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IMPACT OF CO-OPERATIVE LOAN ON SMALL AND MARGINAL FARMERS OF E.G.DISTRICT OF ANDHRA PRADESH

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ABSTRACT

Agriculture forms the backbone of the Indian economy. It contributes 18.5 percent to the GDP and provides employment to about 52 percent of the total working population during the year 2006-07. The advanced technological changes in the agricultural sector necessitated the requirement of more working capital. Hence, the poor peasants in India are in search of timely credit. Co-operative banks were established on the principle of co-operation and to serve the poor peasants. The main function of these banks is to relieve the poor farmers from the clutches of money lenders. These are playing significant role in extending credit to the farm sector besides providing inputs, marketing and extension services. Particularly in the state of Andhra Pradesh (A.P.), Co-operatives play a very important and crucial role in the growth and development of agricultural sector. East Godavari District is an agriculturally developed district in Andhra Pradesh where paddy forms up to 53 percent of the total cultivated area. In the district, Co-operatives are functioning in most efficient manner by providing adequate, cheap and timely credit to agriculture and allied sector. They spread to the remote areas of the district in order to serve the needy farmers. These Banks accept deposits and lend both short-term and long-term credit for production and investment purpose through Primary Agricultural Co-operative Societies (PACS) and also directly to the farmers. Co-operative Banks are the friendly banks developed to relieve the poor from the vicious circle of poverty. These are providing timely and adequate credit to the three sectors viz., primary, secondary and tertiary, particularly to agriculture and allied sector at cheaper rates. On this backdrop, an attempt is made to analyze the impact of cooperative loans on the agricultural development of the state, Andhra Pradesh. In order to study the impact, East Godavari district is to be chosen as sample as it represents the overall characteristics of Andhra Pradesh.

KEYWORDS

cooperative credit, District Central Cooperative Bank (DCCB), Primary Agricultural Cooperative Societies (PACS), irrigation, yield, crop and term-loans, High yield varieties (HYV), allied sector, livelihood

1. INTRODUCTION

Co-operative Movement in India was started primarily for dealing with the problem of rural credit. Indian agriculture is mainly dominated by small, marginal farmers and landless labourers who live in the subsistence economy and are not in a position to finance agricultural inputs for the development of agriculture. So to meet their agricultural requirements, adequate credit is crucial for the agricultural development. Agriculture requires appropriate institutional mechanism to purvey both short-term and long-term credit to the farmers. After the Independence, the Government of India (GOI) has adopted a multi-agency approach for farm credit in order to provide adequate, cheap and timely credit.

Cooperatives have occupied an important place in agricultural development of the country as they provide basic credit which lubricates the wheel of agriculture. The District Central Co-operative Bank (DCCB) occupies and forms an important position in the Co-operative credit structure. The success of the Co-operative credit movement largely depends upon the role and financial strength of the DCCB. The finance granted by the DCCB is given to the cultivators through PACS. Hence the Co-operative banking structure has been conceptualized to play vital role in providing timely, adequate and cheaper credit to the farmers for basic support to core agricultural activities.

Credit Co-operatives play an important role in the Indian financial system especially at the village level. These are one of the important components of multi-agency system which plays a vital role in the development of the nation. These are the oldest and the most numerous of the all types of Co-operatives in India. The origin of Indian Co-operative Banking started with the enactment of Co-operative Societies Act, 1904. The objective of this Act was to establish Agricultural Co-operative Credit Societies "to encourage, thrift, self-help and co-operation among agriculturists, artisans and persons of limited means".

The following are the objectives of Credit co-operatives:

- i) To ensure timely and increased flow of credit to the farming sector
- ii) To reduce and gradually eliminate the money lenders
- iii) To reduce regional disparities throughout the country
- iv) To provide longer credit support to various rural development programmes
- v) To provide cheap credit with or without any security.

Co-operative Banks are organized and managed on the principle of co-operation, self-help and mutual-help and function with the rule of "one member, one vote", function on "no profit, no loss" basis. Co-operation as principle does not pursue the goal of profit maximization.

Andhra Pradesh is basically an agrarian economy and is known as "Granary of the South" by producing one-tenth of India's total output of food grains. As Andhra Pradesh is predominantly agricultural in character around 70 percent of the population depends on it for their livelihood. In Andhra Pradesh the Co-operative credit societies play an important role in serving the needy farmers by providing short term, medium term and long term loans at lower rates of interest. Andhra Pradesh is the first state which implemented the Single Window Credit Delivery System (SWCDS) in 1987. It is an innovative programme in which PACS are expected to provide multi-farm credit and multi-functional services at a single contact point.

