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Impact of Credit on Net Farm Income of Farmers in Chittoor District of Andhra Pradesh

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ABSTRACT

The comparison of results of model 1 (at existing technology with restricted capital) and model 2 (at existing technology with relaxed borrowing) using linear programming technique indicated the impact of credit when the farmers were allowed to borrow required short term credit. The net farm returns indicated by models S_1, M_1 and L_1 were Rs. 1,55,350, Rs. 2,21,123 and Rs. 4,77,018 for small, medium and large farms respectively when the cash availability was restricted to owned funds. When the farmers were allowed to borrow required credit to supplement owned funds, the net farm returns increased to Rs. 1,70,118, Rs. 2,47,077 and Rs. 5,69,583 on small, medium and large farms respectively. This showed that the credit played an important role in increasing income on all the categories of the farms in the study area.

Key words: *Credit, Net farm returns, Linear Programming.*

Credit, a double edged sword in agriculture, plays an important role in increasing the income as well as making situations topsy-turvy. Fixed costs and variable costs which are inbuilt in agriculture needs sufficient quantity of equity to suffice the situation. But meeting all cash requirements is impossible leading to the adoption of credit making it life blood to the existing situation. For a situation like Indian agriculture, where more than 70 per cent of farmers are populated by marginal and small categories, who are more susceptible to small changes, the need for credit from financial institutions is much sounding. With this objective in view, an attempt has been made in this paper to examine the impact of credit on net farm returns of different size farms.

MATERIAL AND METHODS

Chittoor district of Rayalaseema region in Andhra Pradesh was purposively selected for the present study. Out of sixty six mandals in Chittoor district, Punganur mandal having similar cropping pattern, soil, climate and other general conditions of the district was purposively selected for the study. All the villages in the selected mandal based on the gross cropped area were arranged in descending order and the first three villages were selected for a detailed study. The selected villages were Vanamaladinne, Aaradigunta and Raganipalle. Forty farmers were selected from each village randomly and they were post stratified into small (less than 2 hectares of dry land), medium (2-4 hectares of dry land) and large (greater than 4 hectares of dry land) using probability proportionate to size making a total sample of 120 farmers. The data on technical coefficients, prices paid and received by the farmers, family composition, size of farm etc. were collected from the selected respondents for the agricultural year 2016-17 by survey method.

The deterministic linear programming technique was chosen among various analytical tools available for allocation of available limited farm resources among alternative enterprises. In mathematical form, one year (two seasons) linear programming model was used considering only crop activities.

Maximize $Z = \sum_{i=1}^{n} C_j X_j$

j = 1 to n activities

Subject to following constraints

1. $\sum_{i=1}^{n} a_{ij} X_j$ e" b_i (i = 1,……...K)
2. $\sum_{i=1}^{n} a_{ij} X_j$ d" b_i (i = 1+K,…...m)
3. $\sum_{i=1}^{n} a_{ij} X_j = 0$ (i = m+1,…...v)
4. $\sum_{i=1}^{n} X_j \geq 0$ (non-negativity constraint)

Where,

Z = the objective function to be maximized in the year.

C_j = net returns from j^{th} activity in rupees during *kharif* and *rabi* seasons of the year.

X_j = level of j^{th} activity during *kharif* and *rabi* seasons of the year.

a_{ij} = the quantity/amount of i^{th} resource required per unit of j^{th} activity.

b_i = total availability of i^{th} resource on the farm.

With the help of above model, few variations were incorporated in the basic model.

Model 1:

In this model, cash availability of the farmers was restricted to owned funds at existing technology.

Model 2:

It is similar to model 1 but with complete relaxation of the loan amount available to farmers at existing technology.

Each of these two models were designed separately for small ($S_1$and S_2), medium ($M_1$and M_2) and large (L_1 and L_2) farmer categories respectively.

