

# **Coping Strategy during Farm Distress: a Case Study of Cattle Breed Improvement Program in Andhra Pradesh**

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## **Abstract**

*The income of the farmers can be improved if other enterprises are taken up by the farmer along with crop husbandry in an integrated manner, as they provide supplementary income to the farmers. This article aims to showcase the importance of the dairy enterprise, through breed improvement interventions, in increasing the farmers' income by taking a case study of the Cattle Breed Improvement Program of JK Trust. An evaluation of the Cattle Breed Improvement Program (CBIP) was carried out with the help of primary data collected from 240 farmer beneficiaries from 20 villages in four districts. It was observed that the program created awareness among farmers towards the benefits of an improved breed over non-descript cattle. The availability of doorstep services could be seen as a model initiative carried out by J.K. Trust. Increase in employment in terms of man days and increased income of the farmers due to breed improvement interventions are noteworthy.*

*The study suggests that in the event of crop failure, the income of the farmers could be protected by other enterprises such as dairy and more so with the breed improvement interventions. There is an urgent need to spread the National Project for Cattle and Buffalo Breeding (NPCBB) breed improvement program in areas which are not covered to address the farm distress.*

**Key words:** cattle breed, dairy enterprise, coping strategy, farm distress

## **Introduction**

India has been facing the problem of farm distress for many years owing to the large dependence of farmers on the cultivation of crops alone. However, policy makers have advocated that the income of the farmers can be improved if other enterprises are taken by the farmer along with crop husbandry in an integrated manner as they would provide supplementary income to the farmers in the event of crop failure.

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This article depicts the importance of the dairy enterprise through breed improvement interventions in increasing the farmers' income through an evaluation study of the Cattle Breed Improvement Program of JK Trust carried out by the National Institute of Agricultural Extension Management (MANAGE).

In India genetic improvement of cattle has been sought as a means to bring about improvement in milk yield in cattle. Genetic improvement is a long-term activity requiring sustained efforts. The Government of India has initiated a major program, "National Project for Cattle and Buffalo Breeding" (NPCBB) from October 2000. The Cattle Breed Improvement Program (CBIP) is a flagship program of J. K. Trust's Gram Vikas Yojana<sup>3</sup> which was implemented as a part of NCPBB. The main objective of this program is to upgrade/crossbreed the local indigenous low milk yielding cows and buffaloes by breeding through Artificial Insemination (AI) with the use of high pedigree frozen semen of indigenous/ exotic breeds.

### **Modalities of Implementing CBIP**

One Integrated Livestock Development (ILD) centre covers approximately 8-10 villages falling within an area of 5 - 8 Kms from its location. The number of centers established depends on the size of the block. One program operator, called 'Gopal' is posted at each of these centers. The program operator is trained by qualified Veterinarians, for four months, to carry out Artificial Insemination in cows/ buffaloes and other allied veterinary services like better livestock management practices. The program operator is provided with a motorcycle to perform AI and provide other minor veterinary services at the doorstep of the farmers. To ensure the success of this program, mass castration camps are organized in all the villages to castrate the local stray bulls in order to avoid indiscriminate breeding of the local variety. The work of these program operators is supervised and monitored by trained supervisors called Rural Development Officers (RDO). One RDO monitors the work of around 10 ILD centers. Qualified veterinarians are appointed to provide technical support and supervision to the CBIP. Meetings of farmers from various villages are conducted through these centers on a regular basis to enlighten them about the advantages of upgrading and crossbreeding.

This paper aims at impact assessment of the Project "Cattle Breed Improvement Program" implemented by J.K. Trust Gram Vikas Yojana in the state of Andhra Pradesh. The specific objectives are as follows:

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<sup>3</sup>Gram Vikas Yojana is an intervention project carried out by JK Trust in Andhra Pradesh. MANAGE has conducted an evaluation study for JK Trust interventions in cattle breed improvement program.

1. To measure the extent of increase in improved cattle and buffalo breeds (change in herd composition) in the project area due to CBIP interventions.
2. To measure the extent of penetration of AI services in cows and buffalos to the door step of the farmers in the project area.
3. To measure the awareness of farmers with respect to AI services provided by J.K. Trust.
4. To evaluate the quality of services (viz. AI, first aid veterinary services, vaccination, de-worming, de-ticking, castration of scrub bulls, fodder development, extension meetings etc.) provided under CBIP
5. To measure the extent of improvement in Livestock management and knowledge up gradation with respect to nutrition, diseases management and milk production among farmers due to CBIP Interventions.
6. To measure the impact of CBIP on Income of households and living standards.
7. To measure the impact of CBIP on employment generation.
8. To measure the sustainability of the project interventions.