East Godavari is one of the north-eastern districts of Andhra Pradesh. It shares the distinctions of "Rice Bowl of Andhra Pradesh" by producing paddy of 2625 kg per acre. As it is situated on the coastal side of Andhra Pradesh, majority of the East Godavari district people depend on agriculture and allied sectors for their livelihood. It is one of the highest population density regions, as agriculture is well developed. Rice, tobacco, pulses and coconut etc. are the major crops of this district.

The net area cultivated with crops forms about 41 percent of the total geographical area of the district. Out of the net area sown a large portion of the area is irrigated by the network of irrigation canals in the district. The Godavari Irrigation System (GIS) irrigates all the mandals in delta region. Paddy forms 53 percent of the total area sown with an average yield of 2625 kgs. / Acre in the district. The district stands first in the cultivation of the coconut and bananas. Out of the total production of bananas and coconuts in the state 36 percent and 57 percent of the production is from this district only.

In this district Co-operatives are functioning in most efficient manner by providing adequate, cheap and timely credit to the agriculture and allied sector. Co-operative Credit institutions at district level are serving the agriculture and allied sector to a great extent in the East Godavari District. They spread to the remote areas of the district in order to serve the needy farmers. The Government of Andhra Pradesh set up Co-operative Central Bank at district level in Kakinada in the year 1987. The East Godavari District Cooperative Central Bank Ltd., Kakinada (DCCB) is one of the biggest Cooperative Central Banks in Andhra Pradesh catering the needs of the agriculturists. It performs all the banking functions as per the Banking Regulation Act 1949. Now the bank is rendering services with 47 branches and 293 Primary Agricultural Co-operative Societies in the district.

It was established as a result of Single Window Credit Delivery System (SWCDS), by the amalgamation of four DCCBs viz., The Kakinada Co-operative Central Bank, The Ramachandrapuram Cooperative Central Bank, The Konaseema Co-operative Central Bank and The Rajahmundry Co-operative Central Bank. Actually it had operations from the year 1917 itself. It performs all the banking functions as per the Banking Regulation Act 1949. The bank accepts deposits and lends both short-term and long-term credit for production and investment purpose through Primary Agricultural Co-operative Societies and also directly to the farmers. As on 31st March 2010 there were 47 branches including head office, 1534 Primary Agricultural Co-operative Societies with a membership of 47,532. These institutions mobilized deposits of Rs. 23, 131 Crores and issued short-term loans of Rs. 24, 567 lakhs and non-agricultural loans of Rs. 4545 lakhs. It earned a profit of Rs.124 lakhs for the year 2009-10.

2. REVIEW OF LITERATURE

Agricultural finance as a strategic input in farm production and credit as a tool in productivity has attracted considerable attention of the researchers. Cooperative credit for agriculture and allied activities occupied a predominant position in the Cooperative movement to fulfill the economic needs of nearly 80 percent of the population living in villages.

The findings of earlier studies might possibly give indications of the problem on the one hand and also provided certain guidelines for the present study. In addition, the earlier studies provided the necessary cushion for a proper understanding of the role of Cooperative credit and its role in helping farmers so that pointed attention was focused which in turn would enable the policy makers to plan appropriate strategy and apply corrective measures wherever necessary.

As agriculture forms the backbone of the Indian economy, The Government of India recognized the importance of free flow of credit to agriculture and allied sectors. Sharma (1967) stated that for agricultural development, credit is an important input which ensures adequate working capital as well as infrastructural development. Deccan Ryots Commission (1875) and Famine Commission (1880) concluded in their reports that majority of land holdings were deeply and inextricably in debt. The Central Banking Enquiry Committee (1929) observed that institutional credit provided to the agriculturists covered only a smaller portion. Black (1955) has emphasized the importance of credit and observed that credit provision was the first and foremost input to be increased, which enabled the farmers to buy more labour saving equipment, better seeds and fertilizers etc. Ford Foundation (1959) had recommended adequate supply of farm credit in order to increase the farm productivity. Mishra (1982) has observed that modernization of agriculture necessitated huge capital investment. Hence, farm credit becomes *sine qua none* of agricultural development in the country. Reports of Frederic Nicholson and Edward Law Committee on Co-operative legislation confirmed and reiterated the need for the state to actively promote co-operatives. A decade later, a MacLagan Committee (1915) advocated that "there should be one Cooperative for every village and every village should be covered by a Co-operative". In 1928, Royal commission observed that "if co-operation fails, there will fail the best hope of rural India".

