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Impact of RKVY project on income distribution pattern of beneficiaries of sheep Rearers in Chittoor district of Andhra Pradesh

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Abstract
A survey was conducted with a sample of 38 sheep beneficiaries of Rashtriya Krishi Vikas Yojana (RKVY) programme from selected mandals in Chittoor district, A.P, to study the Income distribution pattern among the beneficiaries of sheep rearing. The net income was found to be Rs.24, 082, Rs.62, 041 and Rs.1, 04,559 in respective years covering 2010-11, 2011-12 and 2012-13. The savings pattern indicated that there is an increase from Rs.1, 48,883 in first year to Rs.1, 91,612 in the third year. The Gini concentration ratios in respect to the incomes were found to be 0.5765, 0.5455, 0. 4987 in 1st, 2nd and 3rd years, respectively The income distribution pattern as revealed by Gini concentration ratio showed that the income inequalities found to decrease among the beneficiaries as the time progressed.

Keywords: Gini concentration ratio, Income distribution, net income, Sheep rearers, RKVY, savings pattern

Introduction

Sheep with its multi-facet utility as a producer of meat, wool, skin, manure and milk to some extant has an added advantage of survival in low vegetation areas since the prospects of providing irrigation facilities to drought prone areas in the near future is bleak. In such a situation, sheep rearing may help to alleviate poverty of rural poor by earning additional income for their family which will ultimately improve their standard of living. Rural poor and marginal farmers earn supplementary income from rearing of small ruminants. To spur growth in Agriculture and allied sectors, the National Development Council (NDC) in its meeting held on 29th May, 2007 resolved that a special Additional Central Assistance Scheme called Rashtriya Krishi Vikas Yojana (RKVY) be launched, to bring about quantifiable changes in the production and productivity of various components of Agriculture and allied sectors. Accordingly Government of Andhra Pradesh has identified Sri Venkateswara Veterinary University as one of the nodal agencies to implement the RKVY project. As part of RKVY programme, the university in the year 2009-10 identified Livestock Research Station (LRS) Palamaner to supply Superior Germplasm of Nellore sheep to the needy farmers that aims in genetic improvement of farmers flocks and in turn bring about improvement in socio-economic status of downtrodden rural poor. Hence the present study to assess the economic impact of the RKVY Programme on its beneficiaries of sheep.

Material and Methods

The primary decree of the Rashtriya Krishi Vikas Yojana (RKVY) project located at LRS, Palamaner, Chittoor district of Andhra Pradesh is to supply superior germ plasm of breeding rams to the needy farmers of the state. Desired number of superior breeding rams depending upon the flock size are distributed to the selected farmers, along with other inputs like concentrate feed, medicines and vaccines. In addition minimum training in feeding, breeding and other routine farm operations are imparted to the beneficiaries. They are properly advised about the importance of record keeping. A total number of 38 beneficiaries were selected as sample for the study within the selected mandals of Chittoor district. This number was based on the criterion that they should have completed a minimum period of 3 years in running the enterprise. To measure the income distribution aspects Gini concentration ratio was used.

Gini coefficient of inequality

Gini coefficient of inequality was defined as the proportion of area under diagonal line which is known as Lorenz curve. Its value ranges from 0 to 1. More equal the income distribution the ratio is closer to zero. If the degree of inequality is greater, the ratio will be close to 1. A Gini ratio of zero would mean that every individual would receive the exactly the same income, while a ratio of one would mean an individual received all the income. The following formula was used to calculate the Gini concentration ratio:

$$GCR = 1 - \sum P_j (Q_j + Q_{j-1})$$

Where

GCR = Gini concentration ratio
P_j = Proportion of families in the jth group
$Q_j + Q_{j-1}$ = Cumulative proportion of incomes in the jth & j_{-1}^{th} farm households

Results and Discussion
Impact of productive assets on family expenditure, income and savings
Family expenditure pattern of sheep rearers

The total family expenditure calculated was Rs.59, 935, Rs.63, 040 and Rs.66, 017 in the 1st, 2nd and 3rd years, respectively. The contribution of food among the total family expenditure was Rs.37, 926 (63.27%), Rs.39, 758 (63.06%) and Rs.41, 526 (62.9%) in the respective years covering 2010-11, 2011-12 and 2012-13. Expenditure towards clothing accounted for Rs.3, 675 (6.13%), Rs.3, 783 (6%), and Rs.3, 805 (5.76%) in the 1st, 2nd and 3rd years, respectively. Regarding fuel and electricity, it was found to be Rs.9, 055 (15.11%), Rs.9, 758 (15.48%), and Rs.10, 690 (16.19%) in the respective years.

