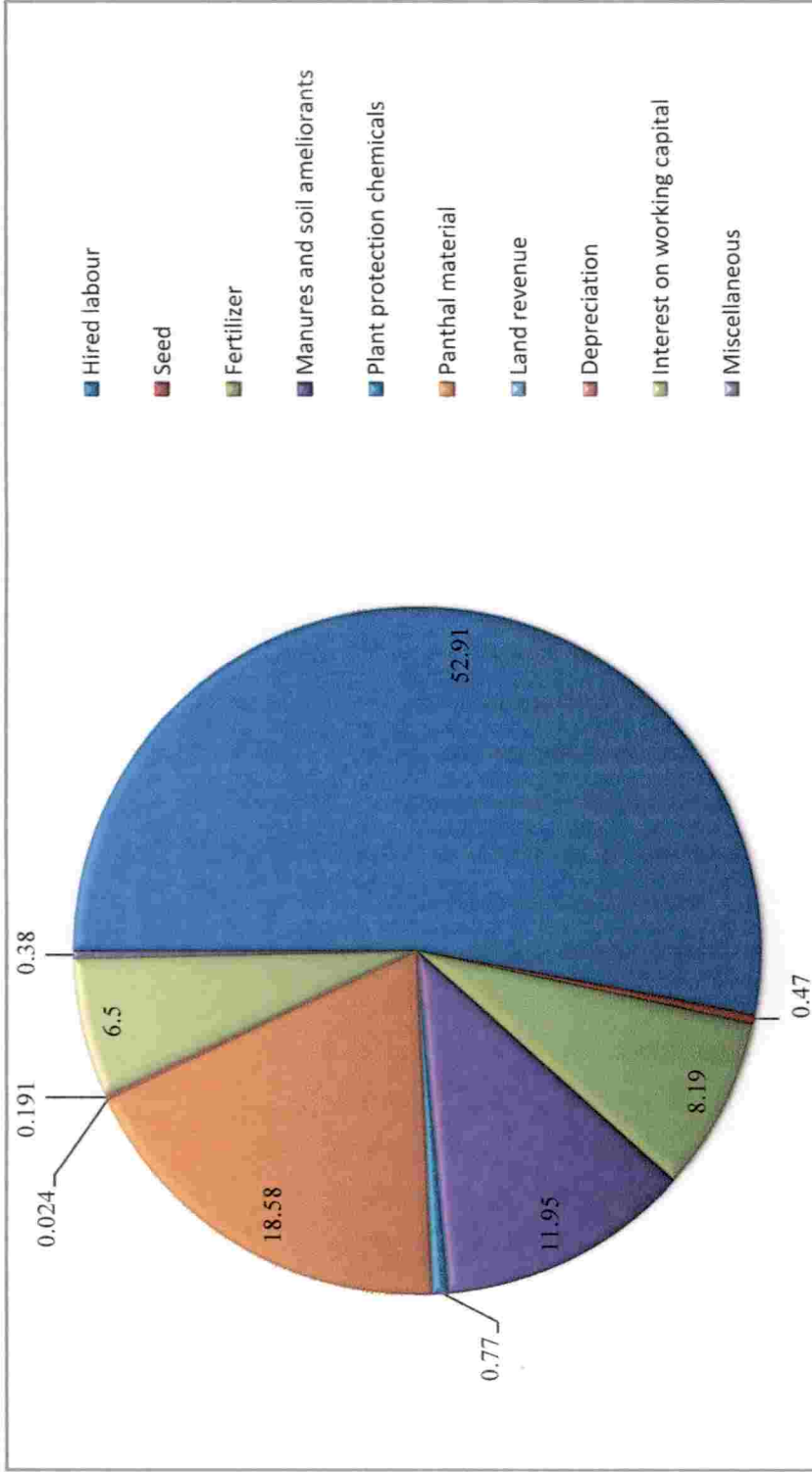
Figure 15. Cost A$_1$ of yard long bean cultivation for non-beneficiaries

4.3.3.2 Returns from yard long bean and B:C ratio

The yield obtained by the beneficiaries was 4491 kg ha^{-1} with a gross returns of ₹2,47,038 ha^{-1}. The net returns at Cost A$_1$, Cost A$_2$, Cost B and Cost C were ₹1,41,468 ha^{-1}, ₹1,23,391 ha^{-1}, ₹29,708 ha^{-1} and ₹22,608 ha^{-1} respectively. The profitability was found using the B:C ratio. For the beneficiaries it was found to be as 2.34, 1.99, 1.13 and 1.10 respectively at Cost A$_1$, Cost A$_2$, Cost B and Cost C. It is presented in Table 25.

The non-beneficiaries obtained an yield of 4211 kg ha^{-1} with a gross returns of ₹2,31,625 ha^{-1}. The net returns at Cost A$_1$ was found to be ₹1,24,737 ha^{-1} with a profitability ratio of 2.22, returns at Cost A$_2$ was ₹80,562 ha^{-1} the profitability ratio was found to be 1.53, the returns at Cost B was ₹10,258 ha^{-1} showing a profitability of 1.04 and returns at Cost C was ₹2,333 ha^{-1} with profitability of 1.01.

Table 25. Returns and B:C ratio of yard long bean

Sl. No.	Particulars	Aggregate		
		Beneficiaries	Non-beneficiaries	Aggregate
1	Yield (kg/ha)	4491.61	4211.36	4384.84
2	Price (₹/kg)	55	55	55
3	Gross returns (₹/ha)	247038.50	231625	241166.70
4	Net returns at Cost A$_1$ (₹/ha)	141468.33	124737.87	136123.40
5	Net returns at Cost A$_2$ (₹/ha)	123391.40	80562.90	107075.80
6	Net returns at Cost B (₹/ha)	29708.30	10258.30	22298.80
7	Net returns at Cost C (₹/ha)	22608.30	2333.30	14884.50
	B:C ratio			
8	Cost A$_1$	2.34	2.22	2.29
9	Cost A$_2$	1.99	1.53	1.79
10	Cost B	1.13	1.04	1.10
11	Cost C	1.10	1.01	1.06

The aggregate yield was found to be 4384 kg ha^{-1} with a gross income of ₹2,41,166 ha^{-1}. The net returns at Cost A$_1$, Cost A$_2$, Cost B and Cost C were ₹1,36,123 ha^{-1}, ₹1,07,075 ha^{-1}, ₹22,298 ha^{-1} and ₹14,884 ha^{-1} respectively. The B:C ratio at these costs were found to be 2.29, 1.79, 1.10 and 1.06 respectively.

4.3.3.3. Resource use efficiency of yard long bean cultivation

The resource use efficiency of worked out for yard long bean and is presented in Table 26. The R^2 value of 0.80 explains that 80 per cent of the variation in the yield is due to the independent variables included in the model. All the variables under study were found to be positive, only hired labour was found to be significant at five per cent level of significance. A one per cent increase in the use of hired labour is found to increase yield by 0.50 per cent. The Σb_i value was found to be 1.36, means a simultaneous increase in all the independent variables by one per cent will increase the yield will by 1.36 per cent which in turn is showing increasing returns to scale. The VIF was found be less hence the there was no problem of multicollinearity.

Table 26. Estimated production function for yard long bean cultivation

Sl. No.	Particulars	Aggregate			
		Coefficients	Standard error	P value	VIF
1	Intercept	3.331	0.721	0.0002	-
2	Quantity of hired labour	0.503*	0.210	0.029	1.09
3	Quantity of family labour	0.024	0.117	0.836	1.79
4	Quantity of manures and fertilizers	0.728	0.095	0.986	3.42
5	Quantity of plant protection chemicals	0.107	0.157	0.504	4.21
6	R^2	0.80			
7	$\overline{R^2}$	0.75			
8	Calculated F	16.66			
9	Σb_i	1.36			
10	Number of observations	21			

* Significant at 5 per cent level
Note: The coefficents were obtained with log value

4.3.3.4 Marginal Value Productivity Analysis of yard long bean

The allocative efficiency of the resources was worked out (Table 27) and found to be less than one for hired labour indicating over utilizations of resource. The other variables such as family labour, manures and fertilizers and plant protection chemicals were found to be greater than one indicting under utilization of resources. Hence the farmers have a greater scope for the better utilization of these resources in order to improve the yield of the crop.

Table 27. MVP and MFC of different inputs used in yard long bean production

Sl. No.	Particulars	Aggregate			
		Geometric mean	MVP	MFC	k = MVP/MFC
1	Yield	1504.24	-	-	-
2	Hired labour	10.13	195.86	375.97	0.52
3	Family labour	12.73	3248.16	412.18	7.88
4	Fertilizers and manures	50.47	1180.05	595.54	1.98
5	Plant protection chemicals	1.88	4822.23	438.52	10.99

4.3.4 Economics of Cucumber

4.3.4.1 Cost of cultivation of cucumber

From the data analysed it was found that, the total cost of cultivation for the beneficiaries was ₹2,35,311 ha^{-1} and is presented in Table 28 and in fig 16. Among the different costs, Cost A$_1$ accounted for ₹1,05,220 ha^{-1}, Cost A$_2$ (₹1,39,520 ha^{-1}) and Cost B (₹2,27,311 ha^{-1}). Out of total Cost A$_1$ incurred to beneficiaries 55.95 per cent was accounted by hired labour followed by pandal materials (17.57 per cent), manures and soil ameliorants (9.62 per cent), fertilizers constituted 8.67 per cent.

In case of non-beneficiaries the total cost of cultivation was found to be ₹2,32,675 ha^{-1}, Cost A$_1$ was found to be ₹95,085 ha^{-1} out of which hired labour accounted for 51.18 per cent followed by pandal material (16.48 per cent), manures and soil ameliorants (14.15 per cent) and fertilizers (8.85 per cent). The