Calvert (1996) aptly argued that cooperative credit is the practical alternative to usury. Adequate credit increases the agricultural output. The observations of Chaudhuri (2001) were strongly supported by Shetty (2004) and suggested that in order to increase the productivity of agriculture, better institutional credit delivery mechanisms were to be conceptualized, planned and executed urgently. As agriculture forms the backbone of the Indian economy, The Government of India recognized the importance of free flow of credit to agriculture and allied sectors. Sharma (1967) stated that for agricultural development, credit is an important input which ensures adequate working capital as well as infrastructural development. Adequate credit increases the agricultural output. Agricultural credit and agricultural development goes by hand in hand, hence the farmer should be provided adequate and cheap credit (Dutta and Sundaram, 2005). It is supported by Kanthimathinadhan (2005) and suggested that without cheap credit is not possible for small and marginal farmers to survive. Shetty (2004) and Shivaloganathan suggested in their work that better institutional credit facilities is highly essential for agricultural growth. He also suggested multi-agency approach in order to fill gap between supply and need of credit in agricultural sector. Pathania (1987) analyzed the utilization of co-operative credit in agricultural sector and concluded that with the proper utilization of Co-operative credit the farmers can increase their productivity. It was strongly supported by Sharma (1989), Modi and Rai (1993), Sathey (1996) and Patnaik (1999). B.Subrahmanyam (2005) viewed that Co-operative rural credit delivery system has been farmer-friendly and has out reached to serve agriculture. Calvert (1996) aptly argued that Cooperative credit is the practical alternative to usury. Subbaiah & Selvakumar (2005) observed that the institutional finance to agriculture which has contributed 22.1 percent of GDP in 2002-03. He also found that the govt. has estimated the credit flow from all lending institutions for the year 20003-04 at Rs. 80000 crores and has planned to enhance the level of flow to Rs. 105000 crores for the year 2004-05 which represents an increase of 30 percent over the previous year. Vilasrao Deshmukh (2005) said that the Co-operatives in India account for more than half of industrial finance advanced to agriculture and one-fifth of private capital formation. Sri Rajnath Singh (2006) called upon the Govt. to take necessary steps so that farmers may not have to pay more than 6 percent interest on the agricultural loans.

3. METHODOLOGY

The objective of the present study is to analyze the impact of cooperative loans on agriculture sector, primarily on small and marginal farmers of East Godavari district in Andhra Pradesh. The present study is an attempt to analyze the impact of cooperative credit on the beneficiaries of the district. Its' focus is regional and pertains to E.G. District only. In view of this, an attempt has been made to study the role of the DCCB, Kakinada and Primary Agricultural Co-operative Societies working under it for the growth and development of agricultural sector in the E.G. District of Andhra Pradesh. Agricultural development in the present work has been assessed through the flow of cooperative credit to farm sector. In order to study the impact of cooperative credit, the credit supplied by the DCCB Kakinada through PACS to different sections of the agricultural sector has been analyzed. The credit supplied by the cooperative banks to different sectors such as short-term credit, long-term credit and credit to agricultural sector has also been analyzed. The growth in the usage of agricultural inputs is also analyzed to study the objective. The study is based on two sets of data viz., Primary and Secondary. The primary data relating to socio-economic background, credit structure, incomes, use of fertilizers and HYV seeds, yield per acre, employment generation, and land infrastructure etc. are collected from 432 sample beneficiaries of E.G. District by direct personal interview method. The sample beneficiaries were selected by stratified random sampling method. The secondary data relating to the growth and development of cooperative banks in the district was collected from the various publications & websites of the Directorate of Economics and Statistics. Data relating to DCCB, Kakinada was obtained from the annual reports & websites of DCCB, Kakinada.

The collected data was suitably classified and tabulated for the purpose of analysis and interpretation with simple statistical tools of analysis like ratios, percentages, etc. To test the hypotheses, Paired't' test etc. was used. To assess the impact of Co-operative credit on the beneficiaries of agricultural sector, the data relating to pre-loan and post-loan period was collected.

One of the major limitations of the study is that it has been confined to E.G. District only, which is rather not a representative unit for realistic data acquisition and virtual comparisons of the performance of various similar DCCBs. Only paddy cultivation has been taken for the present study as paddy cultivation is the main staple of agriculture in E.G. District. While collecting the primary data recall method was employed. As the sample respondents have no habit of maintaining records of their operations especially income, output etc., there may be chances of errors in the data collected.