Another important component *i.e.* health was found to be Rs.2, 330 (3.89%) in the 1st year, 2,415 (3.84%) in the 2nd year and Rs.2, 495 (3.78%) in the 3rd year. When expenditure towards education was calculated, it worked out to be Rs. 5,844 (9.75%), Rs. 6,158 (9.77%) and Rs. 6,253 (9.47%) in the respective years. The miscellaneous expenditure was found to be Rs.1, 105 (1.85%), Rs.1, 168 (1.85%) and Rs.1, 248 (1.9%) in the respective years.

Table 1: Family expenditure pattern of selected sheep farmers

Items	1st Year (2010-11)	2nd Year(2011-12)	3rd Year(2012-13)
Food (Rs.)	37926 (63.27%)	39758(63.06%)	41526 (62.9%)
Clothing (Rs.)	3675 (6.13%)	3783 (6%)	3805 (5.76%)
Fuel and Electricity (Rs.)	9055 (15.11%)	9758 (15.48%)	10690 (16.19%)
Health (Rs.)	2330 (3.89%)	2415 (3.84%)	2495 (3.78%)
Education (Rs.	5844 (9.75%)	6158 (9.77%)	6253 (9.47%)
Miscellaneous (Rs.)	1105 (1.85%)	1168 (1.85%)	1248 (1.9%)
Total (Rs.)	59935 (100%)	63040 (100%)	66017 (100%)

Income pattern of selected sheep farmers

A glance at Table 2 revealed that the gross income was arrived at Rs.2, 95,036 in the 1st year, Rs.3, 11,461 in the 2nd year, and Rs.3, 45,336 in the 3rd year. The net income was found to be Rs.24, 082, Rs.62, 041 and Rs.1, 04,559 in respective years.

Table 2: Income pattern of selected Sheep farmers

	1st Year	2nd Year	3rd Year
Gross Income (Rs.)	295036	311461	345336
Net Income (Rs.)	24082	62041	104559

Saving pattern of selected sheep farmers

The results indicated that savings accounted for Rs.1, 48,883 in the 1st year, Rs.1, 61,619 in the 2nd year, and Rs.1, 91,612 in the 3rd year. It was also observed that savings have increased progressively with the passage of time (Table 3). The increase in net return would always lead to increase in savings, which a farmer could use for other purposes making the sheep rearing tenable. Almost similar feelings were echoed by Gupta *et al.,* (2011) [2].

Table 3: Saving pattern of selected sheep farmers

	1st Year	2nd Year	3rd Year
Gross Income (Rs.)	295036	311461	345336
Total Variable Cost (Rs.)	86218	86802	87707
Family Expenditure(Rs.)	59935	63040	66017
Saving (Rs.)	148883	161619	191612

Savings = [(Gross income) – (Total Varaiable costs + Family expenditure)]

Income distribution pattern
Distribution of farmers according to income during 1st year

Results from Table 4 indicated that, 2.63% of farmers had fallen in the income range of below Rs.30, 000 and had a share of 0.67% of average income, whereas 2.63% of the farmers had fallen in the income range between Rs.30, 000-60,000 and had a share of 2.53% of average income. The farmers with the income range between Rs.60, 000-90,000 was 23.70% with a share of 3.40% of average income, whereas 13.15% of the farmers had fallen in the income range between Rs.90, 000-1, 20,000 and recorded a share of 4.30% of average income.

The percentage of farmers with the income range between Rs.1, 20,000-1, 50,000 was 7.90% and had a share of 5.35% of average income. The farmers with the income range between Rs. 1,50,000-1,80,000 was 18.42% and had a share of 6.80% of average income, whereas 10.52% of the farmers had fallen in the income range between Rs. 1,80,000-2,10,000 and recorded a share 8.12% of average income. The farmers with the income range between Rs. 2, 10,000-2,40,000 was 5.26% and had a share of 10.08% of average income. The percentage of farmers with the income range between Rs. 2, 40,000-2, 70,000 was 7.9% and had a share of 10.43% of average income. Among the farmers with 2.63% had fallen in the income range between Rs. 2,70,000-3,00,000 and had a share of 11.67% of average income, whereas 2.63% of the farmers had fallen in the income range between Rs. 3,00,000-3,30,000 and recorded a share 13.58% of average income. The percentage of farmers with the income range between

Rs.5, 30,000-5, 70,000 was 2.63% and had highest share of 23.07% of average income. The highest number of farmers *i.e.* 23.70% had fallen in the income range Rs. 60,000-90,000 and their share in the total average income stood at 3.40%.