The article is written with focus on those interventions of CBIP which have bearing on income and employment of the farmers.

### **Methodology**

To measure the CBIP interventions, both primary and secondary data were collected. Multiple level structured and unstructured schedules were designed for collecting the primary data pertaining to the beneficiaries. Information was also collected through focused group discussions, interviews with Gopals. The data for the present study was collected from the first week of June to mid July, 2012.

### **Sample Design**

Out of eight districts, where the program was implemented, four districts were selected purposively covering all the regions. The districts selected were Adilabad, Kadapa, Prakasam and Medak. From these districts, 20 villages were chosen at random and again from these 20 villages, 240 farmer beneficiaries were selected at the rate of 12 farmers per village. Data was collected from 20 Gopals. Twenty focused group discussions were held in selected villages for collecting information pertaining to the beneficiaries.

## Evaluation, Results and Discussion

### *Socio economic Profile of Sample Respondents*

The majority of farmers who were part of the study belonged to general category (67.5%) and OBC (23.8%). The average family size was found to be 5 with a minimum of 3 members to maximum 14 members. The average age of the farmer was found to be 44 with a range between 19 and 65 years. Sixty nine per cent of the farmers were found to be literate. The highest literacy rate was observed in Medak and Prakasam districts and the least in Adilabad. Only 8.4 per cent farmers were graduates and above (Tables 1 & 2).

The study reveals that 87.6 per cent of farmers who were surveyed, have livestock as a secondary source of their earnings. The average sample land holding size was estimated at 4.25 acres for all the sample beneficiaries. The land holding size is approximately five, three, five and four acres in Adilabad, Kadapa, Medak and Prakasam respectively.

**Table 1. Social Profile of the Sample Respondents**

District	Social Group				Total	Avg Family size	Avg Age	Literacy (%)
	Gen	OBC	SC	ST				
Adilabad	34 (40.5)	31 (36.9)	15 (17.9)	4 (4.8)	84 (100)	5	42	55
Kadapa	49 (81.7)	10 (16.7)	1 (1.7)	0	60 (100.0)	5	47	70
Medak	22 (61.1)	13 (36.1)	1 (2.8)	0	36 (100.0)	5	43	83
Prakasam	57 (95.0)	3 (5.0)	0	0	60 (100.0)	4	45	80
<b>Grand Total</b>	<b>162 (67.5)</b>	<b>57 (23.8)</b>	<b>17 (7.1)</b>	<b>4 (1.7)</b>	<b>240 (100.0)</b>	<b>5</b>	<b>44</b>	<b>69</b>

*Figures in parentheses are percentages*

**Table 2. Educational Qualifications in the Sample Districts of Andhra Pradesh**

Educational Qualification	Number	Percentage
Not Literate	74	34.1
Functional Literacy	12	5.0
Primary Education	21	8.8
Upper Primary Education	41	17.2
High School	47	19.7
Intermediate	23	9.7
Graduate	15	6.3
Graduate & Above	5	2.1
<b>Total</b>	<b>238</b>	<b>100</b>

### ***Evaluation of CBIP Interventions***

The majority of the sample farmers have received AI services from CBIP since the last three years. In Medak and Prakasam, though the utilization was very low in the beginning, within three years of the interventions, it picked up pace i.e. the majority of the farmers started availing CBIP services. The awareness levels of CBIP interventions through Gopal were found to be very high, which indicates that Gopals were very active in creating awareness (Table 3).

**Table 3. Effectiveness of CBIP Services**

<b>District</b>	<b>Level of Awareness of CBIP Services (%)</b>	<b>Utilization of CBIP Services 4-5 years back (%)</b>	<b>Improvement in cattle breed due to CBIP Interventions (%)</b>
Adilabad	90.5	43	99
Kadapa	85.5	52	100
Medak	77.8	14	94
Prakasam	98.3	13	98

The herd composition changed positively due to the interventions. The herd composition constituted sixty five per cent of animals and 95 per cent of the young population of improved breed, indicating a substantial change in the quality of animals in the project area. It was observed that 31.0 per cent in Adilabad district, 48.3 per cent in Kadapa district, 55.6 per cent in Medak district and 38.3 per cent of farmers in Prakasham district had Milch animals born out of CBIP interventions by JK Trust (Table 4). It is a well known fact that genetic improvement in cattle is a long drawn out process. The success rate observed is an achievement and the change had been brought about within a short period of the project.