4. ANALYSIS

The Green Revolution results in remarkable changes in agricultural sector. The Revolution initiated through the changes in the approach of the Fourth Five Year Plan envisaged that modernizing agriculture is more or less a technology of inputs and its judicious management on scientific basis. This new situation calls for greater financial investment on the part of farmers for purchasing of the inputs. Consequently the provision of credit to farmers on liberal terms and conditions become *sine qua none* of agricultural development in the country. The development of Co-operative credit in the form of catalyst has accelerated the pace of agricultural development.

The Government of Andhra Pradesh (GoAP) set up Co-operative Central Bank at district level in Kakinada in 1987. As Kakinada is the district headquarters and surrounded by so many villages, it is suitable for establishing Co-operative Central Bank. The E.G. District Cooperative Central Bank Ltd., Kakinada (DCCB) is one of the biggest Cooperative Central Banks in Andhra Pradesh catering the needs of the Agriculturists in East Godavari District. The DCCB is deemed to have been

registered as Cooperative Society under Section 7 of Andhra Pradesh Cooperative Societies Act, 1964. It started its operations 88 years ago (i.e., from 22.01.1917). The jurisdiction of the Bank extends to the entire East Godavari District and is servicing the rural clientele through 47 Branches in the District. Among other districts in Andhra Pradesh, the E.G. District leads in agricultural productivity. As it is situated on the coastal line of Andhra Pradesh, the main occupation of people is agriculture. Though this district is full of natural resources, agriculturists lack adequate funds to reap the fruits of the nature. E.G. District is having fertile lands with high irrigation facilities, but with small holdings and landless labourers. In order to serve poor and rural peasants, Cooperative Central Banks were established in this district.

In this district, Co-operatives are functioning in most efficient manner by providing adequate, cheap and timely credit to agriculture and allied sector. The District Central Co-operative Bank, Kakinada being a farmer's bank in the district covered all 1327 villages and 54 Revenue Mandals by its wide network of 47 branches and 310 Primary agricultural Cooperative Societies providing services from the last 88 years. The District Central Co-operative Banks are playing very crucial role in serving the rural peasants of the district.

In order to study the impact of co-operative credit on small and marginal farmers, the entire district was grouped into three stratus depending upon the factor of irrigation viz., Irrigated (V₁), Semi-irrigated (V₂) and Non-irrigated (V₃) pockets. The impact of Co-operative credit was analyzed by the modernization of agricultural process during the pre-loan and post-loan periods.

To know the impact of agricultural credit on borrowers, the study is divided into two categories viz., (i) Impact on Agricultural Crop loan (ii) Impact on Agricultural Term loan. Benefits derived by agricultural crop loans and term loans are analyzed on the basis of the following parameters:

- a) Impact on irrigation
- b) Impact on cropping pattern
- c) Impact on use of fertilizers, pesticides and manures etc.
- d) Impact on labour cost
- e) Impact on Production and yield per acre
- f) Impact on income per borrower and income per acre of holding.

To know the impact on Agricultural crop and term loans again, the borrowers are classified on the basis of caste and operational holdings.

4.1 IMPACT ON AGRICULTURAL CROP LOAN

The short-term loans are disbursed in the form of 'A' and 'B' components, such that 'A' comprises cash portion to meet the costs of agricultural operations and 'B' comprises kind portion to meet the costs of seed, fertilizer, pesticides etc., supplied to members through the co-operative deposits. The interest for crop loan is about 11 percent till 2007-08. But now the interest rate is going to decrease to a rate of 4 percent from this year onwards. The short-term loans are sanctioned for all crops including local, improved and HYV as per the scale of finance. These loans help the cultivators to meet the working capital needs and to generate surplus for agricultural development.

The farmers are classified into three groups basing on the size of land holdings-small (below 2.5 acres), medium (2.5-5 acres) and large farmers (above 5 acres).

TABLE 1: DISTRIBUTION OF SAMPLE BENEFICIARIES ON THE BASIS OF SIZE OF LAND HOLDINGS

Village	Size of land holding in Acres			Total
	Small (0-2.5)	Medium (2.5-5)	Large (above 5)	
V ₁	11 (25.0)	24 (54.5)	9 (20.5)	44 (100)
V ₂	23 (54.7)	10 (23.8)	9 (21.4)	42 (100)
V ₃	19 (34.5)	23 (41.8)	13 (23.6)	55 (100)
Total	53 (37.6)	57 (40.4)	31 (22.0)	141 (100)

The figures in brackets indicate percentage to total; **Sources:** Compiled from Questionnaires.

Table1 reveals that 37.6 percent beneficiaries belong to small and marginal farmers; the percent is highest in V₂ i.e., 54.7 percent. Large farmers occupy 22 percent share in total holdings of the district.