Table 28. Cost of cultivation of cucumber

Sl. No.	Particulars	Beneficiaries		Non-beneficiaries		Aggregate	
		Cost ₹/ha	Percent to cost A_1	Cost ₹/ha	Percent to cost A_1	Cost ₹/ha	Percent to cost A_1
1	Hired labour	58875	55.95	48666.67	51.18	52750	53.21
2	Seed	246.67	0.23	203.67	0.214	220.87	0.22
3	Fertilizer	9125	8.67	8416.66	8.85	8700	8.77
4	Manures and soil ameliorants	10125	9.62	13458.33	14.15	12125	12.23
5	Plant protection chemicals	543.75	0.51	669	0.704	618.90	0.62
6	Pandal material	18488.80	17.57	15669.20	16.48	16797	16.94
7	Land revenue	29.61	0.028	60.16	0.063	47.94	0.048
8	Depreciation	169.37	0.160	117.54	0.124	138.27	0.13
9	Interest on working capital	5524.08	5.25	4999	5.26	5209.03	5.25
10	Miscellaneous	2093	1.98	2825	2.97	2532.20	2.55
	Cost A_1	105220.20	100	95085.21	100	99139.22	100
11	Rental value of leased in land	34300		54000		46120	
	Cost A_2	139520.20		149085.20		145259.20	
12	Rental value of owned land	82500		72000		76200	
13	Interest on owned fixed capital excluding land	5291.23		3090.13		3970.57	
	Cost B	227311.50		224175.30		225429.80	
14	Family labour	8000		8500		8300	
	Cost C	235311.50		232675.30		233729.80	
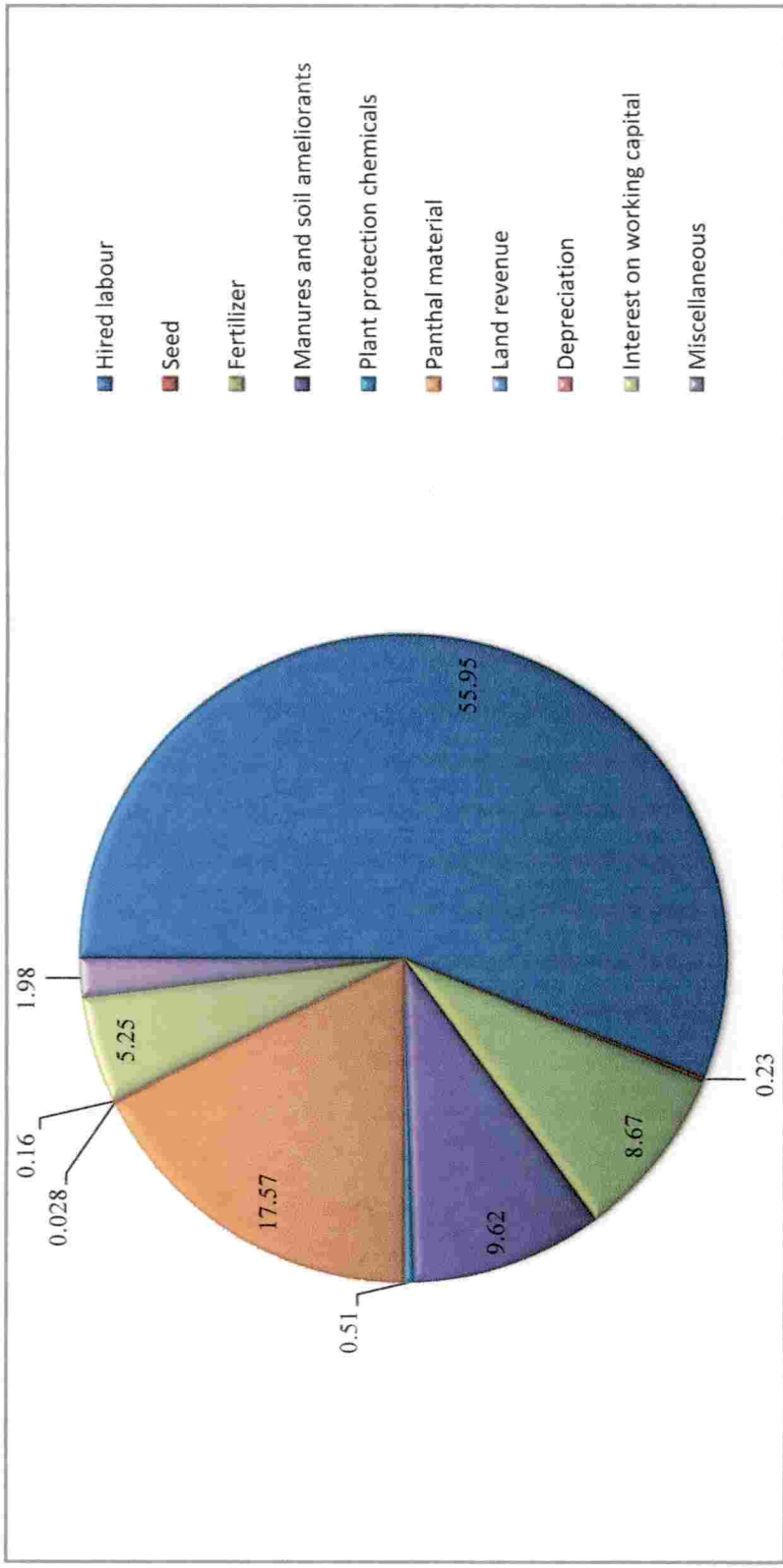
Figure 16. Cost A₁ of cucumber cultivation for beneficiaries
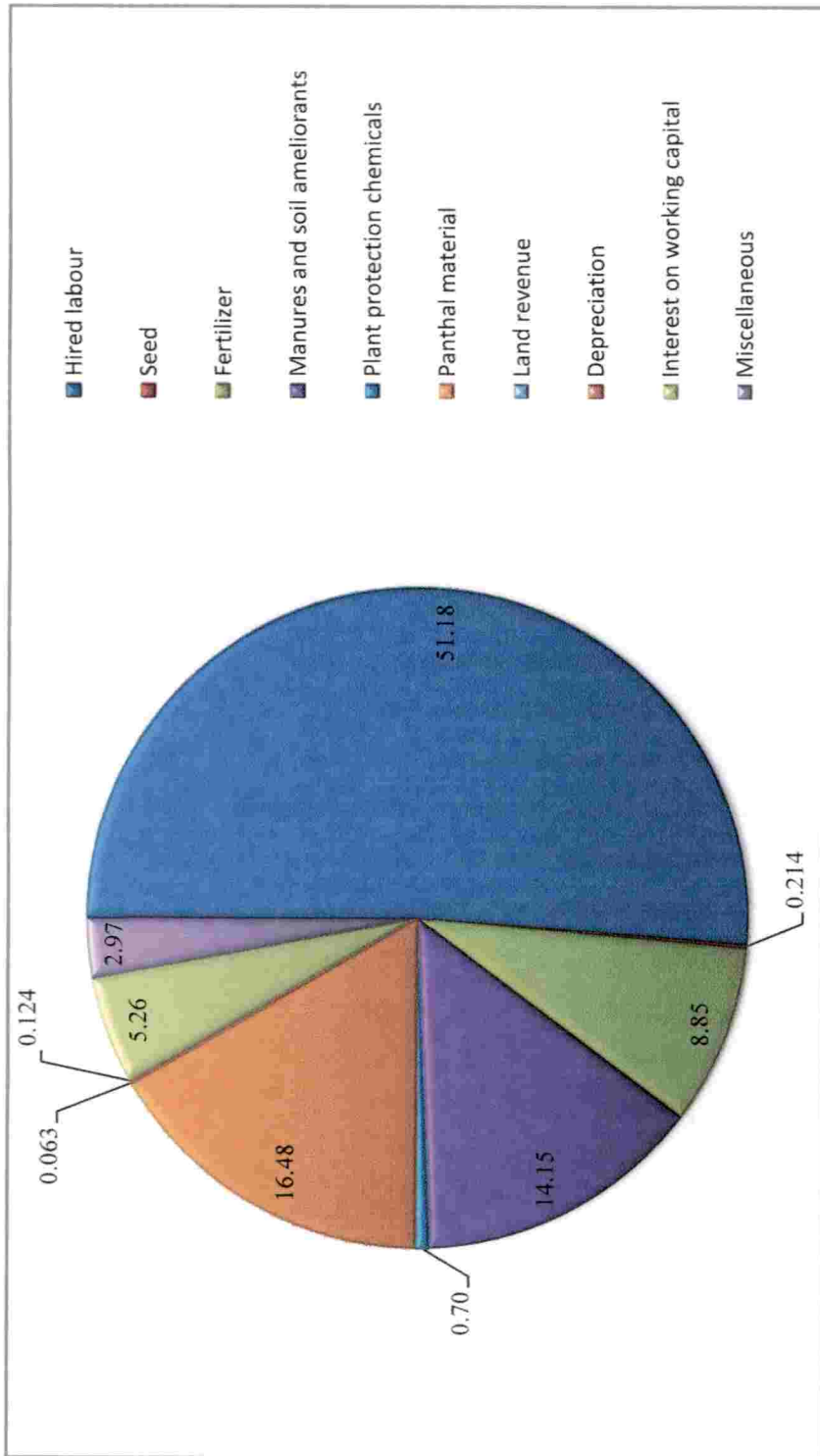
Figure 17. Cost A₁ of cucumber cultivation for non-beneficiaries

Legend:
- Hired labour
- Seed
- Fertilizer
- Manures and soil ameliorants
- Plant protection chemicals
- Panthal material
- Land revenue
- Depreciation
- Interest on working capital
- Miscellaneous

Values shown: 51.18, 0.214, 8.85, 14.15, 0.70, 16.48, 0.063, 0.124, 5.26, 2.97

Cost A_2 was found to be ₹1,49,085 ha^{-1} and Cost B was found to be ₹2,24,175 ha^{-1}. It is presented in fig 17.

The aggregate cost of cultivation was found to be ₹2,33,729 ha^{-1}, Cost A_1 was found to be ₹99,139 ha^{-1}, Cost A_2 was ₹1,45,259 ha^{-1} and Cost B was ₹2,25,429 ha^{-1}. When we consider Cost A_1 about 53.21 per cent of which is accounted by hired labour, followed by pandal material (16.94 per cent), manures and soli ameliorants (12.23 per cent), fertilizers (8.77 per cent).

4.7.4.2 Returns from cucumber and B:C ratio

The yield obtained by the beneficiaries was 5381 kg ha^{-1} with a gross returns of ₹2,42,157 ha^{-1}. The net returns at Cost A_1, Cost A_2, Cost B and Cost C were ₹1,36,937 ha^{-1}, ₹1,02,637 ha^{-1}, ₹14,846 ha^{-1} and ₹6,846 ha^{-1} respectively. The profitability was found using the B:C ratio. For the beneficiaries it was found to be as 2.30, 1.73, 1.06 and 1.02 respectively at Cost A_1, Cost A_2, Cost B and Cost C (Table 29).

Table 29. Returns and B:C ratio of Cucumber

Sl. No.	Particulars	Aggregate		
		Beneficiaries	Non-beneficiaries	Aggregate
1	Yield (kg/ha)	5381.27	5377.41	5378.95
2	Price (₹/kg)	45	45	45
3	Gross returns (₹/ha)	242157.50	241983.30	242053
4	Net returns at Cost A_1 (₹/ha)	136937.50	146898.10	142913.78
5	Net returns at Cost A_2 (₹/ha)	102637.50	92898.30	96793.80
6	Net returns at Cost B (₹/ha)	14846.50	17808.30	16623.20
7	Net returns at Cost C (₹/ha)	6846.00	9308.30	8323.20
	B:C ratio			
8	Cost A_1	2.30	2.54	2.44
9	Cost A_2	1.73	1.62	1.67
10	Cost B	1.06	1.07	1.07
11	Cost C	1.02	1.04	1.03

For non-beneficiaries the yield obtained was found to be 5377 kg ha^{-1} with a gross returns of ₹2,41,983 ha^{-1} and the net returns at Cost A$_1$ was found to be ₹1,46,898 ha^{-1} with a profitability ratio of 2.54, at Cost A$_2$ the returns was found to be ₹92,898 ha^{-1} the profitability ratio was found to be 1.62, the returns at Cost B was found to be ₹17,808 ha^{-1} with a profitability ratio of 1.07 and the returns at Cost C was ₹9,3038 ha^{-1} the profitability ratio was found to be 1.04.

The aggregate yield was found to be 5378 kg ha^{-1} with a gross income of ₹2,42,053 ha^{-1}. The net returns at Cost A$_1$ was ₹1,42,913 ha^{-1}, Cost A$_2$ was ₹96,793 ha^{-1}, Cost B was and ₹16,623 ha^{-1} and Cost C was ₹8,323 ha^{-1} respectively. The B:C ratio was found to be 2.44, 1.67, 1.07 and 1.03 respectively at Cost A$_1$, Cost A$_2$, Cost B and Cost C.

4.3.4.3. Resource use efficiency of cucumber cultivation

The resource use efficiency of worked out is presented in Table 30. The R^2 value of 0.76 explains that 76 per cent of the variation in the yield is due to the independent variables included in the model. Among the different variables manures and fertilizers was found to have positive and significant influence on yield at five per cent level of significance. A one per cent increase in the use of manures and fertilizers is found to increase returns by 0.60 per cent. Plant protection chemicals was negatively influencing the yield but not significant. The Σb_i value was found to be 1.04, means a simultaneous increase in all the independent variables by one per cent will increase the yield will by 1.04 per cent which in turn is showing constant returns to scale. The VIF was found be less hence the there was no problem of multicollinearity.

4.3.4.4 Marginal Value Productivity Analysis of cucumber

Marginal value productivity analysis was worked out and allocative efficiency was found (Table 31) and the results showed the over utilization of resources in case of hired labour and plant protection chemicals indicating that the farmers should reduce the use of this resources in order to obtain a better yield. Manures and fertilizers and family labour were found to be greater than one

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indicating under utilization of resources. Hence farmers can increase the yield by increasing the use of these resources.

Table 30. Estimated production function for cucumber cultivation

Sl. No.	Particulars	Aggregate			
		Coefficients	Standard error	P value	VIF
1	Intercept	2.789	1.974	0.216	-
2	Quantity of hired labour	0.528	0.979	0.612	1.52
3	Quantity of family labour	0.076	0.300	0.808	1.77
4	Quantity of manures and fertilizers	0.606*	0.349	0.014	1.65
5	Quantity of plant protection chemicals	-0.174	0.612	0.787	2.31
6	R^2	0.76			
7	$\overline{R^2}$	0.70			
8	Calculated F	12.49			
9	$\Sigma \, b_i$	1.04			
10	Number of observations	9			

* Significant at 5 per cent level

Note: The coefficients were obtained with log value

Table 31. MVP and MFC of different inputs used in cucumber production

Sl. No.	Particulars	Aggregate			
		Geometric mean	MVP	MFC	k = MVP/MFC
1	Yield	1005.24	-	-	-
2	Hired labour	7.80	440.52	634.5	0.69
3	Family labour	8.35	2815.19	531.25	5.29
4	Fertilizers and manures	95.79	288.05	236	1.22
5	Plant protection chemicals	2.29	-3352.13	374.23	-8.95

4.3.5 Economics of Amaranthus

4.3.5.1 Cost of cultivation of amaranthus

From the data analysed it was found that, the total cost of cultivation for the beneficiaries was ₹2,26,311 ha⁻¹ and is presented in Table 32 and fig 18. Among the different costs, Cost A₁ accounted for ₹1,07,216 ha⁻¹ out of which

60.62 per cent was accounted by hired labour followed by manures and soil ameliorants (15.58 per cent), fertilizers constituted 11.37 per cent. The Cost A_2 was found to be ₹1,37,216 ha^{-1} and Cost B was ₹2,20,051 ha^{-1}.

In case of non-beneficiaries the total cost of cultivation was found to be ₹1,66,640 ha^{-1}, Cost A_1 was found to be ₹75,374 ha^{-1}, Cost A_2 was ₹92,041 ha^{-1} and Cost B was ₹1,58,474 ha^{-1}. Out of the total Cost A_1, 64.12 per cent was accounted by hired labour, followed by manures and soil ameliorants (13.71 per cent), fertilizers (9.95 per cent). It is presented in fig 19.

The aggregate cost of cultivation was found to be ₹2,20,930 ha^{-1}, Cost A_1 was found to be ₹1,03,309 ha^{-1} of which hired labour accounted for 56.86 per cent followed by manures and soli ameliorants (20.62 per cent) and fertilizers (11.19 per cent). The Cost A_2 was ₹1,30,184 ha^{-1} and Cost B was ₹2,13,118 ha^{-1}.

4.7.5.2 Returns from amaranthus and B:C ratio

The yield obtained by the beneficiaries was 9100 kg ha^{-1} and a gross returns of ₹2,27,501 ha^{-1}. The net returns at Cost A_1, Cost A_2, Cost B and Cost C were ₹1,20,284 ha^{-1}, ₹90,284 ha^{-1}, ₹7,450 ha^{-1} and ₹1,190 ha^{-1} respectively. The profitability was found using the B:C ratio. For the beneficiaries it was found to be as 2.12, 1.65, 1.03 and 1.01 respectively at Cost A_1, Cost A_2, Cost B and Cost C (Table 33).

For non-beneficiaries the yield obtained was found to be 7555 kg ha^{-1} with a gross returns of ₹169999 ha^{-1} and the net returns at Cost A_1, Cost A_2, Cost B and Cost C were ₹94,625 ha^{-1}, ₹77,958 ha^{-1}, ₹11,525 ha^{-1} and ₹3,359 ha^{-1} respectively. The B:C ratio at Cost A_1, Cost A_2, Cost B and Cost C were 2.25, 1.84, 1.07 and 1.02 respectively.