Table 4: Distribution of farmers according to income during 1st year

Class intervals (Rs.)	Percentage of farmers	Cumulative percentage of farmers	Average income per farmer (Rs.)	Percentage of aggregate income	Cumulative percentage of income
0-30000	2.63	2.63	15650	0.67	0.67
30000-60000	2.63	5.26	59050	2.53	3.2
60000-90000	23.70	28.96	79072	3.40	6.6
90000-120000	13.15	42.11	100268	4.30	10.9
120000-150000	7.90	50.01	124683	5.35	16.25
150000-180000	18.42	68.43	158433	6.80	23.05
180000-210000	10.52	78.95	189220	8.12	31.17
210000-240000	5.26	84.21	234800	10.08	41.25
240000-270000	7.9	92.11	243200	10.43	51.68
270000-300000	2.63	94.74	271850	11.67	63.35
300000-330000	2.63	97.37	316410	13.58	76.93
330000-360000	-	97.37	-	-	76.93
360000-390000	-	97.37	-	-	76.93
390000-420000	-	97.37	-	-	76.93
420000-450000	-	97.37	-	-	76.93
450000-480000	-	97.37	-	-	76.93
480000-510000	-	97.37	-	-	76.93
510000-540000	-	97.37	-	-	76.93
530000-570000	2.63	100	537650	23.07	100
570000-600000	-				
600000-630000	-				
630000-660000	-				
660000-690000	-				
690000-720000	-				
720000-750000	-				

Distribution of farmers according to income during 2nd year

The findings in Table 5 depicted the income distribution pattern of farmers during the 2nd year. It was revealed that 11.11% share of the farmers are in the income range between 60,000-90,000 with an average income of 3.4%. The percentage of farmers with the income range between Rs.90,000-1,20,000 was 22.22% with a share of 4.44% of average income, whereas 13.9% of the farmers each had fallen in the income range between Rs.1,20,000-1,50,000 and Rs.1,50,000-1,80,000 had a share of 6.04% and 7.12% of average income, respectively.

The farmers with the income range between Rs. 1,80,000-2,10,000 was 8.34% and had a share of 7.7% of average income, whereas 11.11% of the farmers each had fallen in the income range between Rs.2,10,000-2,40,000 and Rs.2,70,000-3,00,000 had a share of 9.7% and 11.74% of average income, respectively.

The percentage of farmers with the income range between Rs.2,40,000-2,70,000, Rs.3,00,000-3,30,000 and Rs.6,00,000-6,30,000 was 2.77% had a share of 10.36%, 13.65%, 25.85% of average income, respectively. The highest share of 25.85% of average income was observed in the income range between Rs. 6, 00,000-6, 30,000. Among all other farmers, the highest number of farmers *i.e.* 22.22% had fallen in the income range of Rs. 90,000-1, 20,000 and their share was only 4.44%.

Table 5: Distribution of farmers according to income during 2nd year

Class intervals (Rs.)	Percentage of farmers	Cumulative percentage of farmers	Average income per farmer (Rs.)	Percentage of aggregate income	Cumulative percentage of income
0-30000	-	-	-	-	-
30000-60000	-	-	-	-	-
60000-90000	11.11	11.11	81025	3.40	3.40
90000-120000	22.22	33.33	105781	4.44	7.84
120000-150000	13.90	47.23	143680	6.04	13.88
150000-180000	13.90	61.13	168978	7.12	21.0
180000-210000	8.34	69.47	183053	7.70	28.70
210000-240000	11.11	80.58	230835	9.70	38.40
240000-270000	2.77	83.35	246550	10.36	48.76
270000-300000	11.11	94.46	279200	11.74	60.50
300000-330000	2.77	97.23	324910	13.65	74.15
330000-360000	-	97.23	-	-	74.15
360000-390000	-	97.23	-	-	74.15
390000-420000	-	97.23	-	-	74.15
420000-450000	-	97.23	-	-	74.15
450000-480000	-	97.23	-	-	74.15
480000-510000	-	97.23	-	-	74.15

510000-540000	-	97.23	-	-	74.15
530000-570000	-	97.23	-	-	74.15
570000-600000	-	97.23	-	-	74.15
600000-630000	2.77	100	614650	25.85	100
630000-660000	-				
660000-690000	-				
690000-720000	-				
720000-750000	-				