4.1.1. IMPACT ON IRRIGATION

The irrigation facilities include river, ponds and canals, pump sets, dug wells, drip irrigation, well with pump set etc. During the study it is found that there is no impact on irrigation in V₁ strata, but there is a great change in V₂ and V₃ groups after obtaining loans. The size of net cropped area is increased due to installation of pump sets, dug wells and well with pump set etc.

TABLE 2: PERCENTAGE CHANGE IN IRRIGATED LAND IN PRE-LOAN AND POST-LOAN PERIOD (Borrowers on the basis of operational holdings)

Size of Farmers	Percentage of irrigated land		Variation in Percentage Points
	Pre-loan	Post-loan	
Small & marginal (0-2.5)	21.3	21.3	-
Medium (2.5-5)	54.6	54.6	-
Large (above 5)	49.7	50.3	0.6
Total	46.6	47.2	0.6

Sources: Compiled from Questionnaires

4.1.2 IMPACT ON CROPPING PATTERN:

A change in cropping pattern needs more crop loans to enable the farmers to reap the benefits of advanced technology. The impact of Credit Co-operatives finance on cropping pattern in the present study is assessed on the basis of area cultivated under High Yield Variety (HYV) by comparing the post-loan with pre-loan periods.

TABLE 3: PERCENTAGE CHANGE IN THE USE OF HYV AND NON-HYV SEEDS BY BENEFICIARIES OF DIFFERENT OPERATIONAL HOLDINGS

Size	Percentage of area GCA				Change in percentage points of HYV seeds
	Pre-loan period		Post-loan period		
	HYV	Non-HYV	HYV	Non-HYV	
Small (0-2.5)	33.7	66.3	84.5	15.5	50.8
Medium (2.5-5)	45.6	54.4	96.3	3.7	50.7
Large (above 5)	68.2	31.8	100	5.1	26.7
Total	34.6	55.4	94.3	5.7	49.7

Sources: Compiled from Questionnaires

*GCA implies Gross Cropped Area

4.1.3. IMPACT ON USAGE OF FERTILIZERS, PESTICIDES AND MANURES

Agricultural crop loans enabled the farmers to apply proper dose of fertilizers, pesticides etc. at right time and to keep pace with the change in the new farm technology in agriculture. Supplying adequate loans at right time by the DCCB to the beneficiaries act as motivating factors.

TABLE 4: USAGE OF FERTILIZERS/ PESTICIDES ETC. PER ACRE IN PRE AND POST-LOAN PERIODS BY DIFFERENT SIZE OF BENEFICIARIES

Size	Usage of Fertilizer etc. per acre in Rs.		Growth in percentage
	Pre-loan period	Post-loan period	
Small (0-2.5)	200	375	87.5
Medium (2.5-5)	250	495	98.0
Large (above 5)	325	620	90.7
Total	268.4	496.7	85.1

Sources: Compiled from Questionnaires.

4.1.4. IMPACT ON LABOUR COST

Due to industrialization, manpower shifted to industrial sector by attracting higher wages. In order to turn back them to agriculture sector, the farmers have to offer high wages which results in an increase in labour cost. With the help of the agricultural crop loans, the cultivators are able to meet the labour cost at right time.

TABLE 5: LABOUR COST PER ACRE OF DIFFERENT SIZE OF FARMERS DURING PRE-LOAN AND POST-LOAN PERIOD

Size of cultivators	Labour cost per acre in Rs		Growth in percentage
	Pre-loan period	Post-loan period	
Small (0-2.5)	600	1000	66.7
Medium (2.5-5)	850	1500	76.4
Large (above 5)	1000	1950	95.0
Total	920.7	1537.3	67.0

Sources: Compiled from Questionnaires

4.1.5. IMPACT ON PRODUCTION

A change in cropping patterns results in an increase in the productivity of the farmers. Paddy is the major crop of sample villages and cultivation of other commodities is negligible. It is observed that the yield rate has increased irrespective of size of holdings. This might be due to the change in cropping patterns, intensive use of fertilizers and labour etc., which can be resulted by the provision of adequate credit in time by DCCB, Kakinada and its affiliated PACS.

TABLE 6: YIELD RATE OF PADDY PER ACRE OF DIFFERENT SIZE OF FARMERS DURING PRE-LOAN AND POST-LOAN PERIOD

Size of cultivators	Yield per acre in bags*		Growth in percentage
	Pre-loan	Post-loan	
Small (0-2.5)	18	24	33.3
Medium (2.5-5)	21	29	38.1
Large (above 5)	25	38	52.0
Total	22	32	45.5

Sources: Compiled from Questionnaires

* A bag contains 75 kg of paddy.