RESULTS AND DISCUSSION

Impact of Credit on Net Farm Income

The term relaxed capital (unrestricted capital) was defined as the provision of as much credit as needed by the farmers. Accepting this definition, the credit needs and their effect on net farm returns were assessed by comparing the optimum plans worked out with limited and unlimited capital availability. The impact of credit on net farm returns of small, medium and large farms is presented in Table 1.

The comparison of results of models 1 and 2 indicate the impact of credit, when the farmers were allowed to borrow required short term credit. The net farm returns indicated by models S_1, M_1 and L_1 were Rs 1,55,350, Rs 2,21,123 and Rs ,477,018 for small, medium and large farms respectively when the cash availability was restricted to owned funds. When the farmers were allowed to borrow required credit to supplement owned funds, the net farm returns increased to Rs 1,70,118, Rs 2,47,077 and Rs 5,69,583 on small, medium and large farms respectively. The increase of Rs 14,768 (9.5 per cent) on small farms, Rs 25,954 (11.7 per cent) on medium farms and Rs 92,565 (19.4 per cent) on large farms would be attributed to the external financial facilities and the consequential changes in the crop mix.

From the preceding discussion, it may be noted that credit played an important role in increasing income on all the categories of the farms. The greater potentiality of increase in net farm returns through borrowing adequate capital on large farms as compared to small and medium farms could be attributed to the higher productivity of capital on large farms. These findings are similar to the findings of Ramakrishnayya (1998), Rajeswari and Sastry (2011), Varalakshmi *et al.* (2011) and Vani *et al.* (2014).

Table 1. Impact of Credit on net farm Income of small, medium and large farms (in Rupees)

Category / Model	Existing technology		
	Model-1	Model-2	Change over Model-1
Small farmers	155350	170118	14768
			(9.50)
Medium farmers	221123	247077	25954
			(11.70)
Large farmers	477018	569583	92565
			(19.40)

Note: Figures in parentheses indicate percentages

Table 2. Borrowing, Repayment And Cash Transfers Under Different Optimum Models

S.No	Items	Small farmers		Medium farmers		Large farmers	
		S_1	S_2	M_1	M_2	L_1	L_2
1.	Borrowing in *kharif*	-	28340	-	79737	-	151421
2.	Repayment in *rabi*	-	30040	-	84522	-	-
	At the end	-	-	-	-	-	169592
3.	Cash transfer Kharif to rabi	-	-	-	-	-	-
	Rabi to Z	111187	125956	84781	110736	137424	296618

Resources were optimally allocated with two levels of capital availability i.e. limited (models S_1, M_1 and L_1) and unlimited capital (models S_2, M_2 and L_2). Limited capital means existing, owned capital availability. Full relaxation of borrowing was incorporated in model S_2 which helped in the estimation of short term credit requirement of small farmers. Model S_2 results suggested that the small farmers required credit to the extent of Rs 28340 for the optimization of resources at the currently practiced technology. The entire loan amount with interest Rs 30040 was repaid in *rabi* season. Model M_2 suggested to borrow Rs 79737 in *kharif* for reorganisation of resources under existing technology on medium farms and the entire loan amount with interest (Rs 84,522) was repaid in *rabi* season. Model L_2 results indicated that the large farms needed credit to the extent of Rs 1,51,421 for the optimization of resources at currently followed technology. The entire loan amount with interest (Rs 1,69,592) was repaid at the end.

From the above analysis, it is evident that the substantial amount of capital was borrowed in the process of optimization. Capital borrowed varied directly with the size of the farm. The results of optimum models of small and medium farmers suggested the repayment of *kharif* loan in *rabi* season along with appropriate interest amount. This was mainly because of generation of sufficient income from the sale of *kharif* crop enterprises. These findings are similar to the findings of Varalakshmi *et al.* (2011) and Vani *et al.* (2014).

CONCLUSION

Credit played an important role in increasing income and employment even under existing technology. The impact of credit was more under large farms compared to small and medium farms. There is an immense scope for increasing net farm returns on small, medium and large farms through reorganisation of resources. When the borrowing of credit was relaxed, the prospects of income and employment were further enhanced. There existed direct relationship between credit needs and the size of the farm.

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