Distribution of farmers according to income during 3rd year

Results presented in Table. 6 explain the income distribution pattern of farmers during 3rd year. The percentage of farmers with the income range between Rs.60, 000-90,000 was 5.57% and had a share of 2.47% of average income. The particulars revealed that 11.11% of farmers each had fallen in the income range between Rs.90,000-1,20,000, Rs.1,50,000-1,80,000 and Rs.1,80,000-2,10,000 and had a share of 3.6%, 5.04%, 6.16% of average incomes, respectively. Nearly 13.9% of the farmers each had fallen in the income range between Rs.1,20,000-1,50,000, Rs.2,10,000-2,40,000 and had a share of 4.22% and 7.07% of aggregate income, respectively. Whereas 8.33% of farmers each had fallen in the income range between Rs.2,40,000-2,70,000, Rs. 2,70,000-3,00,000 and Rs. 3,00,000-3,30,000 had a share of 8.04%, 8.78% and 9.7% of average incomes, respectively. About 2.77% of the farmers each had fallen in the income range between Rs.

3,30,000-3,60,000, Rs. 3,90,000-4,20,000 and Rs. 6,90,000-7,20,000 and had a share of 10.62%, 12.23% and 22.07% of average incomes, respectively.

The highest share of 22.07% of average income was observed in the income range between Rs. 6, 90,000-7, 20,000. Among all other farmers, the highest number of farmers *i.e.* 13.9% had fallen in the income range between of Rs.1,20,000-1,50,000, Rs.2,10,000-2,40,000 and had a share of 4.22% and 7.07% of aggregate income, respectively.

Thus it could be inferred that the intervention of RKVY has created an impact on the income augmentation of the rearers by giving valuable inputs in the form of superior breeding rams and technical knowledge. The knowledge and skills imparted could have led to the improvement in economic status of sheep farmers. The impact of technical skills imparted under the project were also corroborated by Senthil kumar *et al.,* (2013) [4] while studying the impact of KVK training on sheep farming.

Table 6: Distribution of farmers according to income during 3rd year

Class intervals (Rs.)	Percentage of farmers	Cumulative percentage of farmers	Average income per farmer (Rs.)	Percentage of aggregate income	Cumulative percentage of income
0-30000	-	-	-	-	-
30000-60000	-	-	-	-	-
60000-90000	5.57	5.57	79000	2.47	2.47
90000-120000	11.11	16.68	114362	3.60	6.07
120000-150000	13.90	30.58	135010	4.22	10.29
150000-180000	11.11	41.69	160650	5.04	15.33
180000-210000	11.11	52.8	196847	6.16	21.49
210000-240000	13.90	66.7	225760	7.07	28.56
240000-270000	8.33	75.03	256933	8.04	36.60
270000-300000	8.33	83.36	280000	8.78	45.38
300000-330000	8.33	91.69	309416	9.70	55.08
330000-360000	2.77	94.46	339150	10.62	65.70
360000-390000	-	94.46	-	-	65.70
390000-420000	2.77	97.23	390510	12.23	77.93
420000-450000	-	97.23	-	-	77.93
450000-480000	-	97.23	-	-	77.93
480000-510000	-	97.23	-	-	77.93
510000-540000	-	97.23	-	-	77.93
530000-570000	-	97.23	-	-	77.93
570000-600000	-	97.23	-	-	77.93
600000-630000	-	97.23	-	-	77.93
630000-660000	-	97.23	-	-	77.93
660000-690000	-	97.23	-	-	77.93
690000-720000	2.77	100	704550	22.07	100
720000-750000	-	-	-	-	-

Quantification of measure of distribution of income

The changes in the distribution pattern of income were quantified with the help of Gini concentration ratio. The Gini concentration ratios in respect to the incomes were found to be 0.5765, 0.5455,0. 4987 in 1st, 2nd and 3rd years, respectively (Table 7). The distribution pattern was also illustrated through Lorenz curves in Figure 1. The Lorenz curve was positioned relatively away from the equality line in the first year and it was relatively closer in the second and third year showing the