Legend:
- Hired labour
- Seed
- Fertilizer
- Manures and soil ameliorants
- Plant protection chemicals
- Land revenue
- Depreciation
- Interest on working capital
- Miscellaneous

Values shown: 60.62, 3.5, 6.29, 0.236, 0.019, 1.72, 15.85, 11.37, 0.35
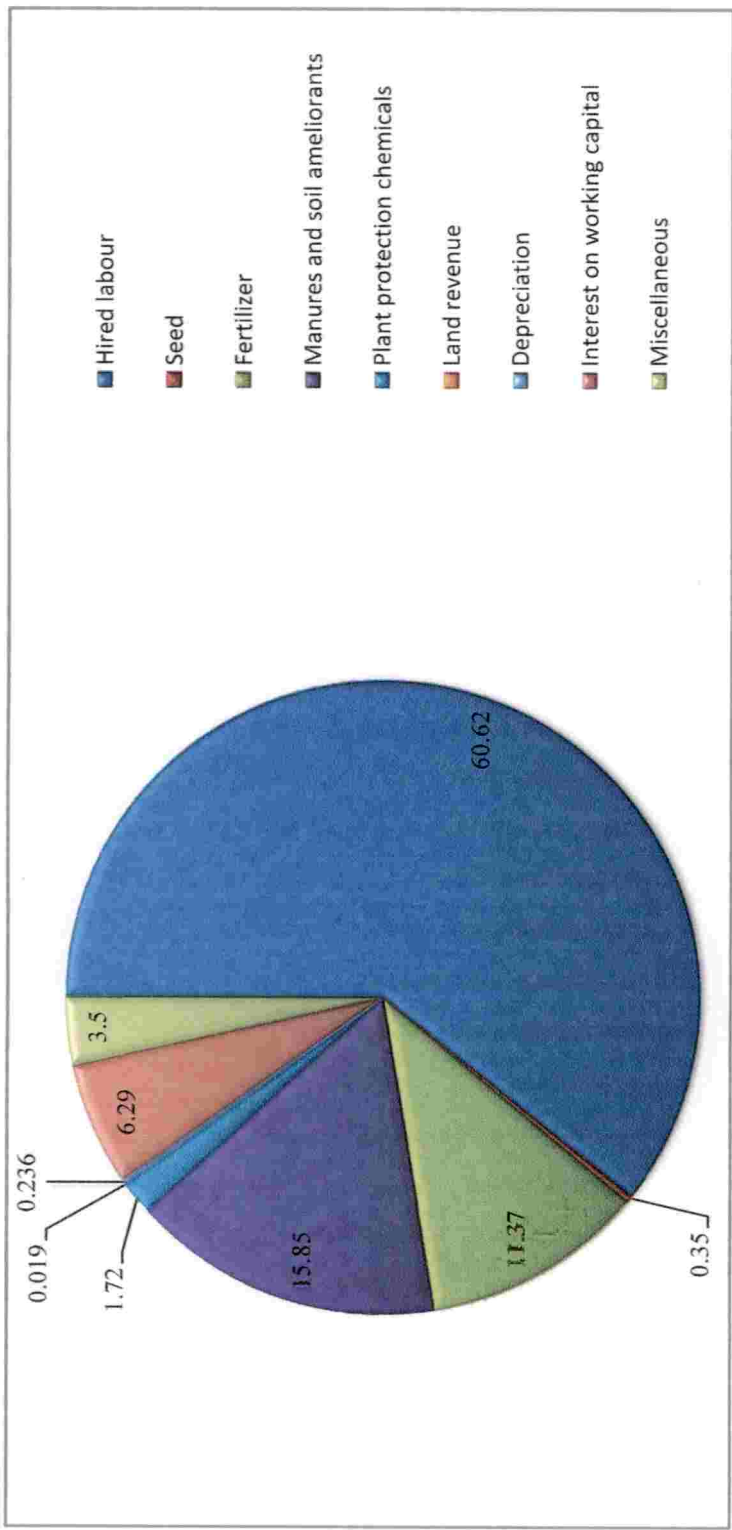
Figure 18. Cost A₁ of amaranthus cultivation for beneficiaries
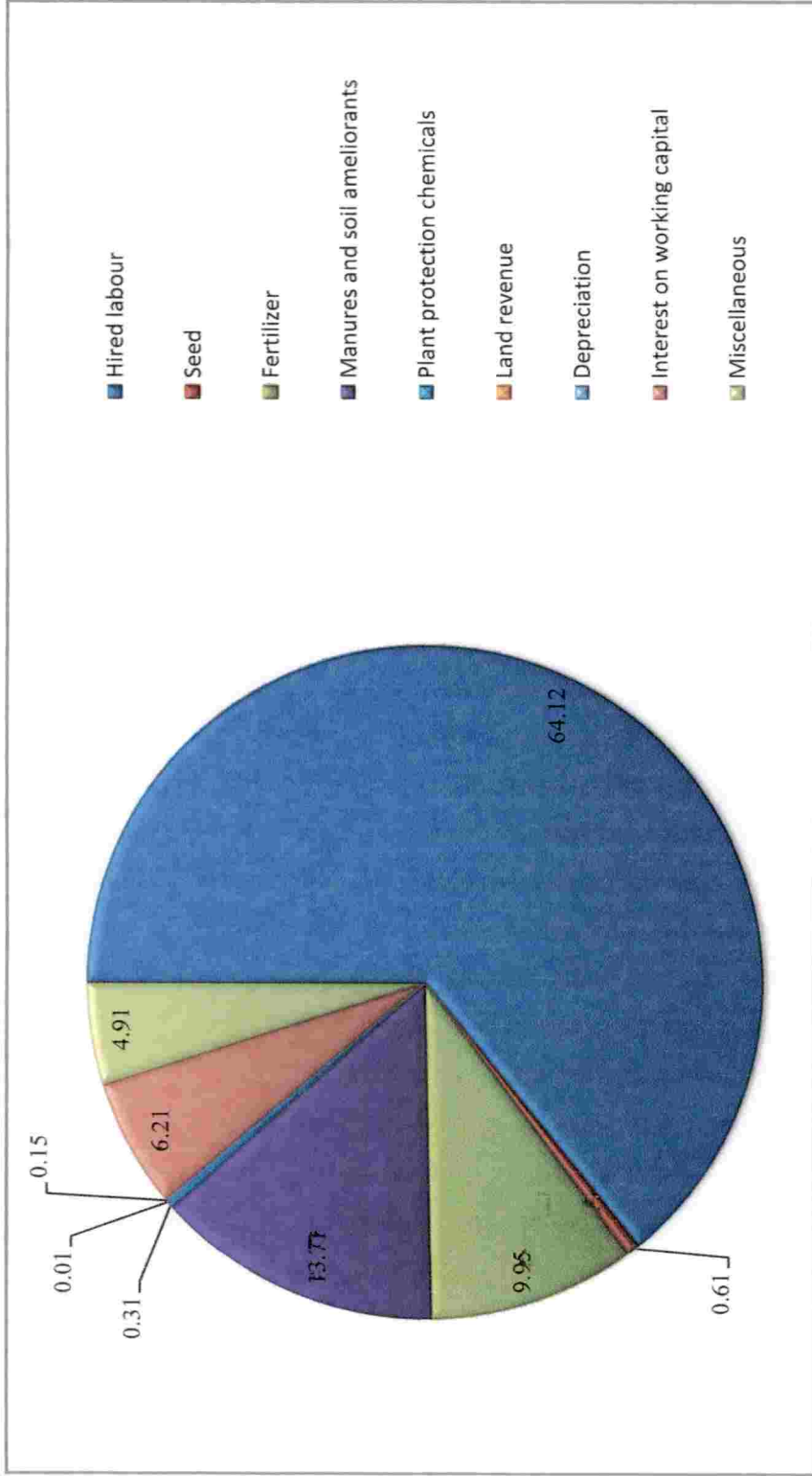
Figure 19. Cost A$_1$ of amaranthus cultivation for non-beneficiaries

Table 32. Cost of cultivation of amaranthus

Sl. No.	Particulars	Beneficiaries		Non-beneficiaries		Aggregate	
		Cost ₹/ha	Percent to cost A_1	Cost ₹/ha	Percent to cost A_1	Cost ₹/ha	Percent to cost A_1
1	Hired labour	65000	60.62	48333.3	64.12	58750	56.86
2	Seed	380	0.35	466.66	0.61	412.5	0.39
3	Fertilizer	12200	11.37	7500	9.95	11562.5	11.19
4	Manures and soil ameliorants	17000	15.85	10333.3	13.71	213125.5	20.62
5	Plant protection chemicals	1852	1.72	235	0.31	1341.25	1.29
6	Land revenue	20.68	0.019	7.52	0.01	15.75	0.015
7	Depreciation	254	0.236	118.05	0.15	203.02	0.19
8	Interest on working capital	6750.24	6.29	4680.78	6.21	5974.19	5.78
9	Miscellaneous	3760	3.50	3700	4.91	3737.50	3.61
	Cost A_1	107216.90	100	75374.69	100	103309	100
10	Rental value of leased in land	30000		16666.67		26875	
	Cost A_2	137216.90		92041.36		130184	
11	Rental value of owned land	73000		57000		73250	
12	Interest on owned fixed capital excluding land	9834.15		9432.72		9683.61	
	Cost B	220051.06		158474.07		213118	
13	Family labour	6260		8166.67		7812.5	
	Cost C	226311.07		166640.74		220930	

The aggregate yield was found to be 9083 kg ha^{-1} with a gross income of ₹2,27,083 ha^{-1}. The net returns at Cost A$_1$ was ₹1,23,774 ha^{-1} with a profitability ratio of 2.19, returns at Cost A$_2$ was ₹96,899 ha^{-1} with profitability of 1.74, returns at Cost B was ₹13,965 ha^{-1} showing a profitability ratio of 1.06 and returns at Cost C was ₹6153 ha^{-1} with profitability of 1.02.

Table 33. Returns and B:C ratio of amaranthus

Sl. No.	Particulars	Aggregate		
		Beneficiaries	Non-beneficiaries	Aggregate
1	Yield (kg/ha)	9100.05	7555.55	9083.33
2	Price (₹/kg)	25	22.5	25
3	Gross returns (₹/ha)	227501.25	169999.87	227083.25
4	Net returns at Cost A$_1$ (₹/ha)	120284.35	94625.18	123774.25
5	Net returns at Cost A$_2$ (₹/ha)	90284.35	77958.51	96899.25
6	Net returns at Cost B (₹/ha)	7450.19	11525.8	13965.25
7	Net returns at Cost C (₹/ha)	1190.18	3359.13	6153.25
B:C ratio				
8	Cost A$_1$	2.12	2.25	2.19
9	Cost A$_2$	1.65	1.84	1.74
10	Cost B	1.03	1.07	1.06
11	Cost C	1.01	1.02	1.02

4.3.6 Cost of production of different crops grown by respondents

The cost of production of the various crops was worked out, using the Cost A$_1$ (₹ ha^{-1}) and the yield obtained (kg ha^{-1}) by the respondents in order to know the cost incurred by them to produce one kilogram of the produce and is presented in Table 34.