4.1.6. IMPACT ON INCOME LEVEL

Change in income level is the best indicator of assessing the impact of farm loans lent by the cooperative banks. There is a positive correlation between yield and income of the farmers. A rise in output automatically results in a raise in the income levels of farmer groups. For the analysis of agricultural term loan on income level of the borrower, two factors viz., income per borrower and income per acre have been taken into consideration. For computation of the income of sample borrowers, the prevailing market price of paddy has been taken into consideration. In order to compute income per acre the total income is to be divided by the total acres of land whether own or leased. When the total income is divided by the number of sample borrowers, it gives the income per borrower.

4.1.6.1. INCOME PER BORROWER

The increase in income levels of the beneficiaries can be analyzed by considering the increase in income per borrower and per acre.

TABLE 7: INCOME PER BORROWER PER ACRE OF DIFFERENT SIZE OF FARMERS DURING PRE-LOAN AND POST-LOAN PERIOD

Size of cultivators	Income per borrower in Rs.		Growth in percentage
	Pre-loan	Post-loan	
Small (0-2.5)	12,140	20,637	69.9
Medium (2.5-5)	15,234	25,222	65.6
Large (above 5)	19,836	31,228	57.4
Total	15,337	25,336	65.2

Sources: Compiled from Questionnaires.

The above table reveals that there is a significant increase in the incomes of the beneficiaries. The incomes of small farmers are raised by 69.9 percent, marginal farmers by 65.6 percent and large farmers by 57.4 percent. By analyzing the data, it is clear that the most benefitted group is small farmers when compared to large farmers.

4.1.6.2. INCOME PER ACRE

It is clear from the table 8 that the income per acre is high in case of large farmers and growth rate is high in case of small and marginal farmers. The impact of crop loan on all size of farmers is statistically significant.

TABLE 8: INCOME PER ACRE OF DIFFERENT SIZE OF FARMERS DURING PRE-LOAN AND POST-LOAN PERIOD

Size of cultivators	Income per Acre in Rs.		Growth in percentage
	Pre-loan	Post-loan	
Small (0-2.5)	6,218	10,466	68.3
Medium (2.5-5)	7,215	11,823	63.8
Large (above 5)	8,300	13,284	60.0
Total	6,730	11,117	65.2

Sources: Compiled from Questionnaires

4.2 IMPACT OF AGRICULTURAL TERM LOANS

The agricultural term loans are meant for long-term perspective and are used for development and investment purposes. Such loans can be payable over a number of years and helps the cultivators to proper infrastructure for agricultural development.

Table 9 reveals that 50.2 percent of total borrowers belong to small and marginal, 25.9 percent belongs to medium and remaining 26.8 percent belongs to large size farmers. The percentage of small farmers is more in V₂ group i.e., 54.7 percent than V₁ and V₃ sample groups. Big farmers are more in V₃ group when compared to other groups. Medium size farmers are also more in V₁ group having 28.6 percent.

TABLE 9: DISTRIBUTION OF SAMPLE BENEFICIARIES ON BASIS OF SIZE OF LAND HOLDING

Village	Size of land holding in Acre			Total
	Small (0-2.5)	Medium (2.5-5)	Large (above 5)	
V ₁	26 (53.1)	14 (20.6)	9 (18.4)	49 (100)
V ₂	29 (54.7)	13 (24.5)	11 (20.8)	53 (100)
V ₃	17 (41.4)	10 (24.4)	14 (34.1)	41 (100)
Total	72 (50.3)	37 (25.9)	34 (23.8)	143 (100)

Sources: Compiled from Questionnaires.

The figures in brackets indicate percentage to total.

4.2.1. IMPACT ON IRRIGATION

During the study it is found that there is no impact of agricultural term loans on irrigation in V₁ strata, but there is a great change in V₂ and V₃ groups after obtaining loans. The size of net cropped area has increased due to installation of pump sets, dug wells and well with pump set etc.

