Effect of *"Irkoy Gomni"* Micro-credit scheme on Resource-Use in cattle fattening in Tillabery Region of Niger Republic.

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Abstract

This study was carried out to ascertain whether credit obtained for cattle fattening has had any meaningful contribution to the resources used by the beneficiary farmers in Kollo LGA of Tillabery Region Niger Republic. One hundred loan beneficiary cattle fattening farmers were randomly selected out of a sampling frame of 732 beneficiaries with not less than 5 borrowing circles. One hundred non-beneficiary cattle fatteners who were immediate neighbours of the sampled beneficiaries were also randomly selected from an established sampling frame obtained from the village heads to make a total sample size of 200, comprising of 100 beneficiaries and 100 non beneficiaries. Data were analyzed using descriptive statistics, chi-square and multiple regressions. The results showed that cattle fattening was the most preferred economic activity for both the beneficiaries (94%) and their non beneficiary counterparts (91%). The chi-square value (5.192) showed no significant difference in preferences of the economic activities between the two sets of farmers. Credit delivered to the beneficiaries enabled them use higher quantities of feed (P<0.01)and labour resources (P<0.1) than their non-beneficiary counterparts. Similarly, credit delivered has brought about significant increase (P<0.01) in revenue accrued to the fattening business of the beneficiary farmers. Based on the results, it is recommended that the scope of the credit be expanded to cover more farmers in the area.

Key words: Micro-credit, Resource-Use, cattle, fattening

Introduction

Each region in Niger Republic is currently working hard to develop its agribusiness potential. This requires that they identify commodities in which their region has a comparative advantage. Kollo LGA has identified fattening beef cattle as a competitive activity for farmers in the area. It gives the farmers year-round work and provides them with extra income. They can make use of different assorted farm by-products such as millet stalk, rice straw, rice bran, sugarcane tops which

ordinary go to waste to feed their animals. The number of livestock in Kollo LGA is estimated to be 189,937.81 Tropical Livestock Units (TLU) with available roughage of 321,062.190 metric tons which is more than enough in term of dry matter content (DDRA/KOLLO (2009).

A fattening operation conducted in Libore in Kollo LGA between 1980 to1985 on loan beneficiary farmers with amount distributed ranging from 50,000 to75,000 Fcfa per farmer revealed through farm budgeting analysis that farmers were

gaining net profit ranging between 10,000 to 25,000Fcfa,(SAEIA/KOLLO,1985). Also another fattening study conducted on sheep in Senegal as reported by Charles (2000) shows that farmers are gaining profit of up to 50,000Fcfa. A fattening project conducted using local breeds such as *Djielli, Azawak, and Bororo* produced profits that created positive incentives to producers and reflected an efficient use of domestic resources. Participating farmers like appreciated the use of these breeds because the average increase in weight is good (between 500g to 1,200g/day), (DDRA/KOLLO,2009). At such rate of gain, it takes three to four months to achieve a selling weight of 350 to 400kg. Similarly, due to the reduced length of time during which capital is tied up, farmers felt that profits realized in fattening the local breeds were significantly high because of reduced interest cost. Through this project poor people especially women can earn additional income which will be helpful for their livelihood.

This study was carried out to ascertain whether credit obtained has had any meaningful contribution to the resources used by the beneficiary farmers. The information might be useful in deciding whether there was any need for scaling-up credit delivery for cattle fattening in the study area.

Methodology
The Study Area

The study was conducted in Kollo Local Government Area (LGA) of Tillabery State in Niger Republic. Kollo LGA is situated in the sahel vegetational zone and lies between Latitudes 12^0 30′ and 13^0 53′ North and Longitudes $1^030′$ and $2^055′$ East. It shares common borders with Dosso State in the East, Filingue and Ouallam LGAs in the North, Tillabery and Tera LGAs in the West and Say LGA in the South. It covers a land area of approximately 9,408 square kilometers and has a population of about 418,912, *Service Departmental du Development Communautaire (SDDC) (*2009). The climate is characterized by wet and dry seasons. The latter comprises a dry and cool period (Harmattan) followed by a hot weather. Rainfall starts in late June and ends in early September, mean annual rainfall ranges from 300 to 500 mm (SDDC, 2009). The system of livestock husbandry is intensive and semi-intensive types. The most common animals found include cattle, goats, sheep, camels, horses and donkeys. Animals rely on natural grazing and crop residues as their sources of feed, however, generally there is lack of drinking water for livestock.