From the analysis it is evident that at the aggregate level the cost of production was found to be higher for banana (₹25.87 kg^{-1}) followed by yard long bean (₹ 23.95 kg^{-1}), cucumber (₹18.43 kg^{-1}), amaranthus (₹11.37 kg^{-1}) and tapioca (₹9.95 kg^{-1}).When we compare the beneficiaries and non-beneficiaries it was found that the cost of production was found to be more less same for all crops
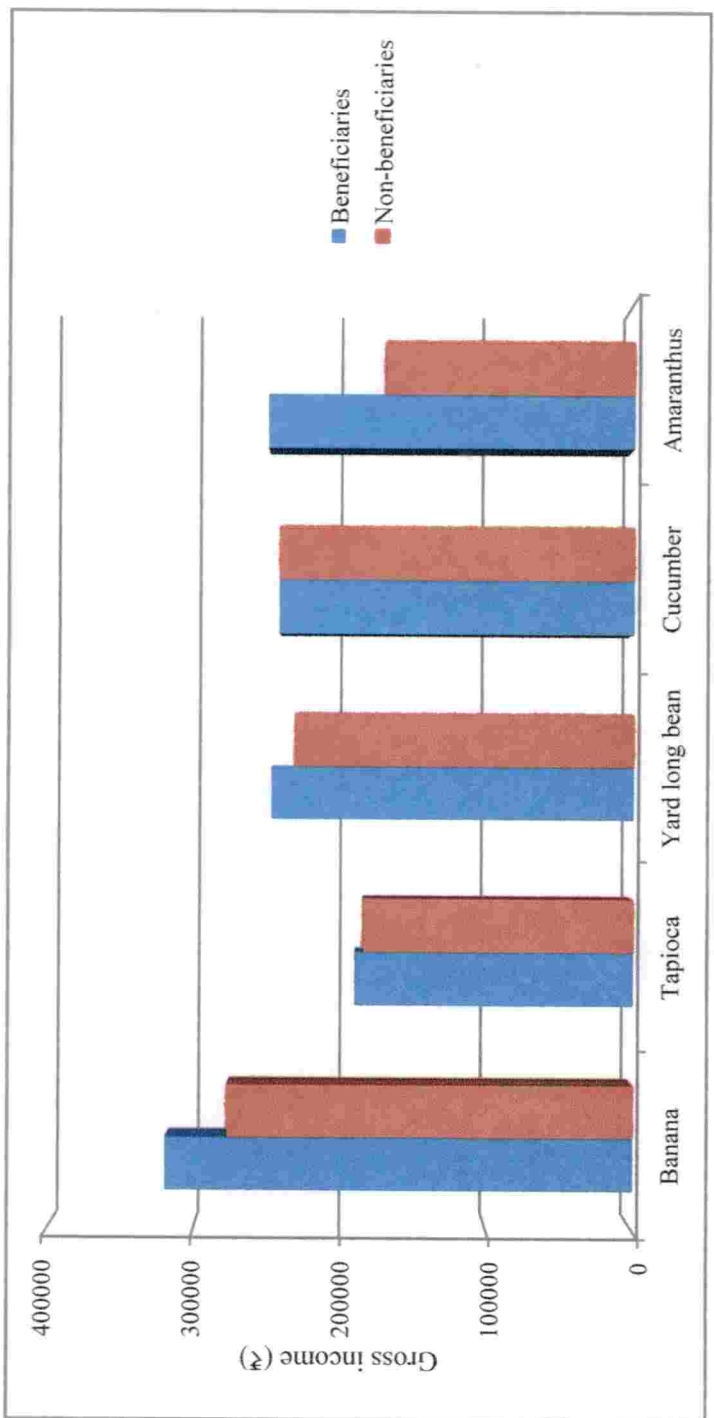
Figure 20. Gross returns from cultivation of different crops (₹ ha^{-1})
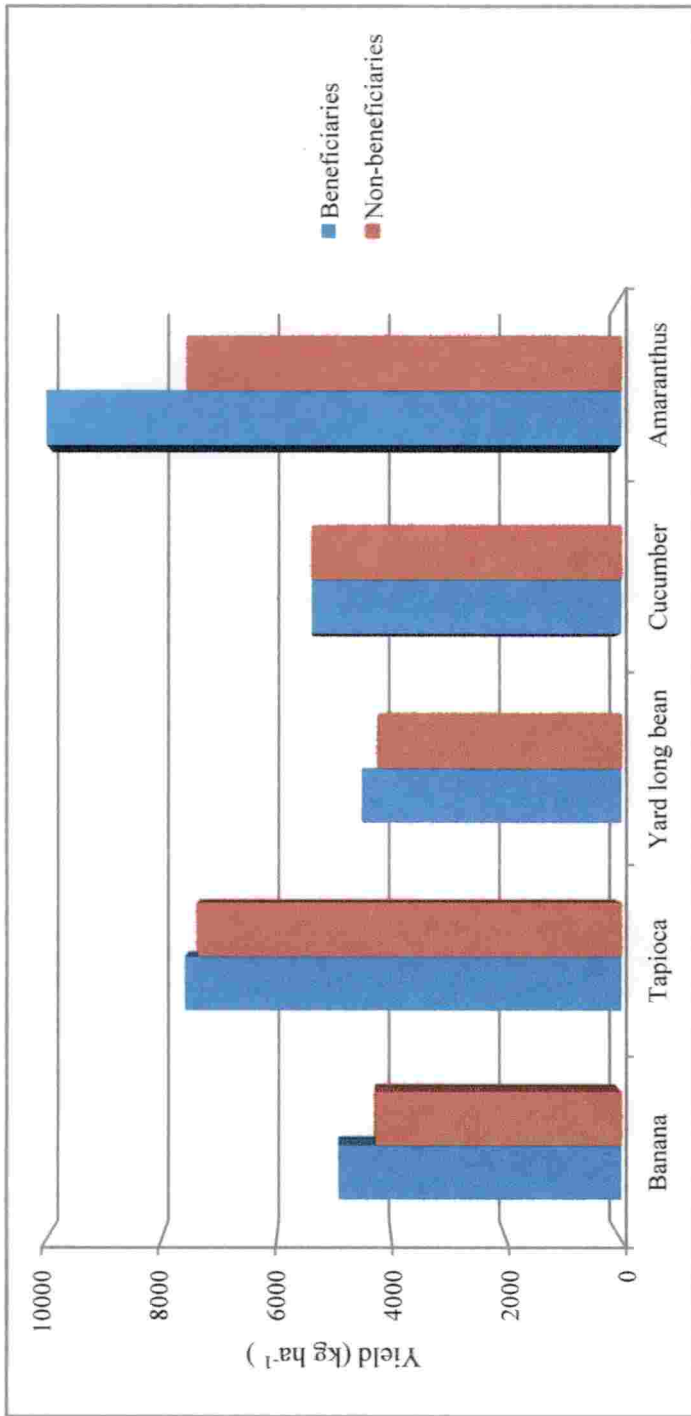
Figure 21. Yield in terms of kg ha^{-1} from cultivation of different crops
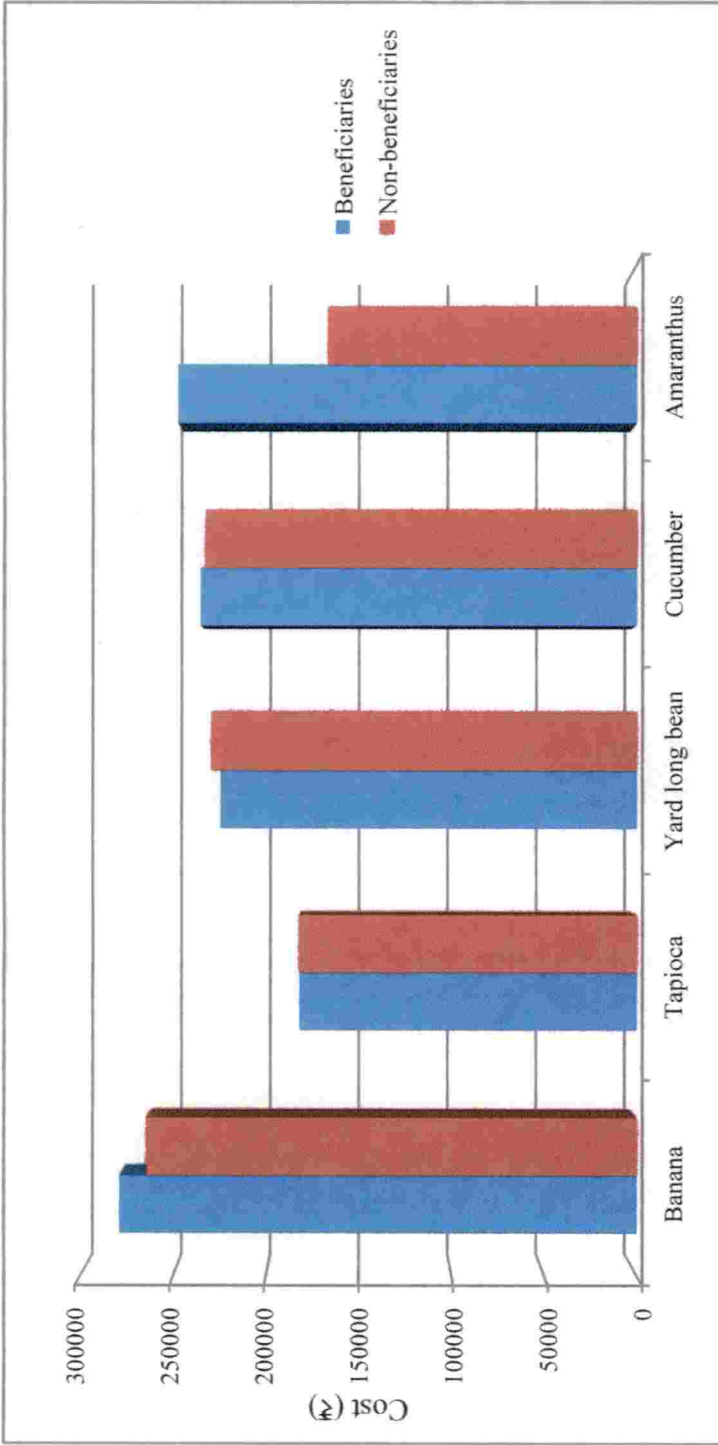
Figure 22. Total cost of cultivation (₹ ha⁻¹) for different crops

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Table 34. Cost of production of various crops

Sl.no.	Particulars	Cost of production (₹/kg)			Price (₹/kg)	Profit (₹/kg)		
		Beneficiaries	Non-beneficiaries	Aggregate		Beneficiaries	Non-beneficiaries	Aggregate
1	Banana	24.93	27.13	25.87	65	40.07	37.87	39.13
2	Tapioca	9.97	9.93	9.95	25	15.03	15.07	15.05
3	Yard long bean	23.50	24.74	23.95	55	31.5	30.26	31.05
4	Cucumber	19.55	17.68	18.43	45	25.45	27.32	26.57
5	Amaranthus	11.78	9.97	11.37	25	13.22	12.53	13.63

except for banana and yard long bean where it was found be higher for non-beneficiaries (₹27.13 kg^{-1} and ₹24.74 kg^{-1} respectively).

When the profit was worked out for different crops it was evident that banana was most profitable (₹39.13 kg^{-1}) followed by yard long bean (₹31.05 kg^{-1}), cucumber (₹26.57 kg^{-1}), tapioca (₹15.05 kg^{-1}) and amaranthus (₹13.63 kg^{-1}). The beneficiaries obtained more profit when compared to non-beneficiaries for the different crops grown except for cucumber, where the non-beneficiaries had a slightly higher profit compared to beneficiaries.

4.4 FEATURES AND CHARACTERISTICS OF KCC HOLDERS AND NON-KCC HOLDERS

4.4.1 Year of joining KCC scheme

This was considered to be one of the most important aspect related to performance of KCC and to know the acceptance of the scheme by the farmers. In the study area majority of the famers had joined the scheme when it was launched in the year 1998-99 and continued the scheme for 2-3 years and later left the scheme. But from the year 2006 many farmers started joining back to the scheme and are taking credit under it with proper renewal. This is represented in the Table 35.

Table 35. Year of joining the KCC scheme

Particulars	Year of joining			Total
	2006-2009	2009-2013	After 2013	
Beneficiaries SBI	6 (40)	7 (46.66)	2 (13.33)	15 (100)
Beneficiaries Co-operatives	6 (40)	8 (53.33)	1 (6.66)	15 (100)
Total	12 (40)	15 (50)	3 (10)	30 (100)

Note: Figures in parentheses indicate percentage to total.

The respondents were categorised three groups based on the year of joining the scheme as 2006-09, 2009-13 and after 2013. It was found that 50 per

cent of them joined the scheme during 2009-13 followed by 40 per cent during 2006-09 and only 10 per cent joined after 2013. A similar trend was observed in case of beneficiaries of SBI and Co-operative bank.

4.4.2 Source of information

Source of information about the scheme to the farmers is presented in the Table 36 and the major sources of information was found to be from the bank, Krishi Bhavan, Horticorp and VFPCK. Around 50 per cent of respondents obtained information from Krishi Bhavan followed by 33.33 per cent from banks as a source and 13.33 per cent from Horticorp. If we consider beneficiaries of SBI and Co-operative banks, 66.66 per cent of both sought information from Krishi Bhavan and from the banks respectively. Whereas in case of beneficiaries of SBI 26.6 per cent sought information from Horticorp and among respondents of Co-operative banks 33.33 per cent sought information from Krishi Bhavan.

Table 36. Source of information to the beneficiaries

Sl. no.	Sources	Beneficiaries SBI	Beneficiaries Co-operatives	Total
1	From the bank	-	10 (66.66)	10 (33.33)
2	Krishi Bhavan	10 (66.66)	5 (33.33)	15 (50.00)
3	Horticorp	4 (26.66)	-	4 (13.33)
4	VFPCK	1 (6.66)	-	1 (3.33)
5	Total	15 (100)	15 (100)	30 (100)

Note: Figures in parentheses indicate percentage to total.

A similar study by Nargaven (2010) and Dhanbhakyam and Malarvizhi (2012) were in conformity with the present study stating agricultural offices as a main source of information.

4.4.3 Amount applied for loan by the beneficiaries

Under KCC the credit limit was set to ₹1 lakh for short term loans which is also called as crop loans, an amount of ₹3 lakh as limit for medium term loans

and ₹5 lakh as limit for long term loans. In the study area it was found that majority of the beneficiaries were availing only short term loans. After a query with bank officials of that area it was found that an amount upto ₹3 lakh is considered as short term loans and for which external security was required and for amount less than ₹1 lakh only hypothecation of crop was sufficient. This might be one of the reason for the farmers to avail only crop loan upto an amount of ₹1 lakh. Loan amount of more than ₹5 lakh was sanctioned in that area initially for small agro-based industries and now they are not sanctioning any long term loan under KCC since the introduction of Micro Unit Development and Refinance Agency (MUDRA) scheme in 2015 and also due to decrease in the demand for those loans. The details is Table 37.

Table 37. Average amount applied for loan under KCC

Particulars	Amount of applied for loan (₹)			Total	Average amount applied for loan (₹)
	<25000	25000-50000	>50000		
Beneficiaries SBI	1 (6.66)	6 (40)	8 (53.33)	15 (100)	69333.33
Beneficiaries Co-operative	4 (26.66)	7 (46.66)	4 (26.66)	15 (100)	52000.00
Total	5 (16.66)	13 (43.33)	12 (40)	30 (100)	60666.66

Note: Figures in parentheses indicate percentage to total.

For the sake of analysis respondents were classified under three groups as those applying for loan amount of <₹25,000, ₹25,000-50,000 and >₹50,000. The result showed that the average amount applied for loan was ₹60,666.66 and in case of beneficiaries of SBI it was found to be ₹69,333.33 and in case on beneficiaries of co-operative banks it was ₹52,000. It was found that 43.3 per cent of the respondents applied for an amount of ₹25,000-50,000 followed by 40 per cent of them applied for >₹50,000. If we consider beneficiaries of SBI 53.33 per cent applied for >₹50000 and 40 per cent applied for ₹ 25,000-50,000. In case of

beneficiaries of Co-operative bank 46.6 per cent applied for ₹25,000-50,000 followed by 26.66 per cent each applied for <₹25,000 and >₹50,000 respectively.

4.4.4 Rate of interest for different loans

Rate of interest for different loans availed by the beneficiaries from both the financial institutions and various types of loans availed are presented in Table 38. Apart from KCC loans respondents also availed other loans like the agri-gold loan, housing loan and vehicle loan. It could be seen that cent per cent respondents availed short term loans, whereas 36.6 per cent each of the total respondents availed housing loan and vehicle loan respectively followed by 16.66 per cent of them availed agri-gold loan. In case of beneficiaries of SBI 33.3 per cent of them availed agri-gold loan followed by 26.6 per cent had taken housing loan. Under the beneficiaries of Co-operative bank 46.6 per cent of them availed housing loan followed by 26.6 per cent had availed for vehicle loan.