TABLE 10: IMPACT OF AGRICULTURAL TERM LOANS ON IRRIGATION (Borrowers on the basis of operational holdings)

Size of Farmers	Percentage of irrigated land		Variation in Percentage Points
	Pre-loan	Post-loan	
Small (0-2.5)	21.6	48.3	26.7
Medium (2.5-5)	24.3	54.2	29.9
Large (above 5)	31.6	63.1	31.5
Total	26.2	56.3	30.1

Sources: Compiled from Questionnaires

4.2.2. IMPACT ON CROPPING PATTERN

The agricultural term loan has a great role in providing the infrastructural facilities to agriculture. It is observed from the table 6.36 that the agricultural term loan has a significant impact on the small and marginal farmers in the adoption of HYV seeds over pre-loan to post-loan period. The impact is more in case of medium farmers than small farmers. In pre-loan period the medium farmers have adopted HYV seeds on 44 percent of Gross Cropped Area. In post loan period the percentage is increased 84.3 percent. The variation in percentage is 40.2 percent. It is known from the field survey that about 26 percent of small farmers did not utilize the loan in productive purposes. Due to this reason the impact on small farmers is probably less on the adoption of HYV seeds as compared to medium farmers in post-loan period.

TABLE 11: IMPACT OF AGRICULTURAL TERM LOANS ON CROPPING PATTERN ON DIFFERENT SIZE OF HOLDINGS

Size	Percentage of area GCA*				Change in percentage** points of HYV seeds
	Pre-loan period		Post-loan period		
	HYV	Non-HYV	HYV	Non-HYV	
Small (0-2.5)	53.9	46.1	86.1	13.9	32.2
Medium (2.5-5)	44.1	55.9	84.3	15.7	40.2
Large (above 5)	56.2	48.1	100.0	25.2	43.8
Total	48.7	51.3	86.2	15.6	39.5

*GCA implies Gross Cropped Area

** Difference between percentages HYV paddy in pre-loan and post-loan period

*** Total value is calculated on total Gross Cropped Area under ATL

Sources: Compiled from Questionnaires

With the help of Agricultural term loans the borrowers have been able to increase the use of HYV seeds from 48.7 percent to 86.2 percent of the total gross cropped area.

4.2.3. IMPACT ON USAGE OF FERTILIZERS, PESTICIDES AND MANURES

The expenditure on fertilizers, pesticides etc. per acre in total sample has increased from Rs.425 in pre-loan period indicating a growth of 110.8 percent. However the impact on small farmers is more as compared to other size of farmers.

TABLE 12: USAGE OF FERTILIZERS/ PESTICIDES ETC. PER ACRE IN PRE AND POST-LOAN PERIODS BY DIFFERENT SIZE OF BENEFICIARIES

Size	Usage of Fertilizer etc. per acre in Rs		Growth in percentage
	Pre-loan period	Post-loan period	
Small (0-2.5)	275	595	116.3
Medium (2.5-5)	350	765	118.5
Large (above 5)	625	1050	68.0
Total	425	896	110.8

Sources: Compiled from Questionnaires

4.2.4. IMPACT ON LABOUR COST

The agricultural term loan has a significant impact on labour cost per acre of all size of farmers irrespective of their land holdings.

TABLE 13: LABOUR COST PER ACRE OF DIFFERENT SIZE OF FARMERS DURING PRE-LOAN AND POST-LOAN PERIOD

Size	Labour cost per acre in Rs		Growth in percentage
	Pre-loan period	Post-loan period	
Small (0-2.5)	796	1424	78.9
Medium (2.5-5)	832	1116	34.2
Large (above 5)	1215	1906	56.9
Total	1050	1638	56.0

Sources: Compiled from Questionnaires.

4.2.5. IMPACT ON PRODUCTION

From the field survey it is observed that the term loan for the purchase of ploughs, bullocks and other implements have played an important role in increasing the yield of crops. This helps the borrowers to get timely service. The farmer who had taken loans for dug well, or pump set or dug well with pump set or land development is able to facilitate irrigation and to convert fallow land to agricultural field and thus increase their yield.

TABLE 14: YIELD RATE OF PADDY PER ACRE OF DIFFERENT SIZE OF FARMERS DURING PRE-LOAN AND POST-LOAN PERIOD

Size	Yield per acre in bags in Rs		Growth in percentage
	Pre-loan period	Post-loan period	
Small (0-2.5)	21	28	33.3
Medium (2.5-5)	25	32	28.0
Large (above 5)	25	38	52.0
Total	24	34	41.7

Sources: Compiled from Questionnaires; *A bag contains 75 kg of paddy.

4.2.6. IMPACT ON INCOME LEVEL

Irrigation facilities, change in cropping patterns and increase in yield rate eventually increase the income of the borrowers.

4.2.6.1. INCOME PER BORROWER

It can be concluded from the table 15 that the income per borrower has increased in all cases irrespective of size of holdings and sample group villages. However the growth of medium farmers' income is more than the small and big farmers i.e., 54.9 percent. The growth percentage is less in case of large farmers i.e., 39.5 percent.