reduction of income inequalities. These results had evidently indicated that the stabilization of the enterprise with passage of time had narrowed down the income inequalities among the beneficiaries. Quantification of measure of distribution of income is generally done to study the income inequalities. The results were corroborated by the findings of Palanchamy *et al.,* (2007) [3] in Tamilnadu. Whereas the results of Ambika (2003)[1] revealed a contradictory picture where the findings had shown that sheep were inequality increasing source.
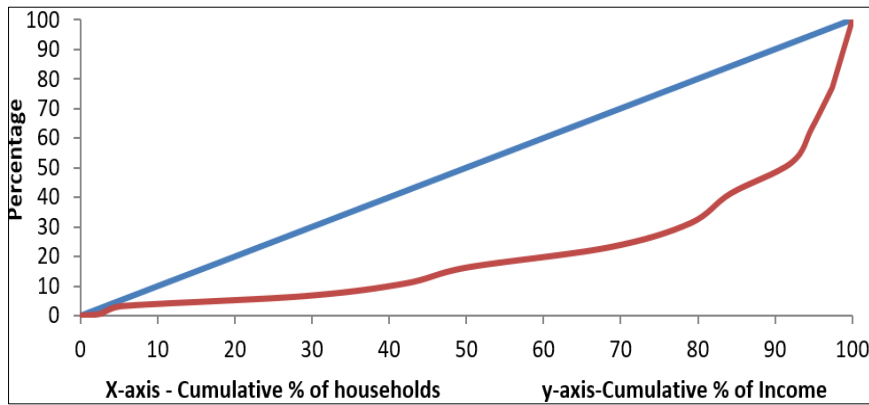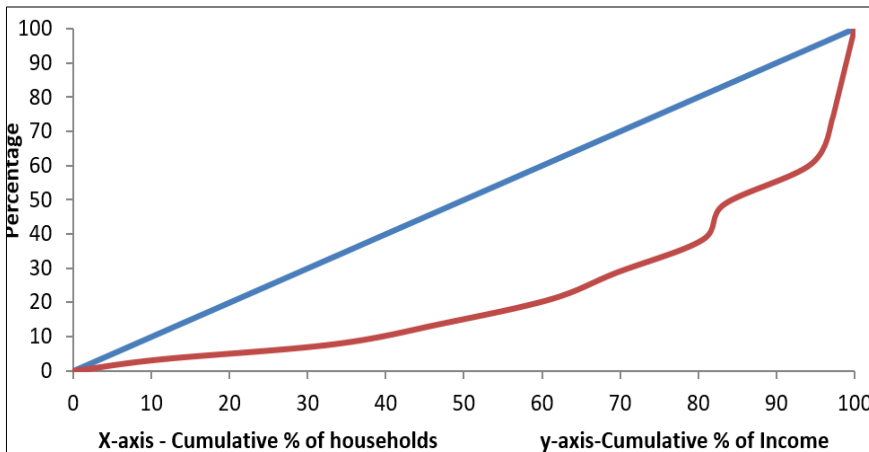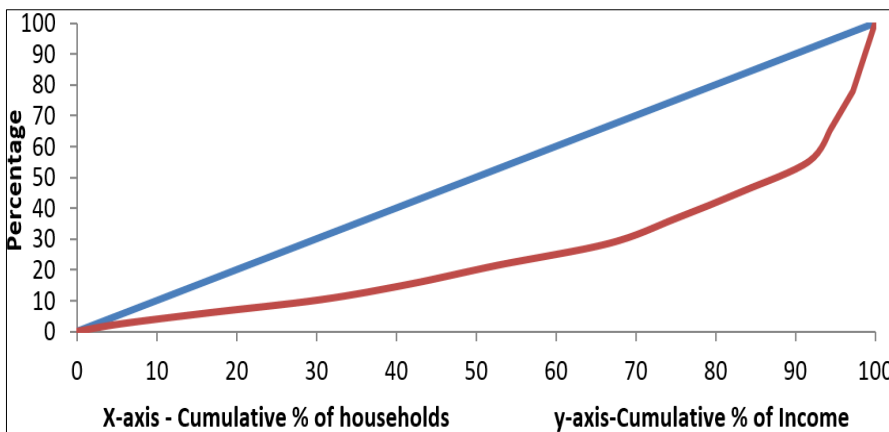
Fig 1(A)

Fig 2(B)

Fig 1(A, B, C): Lorenz curve during first, second and third years

Table 7: Quantification of measure of distribution of income

	1st Year	2nd Year	3rd Year
GCR	0.5765	0.5455	0.4987

Conclusion
The results revealed that the RKVY scheme had a positive impact on the income levels of sheep rearers thus reduced the inequality with regard to income levels as time progressed. From the study it could be concluded that sheep farming with technical intervention in the form of superior inputs could lead to reducing the income inequality.

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