Table 38. Rate of interest for different loans and number of beneficiaries availing different loans from commercial and co-operative banks

Sl. No.	Type of loan	SBI	Co-operative	Beneficiaries SBI	Beneficiaries Co-operatives	Total
1	Short term loan	7 %	7%	15 (100)	15 (100)	30 (100)
2	Agri-gold loan	9.25%	-	5 (33.33)	-	5 (16.66)
3	Housing loans	8.35%	9%	4 (26.66)	7 (46.66)	11 (36.66)
4	Vehicle loans	9.25%	11%	2 (13.33)	4 (26.66)	11 (36.66)

Note: Figures in parentheses indicate percentage to total.

The results of the study by Meena and Reddy (2013) showed that 61.67 per cent of farmers felt that the rate of interest was higher under the KCC scheme.

4.4.5 Renewal of KCC

In the study area it was found that famers who availed credit under KCC when the scheme started, did not renew their accounts and hence accounts became Non Performing Accounts (NPA). So the transactions in that account became nil.

Farmers rejoined the KCC scheme during 2006 and there after followed a regular renewal and transactions were carried regularly. This might be because of the additional benefits of the scheme like PAIS and also coverage under the crop insurance scheme. This is presented in the Table 39. The average number of renewal was found to be 5.73 times. It was also found that a total of 43.3 per cent of respondents renewed 5-7 times followed by 40 per cent of them renewing <5 times. In case of beneficiaries of SBI 46.6 per cent respondents renewed <5 times followed by 40 per cent of them renewed 5-7 times. In case of beneficiaries of Co-operative bank 46.6 per cent of them renewed 5-7 times followed by 33.3 per cent of them renewed <5 times.

Table 39. Number of renewals of KCC

Particulars	Number times of renewal			Total	Average number of times of renewal
	< 5 times	5-7 times	> 7 times		
Beneficiaries SBI	7 (46.6)	6 (40)	2 (13.33)	15 (100)	5.53
Beneficiaries Co-operatives	5 (33.33)	7 (46.66)	3 (20)	15 (100)	5.93
Total	12 (40)	13 (43.33)	5 (16.66)	30 (100)	5.73

Note: Figures in parentheses indicate percentage to total.

Prakash (2013) reported that the tendency of farmers in taking the KCC loans a number of times over a period of ten years was found, 45 per cent of the KCC holders availing credit 4-8 times and only 35 per cent of the holders availing credit more than 8 times from the commercial banks.

4.4.6 Procedural formalities involved in taking loan, mode of withdrawal, repayment by behaviour and mode of repayment

The mode of withdrawal, repayment by the beneficiaries and the mode of repayment of loans are presented in the Table 40. The time taken for completing the procedure to avail KCC was two weeks which is ideally well for the farmers.

In case withdrawal of the sanctioned credit the farmers in the survey area withdraw in lumpsum from the respective banks and keep it in a co-operative society from where they withdraw the amount as when the need arises. In case repayment the entire amount is repaid in lumpsum to the banks from which it was withdrawn.

Table 40. Mode of withdrawal, repayment by beneficiaries and mode of repayment of loans

Sl. No.	Particulars		Beneficiaries SBI	Beneficiaries Co-operatives
1	Time taken for completing the procedure	One week	-	-
		Two weeks	15 (100)	15 (100)
2	Mode of withdrawal	Lumpsum	15 (100)	15 (100)
		Instalments	-	-
3	Repayment by beneficiaries	Completely repaid	8 (53.33)	8 (53.33)
		Partially repaid	7 (46.66)	7 (46.66)
4	Mode of repayment	Lumpsum	15 (100)	13 (86.66)
		Instalments	0	2 (13.33)
5	Frequency of repayment	Half yearly	-	-
		Yearly	15 (100)	15 (100)
6	Source of repayment	From the earnings for which loan was taken	15 (100)	15 (100)
		From the loans taken for other purpose	-	-
7	Ability to repay the loan	Yes	11 (73.33)	13 (86.6)
		No	4 (26.66)	2 (13.33)
8	Entire amount of credit was repaid last year	Yes	11 (73.33)	13 (86.6)
		No	4 (26.66)	2 (13.33)
9	Difficulties in taking loan	Yes	-	-
		No	15 (100)	15 (100)

Note: Figures in parentheses indicate percentage to total.

It was evident that 53.33 per cent of the beneficiaries had completely repaid the loan amount whereas 46.66 per cent beneficiaries made the partial repayment of the amount. The beneficiaries made annual repayment of loans.

The beneficiaries in the study area were able to repay the loan amount from the earnings for which the loan was taken. About 73.33 per cent of the beneficiaries of SBI were able to repay the loan amount completely and 26.6 per cent were not able to repay the entire amount of loan which indicates the diversion of the credit and mis-utilization of the amount sanctioned. Among the beneficiaries of Co-operatives 86.6 per cent respondents were able to repay the entire amount and remaining 13.33 per cent were not able to repay the entire loan amount.

In the opinion of the respondents availing loan under KCC was not that difficult as compared to the other loan procedures.

In context to a study by Prakash (2013) and Sangitha (2007) showed that there was lumpsum withdrawal pattern followed by beneficiaries from all the institutional sources. Similar study by Sekhon (2010) and Dawar (2011) showed about 36.96 per cent of the respondents were regularly repaying the loan.

4.4.7 Crop loans (KCC) and General agricultural credit

This is presented in the Table 41. It was found that very few non-beneficiaries of KCC applied for the general agricultural credit both in SBI and Co-operative bank. This is because the rate of interest is higher and there is no interest subvention as is in the case of KCC.

The average amount sanctioned in SBI under KCC was ₹69,333 and in case of Co-operative bank it was found to be ₹52,000. There was complete utilization of the credit by the beneficiaries of Co-operative banks, in case of SBI 94.23 per cent of the loan amount was utilized which shows remaining 5.76 per cent of the mis-utilization of the credit. Majority of the farmers repaid the amount

Table 41. Crop loan (KCC) and the General Agricultural credit details

Sl. No.	Particulars	Crop loan (KCC)		General agricultural credit	
		Beneficiaries SBI	Beneficiaries Co-operatives	Non-beneficiaries (SBI)	Non-beneficiaries (Co-operatives)
1	Number of farmers	15 (100)	15 (100)	5 (33.33)	1 (6.66)
2	Avg. amount sanctioned (₹)	69333.33	52000	60000	75000
3	Avg. loan amount utilized (₹)	65333.33 (94.23)	52000 (100)	43400 (72.33)	75000 (100)
4	Avg. loan amount partially utilized (₹)	4000 (5.76)	-	16600 (27.66)	-
5	Avg. amount repaid (₹)	57521.33 (82.96)	50333.33 (96.79)	37600 (62.66)	75000 (100)
6	Avg. amount overdue (₹)	11812 (17.04)	1666.67 (3.21)	22400 (37.33)	-
7	Actual rate of interest	7		9.25	

Note: Figures in parentheses indicate percentage to total.

on time because they get an interest subvention of 3 per cent and also by this they can gain the confidence of the bankers for loans in the future. In case beneficiaries of SBI, 82.96 per cent of the loan amount was repaid and 17.04 per cent of the loan amount was overdue in case of beneficiaries, whereas in case of beneficiaries of Co-operative banks 96.79 per cent of the loan amount was repaid and 3.21 per cent of the loan amount was left overdue.

Under general agricultural credit only 6.6 per cent of the non-beneficiaries of KCC under Co-operative banks availed credit. The average amount sanctioned was ₹75,000 and the entire amount was utilized completely and also repaid fully. In case of respondents of SBI, 33.3 per cent of them availed credit, 72.3 per cent of the loan amount was utilized and 27.7 per cent was partially utilized and 62.6 per cent of the loan amount was repaid and 37.4 per cent was left overdue.

4.4.8 Agri-gold loans

Some of the beneficiaries along with KCC credit has availed for the agri-gold loans and the details of it presented in Table 42. These loans are provided only by the SBI and not the Co-operative banks because Co-operative bank provides agriculture loans only under KCC and in specific as short term loans and all other loans are considered as general loans.

Table 42. Agri-gold loans taken by beneficiaries and non-beneficiaries of SBI

Sl.no	Particulars	Beneficiaries (SBI)	Non- beneficiaries (SBI)
1	Number of farmers	5	9
2	Avg. amount sanctioned (₹)	75000	58333.33
3	Avg. loan amount utilized (₹)	60000 (80)	43333.33 (74.3)
4	Avg. loan amount partially utilized (₹)	15000 (20)	15000 (25.7)
5	Avg. amount repaid (₹)	38912 (51.8)	31555.55 (54.1)
6	Avg. amount overdue (₹)	36088 (48.2)	26777.77 (45.9)
7	Actual rate of interest	9.25	

Note: Figures in parentheses indicate percentage to total.

The average amount sanctioned to the beneficiaries of SBI was ₹75,000 and for the non- beneficiaries of KCC it was ₹58,333. It was found that 80 per cent of the loan amount was utilized and 20 per cent was partially utilized and 51.8 per cent of the borrowed amount was repaid and 48.2 per cent was left overdue. In case of non-beneficiaries 74.3 per cent of the amount was utilized and 25.7 per cent of it was partially utilized and 54.1 per cent of the loan amount was repaid and 45.9 per cent was left overdue.

4.4.9 Other loans taken by the beneficiaries and non-beneficiaries

From the Table 43. it is evident that, beneficiaries availing housing loan is higher than the vehicle loans. The consumption loan and the general gold loan was taken only by the non-beneficiaries. It can be seen that 20 per cent of beneficiaries and 33.33 per cent of non-beneficiaries availed vehicle loan. Average amount sanctioned under for the two categories was ₹54,250 and ₹56,250 respectively. Utilization of the loan was found to be 91.5 per cent in case of beneficiaries and 88.45 per cent in case of non-beneficiaries and 51.6 per cent of the loan amount was repaid by beneficiaries and non-beneficiaries had repaid 68.3 per cent of the loan amount.

If we speak of housing loan 36.6 and 33.3 per cent of beneficiaries and non-beneficiaries respectively had availed the loan. The average amount sanctioned was found to be ₹71,7363.63 and ₹51,500 for beneficiaries and non-beneficiaries respectively. It was evident that 86.23 per cent of the loan amount utilized beneficiaries and 0.89 per cent of the credit was not-utilized. In case of non-beneficiaries 98.67 per cent of the loan amount was utilized. With regards to repayment of loan 63.5 per cent and 65.8 per cent of the loan amount was repaid by beneficiaries and non-beneficiaries respectively.

When we consider consumption loans and general gold loans, these loans were availed only by the non-beneficiaries. 10 per cent of them availed consumption loans and only 3.3 per cent availed general gold loan. The average

Table 43. Other loans taken by beneficiaries and non-beneficiaries

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Sl. No.	Particulars	Vehicle loan		Housing loan		Consumption loan	General gold loan
		Beneficiaries	Non-beneficiaries	Beneficiaries	Non-beneficiaries	Non-beneficiaries	Non-beneficiaries
1	Number of farmers	6 (20)	10 (33.33)	11 (36.66)	10 (33.33)	3 (10)	1 (3.33)
2	Avg. amount sanctioned (₹)	54250	56250	717363.63	515000	58333.33	55000
3	Avg. loan amount utilized (₹)	49666.66 (91.55)	49750 (88.45)	618636.36 (86.23)	508200 (98.67)	32666.66 (56)	45000 (81.81)
4	Avg. loan amount partially utilized (₹)	4583.33 (8.44)	6500 (11.55)	92318.18 (12.87)	6800 (1.33)	15666.67 (26.87)	10000 (18.18)
5	Avg. loan amount not utilized (₹)	-	-	6409.09 (0.89)	-	10000 (17.13)	-
6	Avg. amount repaid (₹)	28000 (51.61)	38420 (68.30)	455590.90 (63.50)	339050 (65.84)	26133.33 (44.8)	55000 (100)
7	Avg. amount overdue (₹)	26250 (48.38)	17830 (31.69)	261772.72 (36.49)	175950 (34.16)	32200 (55.2)	-
8	Actual rate of interest	9.25		8.35		12	9

amount sanctioned under both the loans was found to be ₹58,333.3 and ₹55,000 respectively for consumption loan and general gold loan.

4.4.10 Details on various types of loans

The beneficiaries and non-beneficiaries of both the credit institutions (SBI and Co-operative bank) has taken different kinds of loans and the average amount sanctioned under each of the loans in presented in Table 44. In case of beneficiaries the total amount sanctioned under various loans was found to be ₹9,67,946.93, out of which 74.11 per cent was accounted by housing loans followed by 12.53 per cent under crop loan/KCC loan, agri-gold loan and vehicle loan accounted for 7.74 and 5.62 per cent respectively. In case of beneficiaries the total amount sanctioned under different loans was found to be ₹8,77,916.66.

A similar trend was observed in loan availing pattern of non-beneficiaries with maximum percentage for housing loan (58.66 per cent) followed by general agricultural credit (15.37 per cent), agri-gold loan and consumption loan accounting for 6.64 per cent, vehicle loan (6.43 per cent) and general gold loan (6.26 per cent).

Table 44. Average amount sanctioned under different kinds of loans

Sl. No.	Particulars	Average amount of loan sanctioned (₹)	
		Beneficiaries	Non- beneficiaries
1	Crop loan/KCC	1,21,333.30 (12.53)	-
2	General agricultural credit	-	1,35,000.0 (15.37)
3	Agri-gold loan	75,000.00 (7.74)	58,333.33 (6.64)
4	Vehicle loan	54,250.00 (5.62)	56,250.00 (6.43)
5	Housing loan	7,17,363.63 (74.11)	5,15,000.00 (58.66)
6	Consumption loan	-	58,333.33 (6.64)
7	General gold loan	-	55,000.00 (6.26)
8	Total (₹)	9,67,946.93 (100)	8,77,916.66 (100)

Note: Figures in parentheses indicate percentage to total.