TABLE 15: INCOME PER BORROWER PER ACRE OF DIFFERENT SIZE OF FARMERS DURING PRE-LOAN AND POST-LOAN PERIOD

Size of cultivators	Income per borrower in Rs.		Growth in percentage
	Pre-loan period	Post-loan period	
Small (0-2.5)	13,890	19,473	40.2
Medium (2.5-5)	15,750	24,396	54.9
Large (above 5)	18,915	26,386	39.5
Total	16,250	23,884	47.0

Sources: Compiled from Questionnaires.

4.2.6.2. INCOME PER ACRE

There is a significant raise in income per acre of sample beneficiaries.

TABLE 16: INCOME PER ACRE OF DIFFERENT SIZE OF FARMERS DURING PRE-LOAN AND POST-LOAN PERIOD

Size of cultivators	Income per Acre in Rs.		Growth in percentage
	Pre-loan period	Post-loan period	
Small (0-2.5)	6,478	10,332	59.5
Medium (2.5-5)	7,873	10,699	35.9
Large (above 5)	8,416	11,975	42.3
Total	7,896	11,607	47.0

Sources: Compiled from Questionnaires.

It is clear that the income per acre has increased from Rs. 7,896 to Rs.11,607 at percentage growth of 47 over pre-loan to post-loan period. The percentage growth rate is highest in case of small farmers. The increase in income per acre in all size of the farmers is significant.

5. CONCLUSION

By the beginning of 20th century, the GOI recognized the root causes of the indebtedness and poverty of the Indian farmers and started Credit Co-operatives to alleviate the poverty to some extent by relieving the Below Poverty Line (BPL) families from the vicious circle of poverty. Co-operative banks were established on the principle of co-operation. The main function of these banks is to relieve the poor farmers from the clutches of the money lenders and to provide adequate and timely credit at lower rates of interest. Sri Rajnath Singh (2006) called upon the Government to take necessary steps so that farmers may not have to pay more than 6 percent interest on the agricultural loans.

The institutional credit increases the purchasing power of the farmers and perhaps due to this reason there is an increase in the use of modern inputs in their farming procedures. It acts as a moral boost to farmers in increasing the productivity which ultimately improves their overall economic growth. Hence it can be said that agricultural credit and agricultural development goes by hand in hand. The present study clearly enunciated the advantages enjoyed through improved technology with the efforts of the cooperative bank for the beneficiaries in terms of high production, increased net returns and subsidiary incomes. The results further emphasized the need to enlighten the farmers about the superiority and profitability of improved technology through the extensive credit services. By and large the role of Credit Cooperatives is highly impressive and clearly exhibited in the socio-economic development gained by the beneficiaries.

The District Central Co-operative Bank, Kakinada being a farmer's bank in the district covered all 1327 villages and 54 Revenue Mandals by its wide network of 47 branches and 295 Primary agricultural Cooperative Societies providing services from the last 88 years. The role of the DCCB in the field of mobilization of deposits is highly significant. It collects unutilized savings of the public and mobilizes them in productive channels. The deposit mobilization of the DCCB enables the people of the rural area to recycle their funds particularly in the area of credit deployment. They are providing attractive interest rates on deposits.

In order to study the impact of Co-operative credit on agriculture, the beneficiaries were grouped into three categories depending upon the size of land holdings such as small, medium and large farmers. There was no significant impact of crop loans on large farmers whereas there was a significant impact on small and medium size farmers. When compared to large farmers, the crop loans played a very significant role in providing timely credit and inputs to small and medium farmers. The impact of Co-operative credit was analyzed by the modernization of agricultural process during the pre-loan and post-loan periods. There was an enormous increase in the usage of HYV seeds, modernized inputs, fertilizers and pesticides from pre-loan to post-loan period. The modern process of agriculture increased the yield per acre and also the income per acre which in turn increased the income of the sample borrowers. The farmers of the district were greatly benefited by the credit provision of the DCCB, Kakinada. The farmers have taken loans not only to increase the productivity, but to develop the process of cultivation as a whole.

The present study clearly enunciated the advantages enjoyed through improved technology with the efforts of the bank for the beneficiaries in terms of high production, increased net returns and subsidiary incomes. The results further emphasized the need to enlighten the farmers about the superiority and profitability of improved technology through the extensive credit services. By and large the role of cooperative loan is highly impressive and clearly exhibited in the socio-economic development gained by the beneficiaries. Finally it can be concluded that the cooperative credit has a significant impact on the small and marginal farmers in the district by providing adequate, cheap and timely credit to the farmers.

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