Sampling technique

From the list of beneficiaries obtained at the bank, 732 beneficiaries with at least five borrowing cycles were sorted out from which 100 farmers were randomly selected for the study. Beneficiaries with not less than five borrowing cycles experience were chosen because they would have had measurable impact as explained by Sunita (2003) that some indicators could be verified in cases where people benefited from such a programme at least for not less than five cycles. In this case, the accumulated benefits of the previous loans and their incomes, as well as the increased experience of the beneficiaries in

managing the loan efficiently contributed to help in consumption smoothing as well as in asset building. One hundred non-beneficiary cattle fatteners who were immediate neighbours of the sampled beneficiaries were also randomly selected from an established sampling frame obtained from the village heads to make a total sample size of 200, comprising of 100 beneficiaries and 100 non beneficiaries.

Data collection

Primary data were collected using questionnaires administered by the researchers with the help of trained enumerators between October to December 2010. The period chosen corresponded to the time when farming activities were almost finished and people were less busy. Data collected covered variables such as amount of credit received by the beneficiaries, quantities of labour, feed, medication, water and housing . Current market prices were used to put values on the variables considered .The variables used in estimating the consumption pattern were calculated on monthly basis and then reported for the year. The housing component was evaluated using straight-line- method of depreciation.

Data analysis

Regression analysis and chi-square were the main analytical tools used. Data collected were analyzed using Statistical Package for Social Sciences (SPSS) software (version 16). Data generated from the study were subjected to several algebraic forms amenable for regression analysis , such as linear model, double log , quadratic functions as represented in the following equations .The function that gives the best fit in terms of R^2, direction, magnitude and significance of the regression coefficient was selected .The function was estimated through multiple regression analysis. The regression model employed in the study is of the general implicit form:

$$Q = f(x_1, x_2, x_3, x_4, x_5, x_6, x_7 + \ldots + e) \text{------------------------------(1)}$$

Where;

Q = final weight of animal (in kg)

X_1 = weight of stock (in kg)

X_2 = medication (in mg)

X_3 = feeds (in kg

X_4 = labour(in man-day)

X_5 = Water intake (in liters)

X_6 = housing (in m^2)

X_7 = access to credit (dummy variable whereby beneficiary is scored 1and zero, otherwise) e = error term

Access to credit was used as dummy variable to demarcate between beneficiaries and non beneficiaries. Dummy variable is quite a versatile variable because it can be used to show differences in the constant terms of regression equations estimated for categories of observations. It can also be used to show differences in the regression coefficients of the same variables in different categories. The point to note here is that, instead of estimating a separate regression equation for each group, we have been able to estimate one equation for both groups and at the same time show the difference between them (Olayemi,1998).

The linear function estimated is of the general form:

$$Q = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + e \text{----------------------------(2)}$$

Where: Q, x_1 to x_7,   are as earlier defined

a = intercept term

b_1-b_7 = regression coefficients

The quadratic function is estimated as follows:

Q = a + b_1x_1 + b_2x_2 +b_3x_3 +b_4x_4 +b_5x_5 +b_6x_6 +b_7x_7 - $b_8x_1^2$ - $b_9x_2^2$ -$b_{10}x_3^2$ -$b_{11}x_4^2$ - $b_{12}x_5^2$ -$b_{13}x_6^2$ - $b_{14}x_7x_1$ x_2x_3 $x_4x_5x_6$ x_7.......... +e -----------------------(3)

The power function is specified as follows:

Q = a $x_1^{b1}x_2^{b2}x_3$ $^{b3}x_4^{b4}x_5^{b5}x_6^{b6}$ x_7^{b7}.............. +e.- --------------------(4)

This is usually expressed in logarithmic form as:

LogQ =loga+ $b_1$log x_1 + $b_2$logx_2 +$b_3$logx_3 +$b_4$logx_4 +$b_5$logx_5 +$b_6$logx_6 +$b_7$logx_7 + loge…..(5)

Results and Discussion

People in Kollo LGA are engaged in a number of economic activities to earn a living. Common activities in the area were identified and presented to the farmers to select the most preferred in terms of income generation and the result is presented in table 1. The Table indicates that majority of both beneficiaries (94%) and non beneficiaries (91%) choose fattening as the most preferred economic activity. This finding may not be unconnected with the fact that the study area fell within the sahelo-saharian zone which is only conducive for animal husbandry (SDR, 2003) on the one hand. On the other, the high preference for fattening exhibited by the two categories of farmers may be associated to the closeness of the study area to the country's state capital (Jean, 1993) bringing about increased demand for meat. This implies that giving the necessary incentives to the two sets of farmers, all of them will engage in livestock fattening business. This shows the important place fattening enterprise occupies in the lives of the two sets of farmers in the study area. The chi-square statistics depicted no significant difference between beneficiaries and non beneficiaries the most preferred economic activities.