4.5 ADEQUACY OF THE CREDIT UNDER KCC

The adequacy of credit for each crop grown by the farmers was calculated and presented in the Table 45. The scale of finance was taken by from Annexure 2-1 of the report PMFBY Rabi 1 2016-17 season (Anonymous, 2017). Scale of finance was compared with Cost A_2 and Cost C for the various crops and adequacy was worked out and presented in table 45. When Cost A_2 was compared with the scale of finance, for all the crops grown by respondents the credit was found to be adequate and it follows the order amaranthus (-45.47 per cent), banana (-23.03 per cent), yard long bean (-11.40 per cent), cucumber (-10.32 per cent) and tapioca (-2.55 per cent).

It was found that when we compare Cost C with scale of finance, only in case of tapioca the credit was found to be found inadequate with a gap of 2.91 per cent. The other crops like banana, yard long bean, cucumber and amaranthus, the credit was found to be adequate with the values -14.81, -4.53, -3.79 and -1.72 per cent respectively.

Similar study by Bindage *et al* (2014) showed the inadequacy of credit for the cultivation of sugarcane crop. Another study by Rameshkumar and Alexpandi (2017) also proved the inadequacy of credit for the respondents.

4.6 COST OF CREDIT TO THE BENEFICIARIES

The cost of credit was computed for an equivalent amount of ₹50,000 as loan and presented in the Table 46. The total cost of credit consists of interest cost and non interest cost and it was worked out to 7.2 and 7.4 per cent respectively for beneficiaries of SBI and Co-operatives. Eventhough the rate of interest was the same for beneficiaries and non-beneficiaries. The total Non-Interest cost (NIC) for the beneficiaries of SBI was ₹123.27 and that of the Co-operative was ₹206.23 which included the membership fees of ₹100 for the lifetime.

A study by Jainuddin *et al*, (2015) indicated that the non-interest cost of credit was found to be higher for the respondents obtaining credit through

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Table 45. Adequacy of credit to the KCC beneficiaries

Sl. No.	Crop	Avg. cost of cultivation		Scale of finance (₹/ha)	Credit gap		Percent of credit gap	
		Cost A_2	Cost C		Cost A_2	Cost C	Cost A_2	Cost C
1	Banana	158142.4	278787.8	496100	-337957.6	-217312.2	-23.03	-14.81
2	Tapioca	100017.7	180205.2	137500	-37482.3	42705.2	-2.55	2.91
3	Yard long bean	123647.1	224430.2	290950	-167302.9	-66519.8	-11.40	-4.53
4	Cucumber	139520.2	235311.0	290950	-151429.7	-55639	-10.32	-3.79
5	Amaranthus	137216.9	226311.07	251680	-114463.1	-25368.93	-45.47	-1.72

co-operative banks as compared to the commercial banks (₹1,483 and ₹1,534 respectively). Sajane (2010) also concluded that the non-interest cost of credit was higher for small farmers category under KCC and non-KCC groups.

Bista *et al.* (2012) also showed that for non-KCC holder incurred more cost when compared to the KCC holders. Prakash (2013) found that the non-interest cost of credit was found to be higher for the respondents of co-operative banks for taking loans under KCC when compared to the respondents of commercial banks and the respondents of RRBs did not incur any cost in availing credit under KCC.

Table 46. Cost of credit for beneficiaries

Sl. No.	Particulars	Beneficiaries SBI	Beneficiaries Co-operatives
1	Average amount borrowed per form (₹)	50000	50000
2	Travel cost (₹)	48.27	46.23
3	Documentation cost (₹)	75	60
4	Membership (₹)	-	100
5	Total NIC (₹)	123.27	206.23
6	Interest cost (₹)	3500	3500
7	Total cost (₹)	3623.27	3706.23
8	Total cost as percent of amount borrowed (%)	7.2	7.4

4.7 CREDIT REQUIREMENT OF THE RESPONDENTS

In order to know the credit requirements of the farmers ordinary least square estimates was performed. The credit requirement was considered as the dependent variable wherein the amount of credit required by the farmers for different purposes were taken and other variables like cost of cultivation incurred in growing different crops by the respondents, amount of consumption loan taken, loan for farming operations (KCC credit, general agricultural credit and agri-gold loans) and loan for non-farming operations (vehicle loan, housing loan,

consumption loan and general gold loan) were considered as the independent variables. It presented in Table 47.

From the table it is evident that cost of cultivation and loan for non-farming operations was found to be significant at 5 per cent level of significance and are influencing the credit requirement of the respondents positively. The t-values for all the variables was found to be significant. The coefficient of multiple determination (R^2) was found to be 0.86, which means 86 per cent of the credit requirement is explained by the variables considered in the model. Hence it was found that cost of cultivation and loan for non-farming operations influence more on the credit requirement of the respondents.

Table 47. Credit requirements of the respondents

Sl.no.	Variable	Coefficient	Standard error	t-value	VIF
1	Intercept	11.13	2.92	3.81	-
2	Cost of cultivation	0.33*	0.24	7.51	1.12
3	Consumption loan	0.34	0.12	3.11	1.23
4	Loan for farming operations	0.32	0.05	5.87	1.33
5	Loan for non-farming operations	0.36*	0.03	10.8	1.16
6	R^2	0.86			

*Significant at 5 per cent level of significance

4.8 CONSTRAINTS FACED BY BENEFICIARIES AND SUGGESTIONS ABOUT THE SCHEME

4.8.1 Constraints faced by the beneficiaries

In order to delineate the constraints the perception of farmers regarding the various aspects of scheme was analysed and presented in the Table 48. The major constraints faced by the farmers were regarding the repayment schedule, procedural formalities involved and duration of loan.

Under KCC the loans are disbursed to the respondents at the rate of 7 per cent, an interest subvention of 3 per cent is given to such respondents who repay

the loan amount on time or before the due date of the loan. The actual rate of interest will be 4 per cent to the respondents who repay the loan amount on time. Hence the beneficiaries were satisfied. If in case the loan amount is not repaid on time then the respondents has to pay a normal interest rate and then renew their KCC account.

Repayment schedule is a big problem for the farming community as it might be repaid in a lumpsum or in instalments depends on the kind of KCC loan taken and the kind of crop grown. The repayment should always co-inside with harvest and sale of crops produced so that it will not create any extra burden on the farmers. The KCC loan should be repaid within in one season or one year whichever is earliest. In case of repayment schedule, 80 per cent of beneficiaries of SBI found it moderately flexible, which means the farmers are able to repay the amount according to the prevailing conditions and 86.67 per cent of beneficiaries of Co-operative bank found the repayment schedule was low flexibility means the farmers were finding difficulty in repaying the loan at a specified date or even on their wish but within the due date which may be due to small size of the land holding, the quality and the quantity of the inputs used in the cultivation etc.

In availing the credit under KCC some procedural formalities involved, which differ from commercial bank and co-operative banks in one of aspects. In case of co-operative banks the farmers should first possess a membership in the bank after that he/she will be eligible for availing any kind of credit from the bank. About 93.3 per cent of beneficiaries of SBI found it satisfactory and cent per cent of beneficiaries of Co-operative bank found the procedural formalities was non satisfactory because it takes so much time for the farmers to obtain the land holding details from the village offices and also there is problem of transportation for few respondents and waiting in bank, the response of the officials etc will cause procedural formalities non-satisfactory.

The duration of loan plays an important role in distributing credit to the respondents. Under the KCC two kinds of loans are sanctioned viz., short duration

of crop loan and long duration loan. But majority of the respondents take only the crop loans, the duration of which depends on the type of crop grown by the respondents. For the annual crops the duration will be one year and for perennial crops it depends on the type of crop grown. The duration of the loan was found to

Table 48. Constraints faced by beneficiaries with regards to KCC scheme.

Sl.no.	Particulars		Beneficiaries SBI	Beneficiaries Co-operatives
1	Rate of interest	High	-	-
		Moderate	-	-
		Low	15 (100)	15 (100)
2	Present credit limit	Adequate	11 (73.33)	13 (86.67)
		Inadequate	4 (26.67)	2 (13.33)
3	Behaviour of employees in the bank	Very good	-	-
		Good	15 (100)	15 (100)
		Not good	-	-
4	Repayment schedule	Highly flexible	2 (13.3)	-
		Moderately flexible	12 (80)	2 (13.33)
		Low flexibility	1 (6.7)	13 (86.67)
5	Procedural formalities	Satisfactory	14 (93.3)	-
		Non satisfactory	1 (6.7)	15 (100)
6	Duration of loan	Adequate	13 (86.67)	15 (100)
		Inadequate	2 (13.33)	-
7	About the scheme	Very good	-	-
		Good	15 (100)	15 (100)
		Not good	-	-
8	Renewal procedure	Very good	-	-
		Good	15 (100)	15 (100)
		Not good	-	-
9	Timeliness of credit	Timely available	15 (100)	15 (100)
		Not timely available	-	-
10	Viability of the scheme	Viable	15 (100)	15 (100)
		Not viable	-	-
11	Improvement of agricultural development with the scheme	Yes	15 (100)	15 (100)
		No	-	-

Note: Figures in parentheses indicate percentage to total.

be adequate by cent per cent of the beneficiaries of Co-operative bank whereas only 86.67 per cent of beneficiaries of SBI found the duration to be adequate and the remaining 13.33 per cent found the duration to be inadequate. This might be because the crops grown by them are might be of six to nine months which might be a problem for the respondents.

In the opinion of the beneficiaries the aim of the KCC scheme ie., timely availability of hassle free credit was fulfilled by the implementation of the scheme in the locality of the respondents thereby enabling them to adopt new technologies and better quantity and quality on inputs for cultivation leading to improvement in agriculture. Moreover the scheme was found to be viable in the area of study which is indicated by proper repayment and renewal of the scheme.

4.8.2 Suggestion about the scheme

The suggestions of the respondents about the scheme were noted and presented in Table 49. On the whole the KCC beneficiaries were contended with the scheme and their major suggestions were regarding enhancing the credit limit considering the family expenses and to extend of validity of the card upto 5 years. The respondents were of the opinion that the annual renewal should be removed and renewal should also be once in five years which was expressed by 73.33 per cent and 60 per cent of SBI beneficiaries and co-operative beneficiaries of KCC.

Table 49. Suggestions about KCC scheme

Particulars	Credit limit to be increased considering family expenses	Extent of validity of card up to 5 years	Total
Beneficiaries SBI	4 (26.66)	11 (73.33)	15 (100)
Beneficiaries Co-operatives	6 (40)	9 (60)	15 (100)
Total	10 (33.33)	20 (66.66)	30 (100)

Note: Figures in parentheses indicate percentage to total

Summary

5. SUMMARY

The Kisan Credit Card scheme was introduced by NABARD in the financial year 1998-99 in order to overcome the difficulties of multi-credit and multi-agency approach. It is a landmark in the history of rural credit in India to provide hassle free credit with a validity of card upto five years with annual renewal. The scheme suits Kerala particularly, where multiple crops are grown and th resource poor farmers need credit for various purposes throughout the year. This study entitled "Performance analysis of Kisan Credit Card scheme in Thiruvananthapuram district" was carried out in order to understand the impact of KCC on the farming community with the objectives of analysing the progress and performance of KCC at macro and micro level and also to identify the constraints faced by beneficiaries.

The macro level study was conducted at all India level and for Kerala state. The data pertaining to the number of KCCs issued and amount sanctioned by banks was collected from various reports of banking institutions and also from Indiastat website for the period 2005-15. The micro level study was conducted in Parassala panchayat of Neyyattinkara taluk in Thiruvananthapuram district. From this panchayat one major commercial bank and co-operative bank serving the locality was selected. From these banks 15 beneficiaries and 15 non-beneficiaries were selected at random. Thus the total sample size was 60.

In order to know the progress of KCC at all India level and for Kerala, growth rates were estimated and the results showed that the number of cards issued at all India level had a growth rate of 13.74 per cent per annum which was lower than the growth rate of amount sanctioned (18.48 per cent per annum). But growth rate of amount sanctioned by the Commercial banks and Co-operative banks was 20.88 and 13.43 per cent per annum respectively during the period 2005-15.

The growth rate of the number of cards issued in Kerala was 3.03 per cent per annum whereas the CAGR of the co-operative banks was negative (-1.44 per

cent) indicating decline in the number of cards issued over the years. The amount sanctioned showed an increasing trend of 22.96 per cent which was very much higher than the growth rate of the number of cards issued.

The amount sanctioned per card by the banking sector showed a growth rate of 19.33 per cent and 4.16 per cent per annum for Kerala and India respectively which indicates a tendency of credit deepening in Kerala rather than credit widening.

Binary logit regression was carried out in order to know the socio economic variables influencing the respondents to join the scheme. Analysis showed that cropping pattern and education of the respondents were positively influencing the respondents.

The cost of cultivation for various crops was worked out in order to know the adequacy of credit to the beneficiaries of KCC and also to know whether there is variation in expenditure and income by utilization of KCC. The total cost of cultivation was worked using cost concepts. The total cost of cultivation of banana at the aggregate was ₹2,72,170 ha^{-1} and for the beneficiaries it was ₹2,78,787.88 ha^{-1} which was greater than the non-beneficiaries (₹2,64,384.16 ha^{-1}). Cost A$_1$ accounted for aggregate was ₹1,19,351.7 for the beneficiaries it was ₹1,22,442.42 ha^{-1} and ₹1,15,715.63 ha^{-1} for non-beneficiaries. Out of total Cost A$_1$ incurred majority was accounted by hired labour followed by manures and soil ameliorants for the aggregate, beneficiaries and non-beneficiaries.

The aggregate yield of banana was found to be 4613.09 kg ha^{-1} with a gross income of ₹2,99,851.4 ha^{-1}. The B:C ratio at Cost A$_1$, Cost A$_2$, Cost B and Cost C were found to be 2.51, 1.88, 1.14 and 1.10 respectively. The yield obtained by the beneficiaries was 4909.62 kg ha^{-1} with a gross returns of ₹3,19,125 ha^{-1}. The profitability was found using the B:C ratio for the beneficiaries it was found to be as 2.6, 2.01, 1.18 and 1.14 respectively at Cost A$_1$, Cost A$_2$, Cost B and Cost C. For non-beneficiaries the yield was found to be 4264.25 kg ha^{-1} with a gross

returns of ₹2,77,176.47 ha^{-1} and the B:C ratio at Cost A$_1$, Cost A$_2$, Cost B and Cost C were 2.39, 1.72, 1.07 and 1.04 respectively.

Cobb Douglas production was fitted and the resource use efficiency was calculated for all the crops. In banana all the variables under study were found positively influencing the yield but only manures and fertilizers was found significantly influencing the yield. The R^2 value of 0.77 explains that 77 per cent of the variation in the yield is due to the independent variables included in the model. The Σb_i value was found to be 1.36, means a simultaneous increase in all the independent variables by one per cent will increase the yield by 1.36 per cent which in turn is showing increasing returns to scale. The allocative efficiency was found to be greater than one for all the resources indicating under utilization of the resources.

When we consider aggregate cost of cultivation of tapioca it was found to be ₹1,81,259.60 ha^{-1}, for beneficiaries it was found to be ₹1,80,205.20 ha^{-1} and that of the non-beneficiaries was found to be ₹1,82,665.40 ha^{-1}. The Cost A$_1$ accounted at the aggregate level was found to be ₹74,591.32 ha^{-1} for the beneficiaries it was found to be ₹75,611 ha^{-1} and for non-beneficiaries it was found to be ₹73,231.21 ha^{-1}. Out of the total Cost A$_1$ a majority share was accounted by hired labour followed by manures and soil ameliorants, fertilizers and interest on working capital for beneficiaries, non-beneficiaries and at the aggregate level.

The yield of tapioca was found to be higher for beneficiaries (7583.75 kg ha^{-1}), followed by the aggregate level (7492.14 kg ha^{-1}) and the non-beneficiaries (7370 kg ha^{-1}). The gross returns received by the respondents also followed a similar pattern of beneficiaries (₹1,89,593.80 ha^{-1}), aggregate level (₹1,87,303.60 ha^{-1}) and non-beneficiaries (₹1,84,250 ha^{-1}). The profitability at aggregate level at different costs were found to be 2.51, 1.83,1.07 and 1.03 at Cost A$_1$, Cost A$_2$, Cost B and Cost C respectively.

The variables such as hired labour, plant protection chemicals and manures and fertilizers were positive and significantly influencing the yield at five and one per cent level of significance. The R^2 value of 0.68 explains that 68 per cent of the variation in the yield is due to the independent variables included in the model. The Σb_i value was found to be 1.06, means a simultaneous increase in all the independent variables by one per cent will increase the yield by 1.06 per cent which in turn is showing constant returns to scale.

The allocative efficiency was found to be less than one for manures and fertilizers and plant protection chemicals indicating the over utilization of resources. In case of hired labour and family labour allocative efficiency was found to be greater than one indicating sub optimal utilization of resources.

The cultivation of yard long bean showed that the major part of Cost A_1 was accounted by hired labour followed by pandal material and manures and fertilizers for the beneficiaries, non-beneficiaries and at the aggregate level. The Cost A_1 incurred at aggregate level was found to be ₹1,05,043.30 ha^{-1}, for beneficiaries (₹1,05,570.17 ha^{-1}) and for non-beneficiaries (₹1,04,187.14 ha^{-1}). The cost of cultivation was found to be higher for non-beneficiaries (₹2,29,291.70 ha^{-1}) followed by aggregate level (₹2,26,282.20 ha^{-1}) and beneficiaries (₹2,24,430.20 ha^{-1}).

The maximum yield was observed by beneficiaries (4491.61 kg ha^{-1}) with a gross returns of ₹2,47,038.50 ha^{-1} followed by aggregate level (4384.84 kg ha^{-1}) with a gross returns of ₹2,41,116.70 ha^{-1} and non-beneficiaries (4211.36 kg ha^{-1}) with a gross returns of ₹2,31,625 ha^{-1}.The B:C ratio was found to be higher for beneficiaries (2.34, 1.99, 1.13 and 1.10 at Cost A_1, Cost A_2, Cost B and Cost C respectively), followed by the aggregate level (2.29, 1.79, 1.10 and 1.06 at Cost A_1, Cost A_2, Cost B and Cost C respectively) and non-beneficiaries (2.22, 1.53, 1.04 and 1.01 at Cost A_1, Cost A_2, Cost B and Cost C respectively).

All the variables under study were found to be positively contributing to the yield but hired labour was found to be significantly contributing to the yield.

The R^2 value of 0.80 explains that 80 per cent of the variation in the yield is due to the independent variables included in the model. The Σb_i value was found to be 1.36, means a simultaneous increase in all the independent variables by one per cent will increase the yield will by 1.36 per cent which in turn is showing increasing returns to scale.

The allocative efficiency of the resources was worked out and found to be less than one for hired labour indicating over utilizations of resource. The other variables such as family labour, manures and fertilizers and plant protection chemicals were found to be greater than one indicting under utilization of resources.

The total cost of cultivation of cucumber was found to be higher for beneficiaries (₹2,35,311.50 ha^{-1}) followed by aggregate level (₹2,33,729.80 ha^{-1}) and non-beneficiaries (₹2,32,675.30 ha^{-1}). The Cost A_1 also followed a similar pattern as that of Cost C, indicating beneficiaries incurring higher cost of ₹1,05,220.20 ha^{-1} followed by aggregate level (₹99,139.22 ha^{-1}) and non-beneficiaries (₹95,058.21 ha^{-1}). Out of the total Cost A_1 a major share was accounted by hired labour, pandal material and manures and soil ameliorants for beneficiaries, non-beneficiaries and aggregate level.

The yield obtained by the beneficiaries was 5381.27 kg ha^{-1} with a gross returns of ₹2,42,157.50 ha^{-1} with the B:C ratio of 2.30, 1.73, 1.06 and 1.02 at Cost A_1, Cost A_2, Cost B and Cost C respectively. For non-beneficiaries the yield obtained was found to be 5377.41 kg ha^{-1} with a gross returns of ₹2,41,983.30 ha^{-1}. The B:C ratio was found be 2.54, 1.62, 1.07 and 1.04 at Cost A_1, Cost A_2, Cost B and Cost C respectively. The aggregate yield was found to be 5378.95 kg ha^{-1} with a gross income of ₹2,42,053 ha^{-1}. The B:C ratio was found to be 2.44, 1.67, 1.07 and 1.03 at Cost A_1, Cost A_2, Cost B and Cost C respectively.

The R^2 value of 0.76 explains that 76 per cent of the variation in the yield is due to the independent variables included in the model. . The Σb_i value was found to be 1.04, means a simultaneous increase in all the independent variables

by one per cent will increase the yield will by 1.04 per cent which in turn is showing constant returns to scale.

The allocative efficiency was found and the results showed the over utilization of resources in case of hired labour and plant protection chemicals indicating that the farmers should reduce the use of this resources in order to obtain a better yield. Manures and fertilizers and family labour were found to be greater than one indicating under utilization of resources. Hence farmers can increase the yield by increasing the use of these resources.

The total cost of cultivation of amaranthus for the beneficiaries was ₹2,26,311.07 ha^{-1} and Cost A_1 accounted for ₹1,07,216.90 ha^{-1}. In case of non-beneficiaries the total cost of cultivation was found to be ₹1,66,640.74 ha^{-1}, Cost A_1 was found to be ₹75,374.69 ha^{-1}. The aggregate cost of cultivation was found to be ₹2,20,930 ha^{-1}, Cost A_1 was found to be ₹1,03,309 ha^{-1}. The hired labour, manures and soil ameliorants and fertilizers had a major share of Cost A_1 in case of beneficiaries, non-beneficiaries and aggregate level.

The yield obtained by the beneficiaries was 9100.05 kg ha^{-1} and a gross returns of ₹2,27,501.25 ha^{-1}. The B:C ratio was found to be 2.12, 1.65, 1.03 and 1.01 at Cost A_1, Cost A_2, Cost B and Cost C respectively. For non-beneficiaries the yield obtained was found to be 7555.55 kg ha^{-1} with a gross returns of ₹1,69,999.87 ha^{-1}. The B:C ratio at Cost A_1, Cost A_2, Cost B and Cost C were 2.25, 1.84, 1.07 and 1.02 respectively. The aggregate yield was found to be 9083.33 kg ha^{-1} with a gross income of ₹2,27,083.25 ha^{-1}. The B:C ratio at Cost A_1, Cost A_2, Cost B and Cost C were 2.19, 1.74, 1.06 and 1.02 respectively.

The cost of production of the respondents was worked out, using the Cost A_1 (₹ ha^{-1}) and the yield obtained (kg ha^{-1}) by the respondents in order to know the cost incurred by them to produce one kilogram of the produce. It was evident that in case of banana the cost of production was found to be higher among non-beneficiaries (₹27.13 kg^{-1}) followed by the aggregate (₹25.87 kg^{-1}) and beneficiaries (₹24.93 kg^{-1}). For tapioca the cost incurred was found to be almost

similar for beneficiaries, non-beneficiaries and aggregate. For yard long bean the cost of production was found to be higher among non-beneficiaries (₹24.74 kg⁻¹) followed by the aggregate (₹23.95 kg⁻¹) and beneficiaries (₹23.50 kg⁻¹). In case of cucumber, beneficiaries incurred a higher cost (₹19.55 kg⁻¹) followed by aggregate (₹18.43 kg⁻¹) and non-beneficiaries (₹17.68 kg⁻¹). The beneficiaries incurred a cost of ₹11.78 kg⁻¹ followed by the aggregate (₹11.37 kg⁻¹) and non-beneficiaries (₹9.97 kg⁻¹) in the cultivation of amaranthus.

The year of joining the scheme was considered to be the one of the most important factor related to the performance of KCC and also to know the acceptance of the scheme by the farmers. The results showed that 50 per cent of respondents joined the scheme during 2009-13 followed by 40 per cent during 2006-09 and only 10 per cent joined after 2013. Around 50 per cent of respondents obtained information about the scheme from Krishi Bhavan followed by 33.33 per cent from banks as a source and 13.33 per cent from Horticrop. The result showed that the average amount applied for loan was ₹60,666 and in case of beneficiaries of SBI and co-operative banks it was found to be ₹69,333 and ₹52,000 respectively depicting higher amount sanctioned for the beneficiaries of SBI, whereas in case of repayment beneficiaries of Co-operatives were better than beneficiaries of SBI. The average number of renewal was found to be 5.73 times. Under KCC the credit limit was set as ₹1 lakh for short term loans which is also called as crop loans, an amount of ₹3 lakh as limit for medium term loans and ₹5 lakh as limit for long term loans. The maximum amount of loan for the sample was found to be 1 lakh rupees as the beneficiaries were hesitant to provide land as security for higher amount. In the case of withdrawal of the sanctioned credit the farmers withdraw in lumpsum eventhough there is scope for multiple withdrawals within the limit. It was evident that 53.33 per cent of the beneficiaries had completely repaid the loan amount whereas 46.66 per cent beneficiaries made only partial repayment of the amount. In the opinion of the respondents availing loan under KCC, it was not that cumbersome as compared to the other loan procedures.

In case of beneficiaries the total amount sanctioned under different loans was found to be ₹9,67,946.93, out of which 74.11 per cent was accounted by housing loans followed by 12.53 per cent under crop loan/KCC loan, agri-gold loan and vehicle loan accounted for 7.74 and 5.62 per cent respectively. In case of non-beneficiaries the total amount sanctioned under different loans was found to be ₹8,77,916.66. A similar trend was followed in non-beneficiaries with housing loan accounting for 58.66 per cent followed by general agricultural credit (15.37 per cent), agri-gold loan and consumption loan accounting for 6.64 per cent, vehicle loan (6.43 per cent) and general gold loan (6.26 per cent).

Scale of finance was compared at Cost A_2 and Cost C for the various crops and adequacy was worked out. In order to workout the adequacy of credit first we should consider the cost of cultivation of different crops at Cost A_2 and Cost C, then we have to deduct the scale of finance given by the district level bankers committee for that particular area. If the result obtained is negative then it indicates adequacy of credit and if positive shows inadequacy of credit. At Cost A_2 the credit was found to be adequate for all the crops. At Cost C credit was found to be adequate for all the crops grown by respondents except for tapioca. The total cost of credit was found to be higher for beneficiaries of Co-operative bank (7.4 per cent) compared to beneficiaries of SBI (7.2 per cent). Ordinary least square estimates was performed in order to know the factors influencing the credit requirement of the respondents. The analysis showed that cost of cultivation and loan for non-farming operations were found to be influencing the credit requirement of the respondents positively. It implies that as the cost of cultivation increases the tendency of farmers to obtain more credit and the non-farm loan are indicative of more consumption credit by the respondents.

The major constraints as perceived by the beneficiaries were with respect to procedural formalities which include time delay and formalities for obtaining the land records from village office and multiple visits to the bank for the sanction. Moreover the credit limit under the scheme was not considering the consumption needs and also respondents found difficulty in annual renewal of the

KCC account. In the opinion of respondents, the consumption needs are more prominent than production credit and if family size is considered as criteria for fixing consumption credit limit the KCC scheme would be more attractive.

5.1 SUGGESTONS

- The linking of KCC with storage and warehousing facility and marketing agencies would avoid indebtedness of farming community.

- Multiple financing should be avoided to solve the problem of diversion of credit and proper repayment.

- The consumption credit should be merged with the production credit upto certain extent such that the farmers needs are met under a single credit.