Table 1: Farmers response to the most preferred economic activities

Expectation	Beneficiaries		Non beneficiaries	
	F	**%**	**F**	**%**
Fattening	94	94	91	91
Rearing sheep	1	1	3	3
Petty trade	4	4	3	3
Crop Marketing	1	1	0	0
Buy cart	0	0	1	1
Dry season farming	0	0	2	2
Total	100	100	100	100

Field survey 2010

χ^2 = 5.192[ns]   (p <0.10), df = 5

Table 2 presents results of the regression analysis. Credit was assigned a dummy variable to demarcate between beneficiaries and non beneficiaries. Double log, Linear, Semi-log and Quadratic regression models were used for the estimation (Maikasuwa, 2007). Semi-log model was selected to be the lead-equation based on the fact that it provided the best fit. The statistical criteria used to assess the fitness of the models were the coefficient of determination (R^2), the F- statistic and the t- statistic.

The R^2 denoted the percentage of variation in the dependent variable that was accounted for by the variation in the independent variables (Thomas, 2007). The value for the coefficient of determination for the model was 0.872 which implied that 87.2 % of the variation in the revenue generated from the enterprise was explained by variation in the explanatory variables used in the model while the remaining proportion not explained was attributed to the error or random distribution in the model.

The coefficients of all the explanatory variables except water and housing (X_5 and X_6) were positive .The positive coefficient of these variables indicated that they contributed more in determining the output of the beneficiaries. The negative coefficient of X_5 and X_6 suggested that they contributed more in determining the output of the non beneficiaries. Three of these explanatory variables i.e. credit (X_7), feed (X_3) and labour (X_4) were significant at 1%, 1% and 10%, respectively meaning that they had significant contribution to the output of the beneficiaries. This suggested that an increase in the use of these resources while keeping others constant would significantly increase the output of beneficiaries. This finding concurs with Olagunju (2007) Who explained that increase in feeds and labour due to credit would be translated into increase in output and income of the beneficiaries. Credit was significant at 1% meaning that it was a crucial variable and had brought about significant increase in revenue generating capacity of the beneficiaries from cattle fattening. This is in line with Damisa *et al.*, (2010) who reported a significant positive impact of credit on livestock productivity. Awotide *et al.*, (2010) realized an increase in the foundation stock of cattle from 43 to 53 due to credit.

The F-test showed the overall test of significance of the regression equation and was significant at 1% level showing that the regression equation was fit. On the whole, beneficiaries income increased more than that of non beneficiaries. This should be attributed to the credit support given to the beneficiaries by the scheme

Table 2: Regression results showing factors influencing output in cattle fattening

Variables	Regression Coefficient			
	Linear	Semi-log	Double log	Quadratic
Stock	-0.0168	0.081	0.169	-140.814
	(-0.011)	(0.427)	(0.416)	(-0.145)
Medi-care	0.064	0.000	0.31	0.060
	(1.038)	(0.589)	(0.489)	(0.460)
Feed	0.412	0.001	0.476	0.182
	(82.789***)	(17.305***)	(9,370***)	(399.806***)
Labour	-0.079	0.006	0.003	-0.019
	(-0.302)	(1.779*)	(0.011)	(-0.026)
Water	0.002	-6.253	0.216	0.0000 2
	(0.500)	(-1.07)	(0.605)	(0.249)
Housing	0.228	-0.002	0.033	1.216
	(1.321)	(-1.035)	(1.049)	(0.743)
Credit	-0.168	0.098	-	343.853
	(1.157)	(4.412***)	-	(0.980)
	1.649	4.818	0.552	-106.467
Constant	(0.686)	(161.162***)	(0.190)	(-0.392)
R^2	99.4	87.2.0	81.9	100
F- value	4639***	8.923***	14.850***	134500***

Source: Field survey, 2010.
  ***: significant at 1%   ,   **: significant at 5% , * significant at10%
  figures in brackets are t values

Conclusion and Recommendations

From the results of the study, it can be concluded that, cattle fattening was the most preferred economic activity in the study area. Also, credit delivered to the beneficiaries enabled them use significant amount of feed and labour resources. Similarly, credit delivered has brought about increase in revenue accrued to the fattening business of the beneficiary farmers. Based on the results, it is recommended that the scope of the credit be expanded to cover more farmers in the area. Ultimately, this shall bring about increase in the standard of living of more people in the area.

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