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Appendix I

APPENDIX – I

Kerala Agricultural University

College of Agriculture, Vellayani

Department of Agricultural Economics

Performance analysis of Kisan Credit Card scheme in Thiruvananthapuram

district

Survey Schedule

I.   Details of the farmer :

a) Name of the farmer :

b) Address :

c) Village :   d) Panchayat :   e) Block :

f) Age and education :   g) Phone number :

h) Family details :

Sl No.	Relation with head	Sex	Age in years	Education	Occupation		Income	
					Main	Subsidiary	Main (₹)	Subsidiary (₹)
1								
2								
3								
4								
5								

Relation with Head: 1. Head, 2. Wife, 3. Son, 4. Daughter, 5. Son in law, 6. Daughter in law, 7. Sister, 8. Brother, 9. Grandson , 10. Granddaughter, 11. Others (specify)

Sex: 1. Male 2. Female

Education: 1. No schooling, 2. Primary school, 3. Upper primary, 4. High school (up to tenth), 5. Higher secondary, 6. Graduate, 7. Post graduate, 8. Others (specify)

Occupation: 1. Agriculture only, 2. Govt. Employee, 3. Private employee, 4. Own business, 5. Agricultural labourer, 6. Non Agricultural labourer, 7. Not working, 8. House wife, 9. Student

  a) Wet land (cents) :

  b) Garden land (cents) :

  II. Details on land holding :

Sl. no.	Type of land holding	Own land (cents)	Leased land (cents)	Land revenue (₹)
1.	Wet land			
	a) Cultivated land			
	b) Fallow land			
2.	Garden land			
	1) Rainfed			
	a) Cultivated			
	b) Fallow			
	2) Irrigated			
	a) Cultivated			
	b) Fallow			

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III. Cropping pattern :

Sl. no.	Crops	Area under cultivation (cents)	No. of plants	Quantity produced (in kg)	Price of the product (₹ / kg)	Crop expenditure (₹)	Net income (₹)
1							
2							
3							
4							
5							

IV. Implements :

Sl. No.	Particulars	Number	Year of purchase	Value (₹)	Expected life (Years)	Depreciation (₹)
1	Plough					
2	Pickaxe					
3	Spades					
4	Sprayers					
5	Vaakathi/ Knife					
6	Ladder					

V.   **Value of assets :**

Sl. No	Assets	Number	Value (₹)	Year of purchase	Present value (₹)	Depreciation (₹)	Maintenance cost (₹)
1.	Land value						
2.	Own house						
3.	Vehicles						
	a) Car						
	b) Bike						
4.	Farm implements						
5.	Furniture's						
6.	Electrical goods						
	a) Mobile						
	b) TV						

VI.   **Family expenditure pattern :**

Sl. No.	Purpose	Expenditure (₹ /month)
1	Food expenditure	
2	Education expenses	
3	Medical expenses	
4	Recreation	
5	Transportation	
6	Clothing	

VII.   **Details of livestock :**

Sl. no.	Type of animal or bird	Number	Annual income (₹)	Expenditure (₹)	Net income (₹)
1					
2					
3					
4					
5					

VIII.   **KCC scheme / Non-KCC scheme :**

1) Whether KCC beneficiary or not :   a) Yes   b) No

2) Year of joining KCC scheme:

3) Year of availing agricultural credit :

4) Name of bank offering KCC to you :

5) The source of information about the scheme :

    a) Relatives   b) Friends

    c) From the bank   d) Fellow farmers

    e) Krishi Bhavan   f) others (specify)

6) Purpose of joining the scheme ?

    a) Expansion of agricultural operation   b) Lack of fund

    c) Milching of animals/ rearing birds

    d) Acquisition and maintenance of assets   e) Others (specify)

7) Motivation for joining the scheme :

    a) Friends or relatives working in the branch

    b) Quality conditions of bank

    c) Previous relations with the bank

    d) Approach of the bank officers towards the borrowers

    e) Others (specify)

8) Amount of loan applied for :

9) Credit limit sanctioned :

Sl. no	Purpose of availing loan	Short term loan (₹)	Medium term loan (₹)	Long term loan (₹)
1				
2				
3				
4				

10) Rate of interest :

Sl. no	Type of loan	Rate of interest
1	Short term loan	
2	Medium term loan	
3	Long term loan	
4	Others : 1) 2) 3) 4)	

11) What are the procedures for taking Kisan credit cards?

12) Time taken for completing the procedure ?

    a) One week   b) Two weeks   c) One month   d) > a month

13) Are there any difficulties in taking KCC ?   a) Yes   b) No

14) How many times did you renew the card ?

15) Date of renewal of KCC :

16) What were the renewal procedure in bank ?

17) Transaction cost for KCC / non KCC holders :

Sl. no.	Purpose	Amount (₹)
1	Legal charges	
2	Travel cost	
3	Time spent (in hrs or days)	
4	Processing cost/ service charges	
5	Documentation cost	

18) Amount withdrawn :

19) Mode of withdrawal :

    a) Lumpsum   b) Installments

20) Amount repaid :

    a) Completely repaid   b) Partially repaid   c) No repayment

21) Mode of repayment :

    a) Lumpsum   b) Instalments

22) What is the frequency of repayment scheme proposed ?

a) Monthly   b) Quarterly   c) half yearly

d) Yearly   e) On the basis of crop duration

23) Source of repayment

    a) From the earnings for which loan was taken

    b) From loan taken for other purpose

    c) Money lenders   d) Friends/relatives

24) Whether the borrower is able to repay the loan for the purpose for which it was taken?

    a) Yes   b) No

25) Whether the entire amount of credit was repaid last year ?

    a) Yes   b) No

26) Details on overdue and repayment of KCC holders :

Sl. no.	Type of loan taken	Amount overdue (₹)	Amount repaid (₹)
1			
2			

27) Utilization of the scheme

Sl. No.	Activities	Amount (₹)	ST / MT			LT		
			Utilized (₹)	Partially utilized (₹)	Not utilized (₹)	Utilized (₹)	Partially utilized (₹)	Not utilized (₹)
1								
2								
3								

28) Loan details of Non – KCC holders :

Sl. No.	Type of loan	Purpose of loan	Amount sanctioned (₹)	Utilization of loan amount (₹)	Amount repaid (₹)	Amount overdue (₹)	Rate of interest
1							
2							
3							

IX.   Input costs :

Sl. No.	Input used	Quantity applied		₹ / unit	Total expenses (₹)
		Unit	Quantity		
1	Seeds				
2	Fertilizer Application 　1.　Urea 　2.　DAP 　3.　MOP 　4.　Complex 　5.　Others				
3	Manures 　1.　Cow dung 　2.　Green Manure 　3.　Sheep Manure 　4.　Poultry Manure				
4	Soil ameliorants 　1.　Lime 　2.　Others				
5	Weedicides 　1. 　2. 　3.				
6	Pesticides 　1. 　2. 　3.				
7	Fungicides 　1. 　2. 　3.				
8	Total				

X.   Labour cost

Wage rate: Men (₹/day) _____   Women (₹/day) _____

Machinery rent (₹/hour) _____   Total cost (₹) _____

Sl. No.	Particulars		Family labour (man days)		Hired labour (man days)		Machine Labour (hours)
			Men	Women	Men	Women	
1	Digging pits						
2	Organic manure						
3	Fertilizers						
4	Liming materials						
5	Plant protection operations	Bio control					
		Chemical					
6	Weeding						
7	Irrigation						
8	Intercultural operations						
9	Harvesting						
10	Post harvest operations						
11	Transport						

XI. CONSRAINTS :

1) About rate of interest :

   a) Very high   b) High   c) Moderate   d) Low   e) Very low

2) About the repayment schedule:

   a) Very high   b) High   c) Moderate   d) Low   e) Very low

3) Duration of loan :

   a) Very high   b) High   c) Moderate   d) Low   e) Very low

4) Procedural formalities :

   a) Very high   b) High   c) Moderate   d) Low   e) Very low

5) Present credit limit : a) Adequate   b) Inadequate

6) Behaviour of employees in the bank :

   a) Very good   b) Good   c) Not good

7) About the scheme : a) Very good   b) Good   c) Not good

8) Renewal procedure : a) Very good   b) Good   c) Not good

9) Timeliness of credit : a) Timely available   b) Not timely available

10) Viability of scheme : a) Viable   b)   Not viable

11) Improvement of agricultural development with the scheme :

   a) Yes   b) No

12) Suggestions about KCC scheme :

   a) Credit limit to be increased considering family expenses

   b) Extent of validity of card up to 5 years

   c) Lower the interest rate

Appendix II

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APPENDIX – II

Number of KCC issued and amount sanctioned at all India level from 2005 to 2015

Year	Commercial banks		Co-operative banks		Total banking sector	
	Number	Amount sanctioned	Number	Amount sanctioned	Number	Amount sanctioned
2005	20612128	1877900	27190922	2033900	47803050	3911800
2006	5414025	1877947	2598226	2033937	8012251	3911884
2007	34284249	8828261	33260689	11522427	67544938	20350688
2008	4605775	5953000	7539065	3888964.79	12144840	9841964.79
2009	7248628	3900873	1343845	842800	8592473	4743673
2010	7262870	3994026	1743253	760633	9006123	4754659
2011	7356727	5043780	2811850	1071896	10168577	6115676
2012	8798616	6951767	2959043	1064252	11757659	8016019
2013	73988577	35314482	46349201	17387700	120337778	52702182
2014	65328720	33371468	35765467	16195288	101094187	49566756
2015	34867186	4739066	39226904	7740470.57	74094090	12479536.57

Note : Amount sanctioned in lakh rupees.

Appendix III

APPENDIX – III

Number of KCC issued and amount sanctioned at Kerala state level from 2005 to 2015

Year	Commercial banks		Co-operative banks		Total banking sector	
	Number	Amount sanctioned	Number	Amount sanctioned	Number	Amount sanctioned
2005	190781	59747.25	162210	44859.32	352991	104606.57
2006	168352	89433.2	185816	53157.83	354168	142591.03
2007	172901	84075.55	172720	67474	345621	151549.55
2008	183631	116886.47	146042	41975.02	329673	158861.49
2009	173694	103511.98	90199	58336.68	263893	161848.66
2010	124568	114623.38	177717	97449.83	302285	212073.21
2011	195527	263064.14	174309	111795.13	369836	374859.27
2012	246525	381398.26	137662	743052	384187	1124450.26
2013	272152	380426.34	112223	79859	384375	460285.34
2014	271150	408976.66	135932	78476.83	407082	487453.49
2015	327299	615038.1	175864	117625.92	503163	732664.02

Note : Amount sanctioned in lakh rupees.

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Abstract

PERFORMANCE ANALYSIS OF KISAN CREDIT CARD SCHEME IN THIRUVANANTHAPURAM DISTRICT

by

KSHAMA, A. V.
(2016-11-100)

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DEPARTMENT OF AGRICULTURAL ECONOMICS
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ABSTRACT

The research entitled 'Performance analysis of Kisan Credit Card in Thiruvananathapuram district' was conducted with the objectives of examining the progress and performance of Kisan Credit Card at macro and micro level and to identify the constraints faced by beneficiaries. The secondary data were collected regarding the number of cards issued and the amount sanctioned at all India level and at Kerala state level from various government institutions and banking publications for a period of 10 years. Primary data were collected from Parassala panchayat of Neyyattinkara taluk. The information was collected from 30 KCC beneficiaries and 30 non-beneficiaries randomly selected from the major commercial and co-operative banks of the locality. Thus the total sample size was 60.

For the number of cards issued, Kerala recorded a lower compound annual growth rate (CAGR) than all India which was 3.03 and 13.74 per cent per annum respectively. Whereas for the amount sanctioned the performance of Kerala state was better (22 per cent per annum) compared to all India (18 per cent per annum). The amount sanctioned per card by the banking sector showed a growth rate at of 19 per cent and 4 per cent per annum for Kerala and India respectively which could indicate a tendency of credit deepening in Kerala rather than credit widening.

Binary logit regression was done to know the socio economic variables influencing the respondents of the scheme. Analysis showed that cropping pattern and eductaion of the respondents were found to have positive influence.

The total cost of cultivation was estimated using cost concepts, considering both fixed and variable costs. The most profitable crop was banana, followed by yard long bean, cucumber, tapioca and amaranthus and the B:C ratios were 1.10, 1.06, 1.03, 1.03 and 1.02 respectively at Cost C. From the results of regression analysis it was evident that the coefficient of determination had values

ranging from 0.68-0.80 indicating 68-80 per cent of the variation in the gross returns was due to the independent variables under consideration.

It was found that 50 per cent of the respondents joined the scheme during 2009-13 and 40 per cent joined during 2006-09. About 50 per cent of respondents obtained information from Krishi Bhavan followed by 33 per cent from banks as a source and 13 per cent from Horticorp. The average amount applied for the loan was ₹60,666 and it was more in case of beneficiaries of SBI (₹69,333) than co-operative bank (₹52,000). The average number of renewal of the accounts was found to be 5.73 times. While considering repayment, 73 and 86 per cent of the beneficiaries of SBI and Co-operatives respectively were able to repay the loan amount completely. The average amount of loan sanctioned was more for beneficiaries of SBI but the repayment was better for the loanees of co-operative bank.

Scale of finance was compared with Cost A_2 and Cost C for the various crops. Invariably for all crops the credit was adequate while considering paid out costs (Cost A_2). At Cost C, credit was found adequate for all crops except tapioca. The total cost of credit was found to be higher for beneficiaries of Co-operative bank (7.4 per cent) compared to beneficiaries of SBI (7.2 per cent). It was evident from the ordinary least square estimates that cost of cultivation and loan requirement for non-farming operations were influencing the credit requirement of the respondents positively.

The major constraints as perceived by the beneficiaries were with respect to procedural formalities which include time delay and formalities for obtaining the land records from village office and multiple visits to the bank for the sanction. Moreover the credit limit under the scheme was not considering the consumption needs and also respondents found difficulty in annual renewal of the KCC account.

The amount per card issued in Kerala state was low when compared to all India level eventhough the growth rate was more which warrants for expansion of

credit for agricultural development. The beneficiaries of KCC were able to purchase better quantity and quality of inputs thereby leading to higher profitability from various crops. Some inputs were found to be over utilized, which shows that the respondents can increase their income by rational use of inputs. In the opinion of respondents, the consumption needs are more prominent than production credit and if family size is considered as criteria for fixing consumption credit limit the KCC scheme would be more attractive. The linking of KCC with storage and warehousing facility and marketing agencies would avoid indebtedness of farming community.