**Table 4. Distribution of Milch Buffaloes of Improved Breed with CBIP Intervention**

<b>District</b>	<b>At present do you have Milch Cow of Hybrid Breed with CBIP Intervention</b>			<b>Do you think the progenies born out of CBIP are of better type</b>		
	<b>Yes</b>	<b>No</b>	<b>Total</b>	<b>Yes</b>	<b>No</b>	<b>Total</b>
Adilabad	26 (31)	58 (69)	84 (100)	84 (100.0)	0	84(100)
Kadapa	29 (48)	31 (52)	60 (100)	60 (100.0)	0	60 (100)
Medak	20 (56)	16 (44)	36 (100)	34 (94.4)	2 (5.6)	36 (100)
Prakasham	23 (38)	37 (62)	60 (100)	60 (100.0)	0	60 (100)
<b>Total</b>	<b>98 (41)</b>	<b>142 (59)</b>	<b>240 (100)</b>	<b>238</b>	<b>2</b>	<b>240</b>

*Figures in parentheses are percentages*

Table 5 shows the perception of farmers about the quality of progenies born out of CBIP interventions. All the farmers (100%) in Adilabad, Kadapa and Prakasam districts and 94.4 per cent of farmers in Medak district, perceived progenies born out of CBIP as better. The Hybrid animals have the capacity to give high milk yield and they start giving milk at an early age as compared to indigenous breed. At the same time, it was observed that, the calves were very sensitive and die if proper care is not taken.

Table 5 shows the data regarding the ownership of F1 (First generation) and F2 (Second generation) animals born out of CBIP Interventions. Around 52.5 per cent of total respondent farmers were owners of F1 and F2 animals. Medak had maximum owners of F2 animals (61.1%), followed by Kadapa (58.3%), Prakasham (55%) and Adilabad (42.85%).

**Table 5. Impact of CBIP Interventions**

District	Family as a owner of F1 or F2			In case you are paying, the charges for the above services (you consider) are			
	F1 only	F1 and F2	Total	High	Adequate	Subsidized	Total
Adilabad	48 (57.1)	36 (42.85)	84 (100)	0	10 (11.9)	74 (88.1)	84 (100.0)
Kadapa	25 (41.7)	35 (58.3)	60 (100)	0	16 (26.7)	44 (73.3)	60 (100.0)
Medak	14 (38.9)	22 (61.1)	36 (100)	0	17 (47.2)	19 (52.8)	36 (100.0)
Prakasham	27 (45)	33 (55)	60 (100)	1	24 (1.7)	35 (40.0)	60 (58.3)
<b>Total</b>	<b>114</b> <b>(47.5)</b>	<b>126</b> <b>(52.5)</b>	<b>240</b>	<b>1</b> <b>(0.4)</b>	<b>67</b> <b>(27.9)</b>	<b>172</b> <b>(71.7)</b>	<b>240</b> <b>(100.0)</b>

*Figures in parentheses are percentages*

In order to measure the willingness of farmers to pay for the CBIP services, post JK trust interventions, the present study included a question in the schedule for beneficiaries. The data reveals that the majority i.e. (98.8%) respondents in Adilabad district, 100 per cent in Kadapa district, 94.4 per cent in Medak district and 98.3 per cent in Prakasam district expressed willingness to pay for CBIP services in the future after the completion of the project. This suggests that the CBIP program has a commercial viability and moving towards achieving sustainability in these districts (Table 6).

**Table 6. Willingness to pay for CBIP services in the Future**

District	Whether you will be willing to pay for the above services in future		Total
	Yes	No	
Adilabad	83 (98.8)	1 (1.2)	84 (100.0)
Kadapa	60 (100)	0	60 (100.0)
Medak	34 (94.4)	2 (5.6)	36 (100.0)
Prakasham	59 (98.3)	1 (1.7)	60 (100.0)
<b>Total</b>	<b>236 (98.3)</b>	<b>4 (1.7)</b>	<b>240 (100.0)</b>

*Figures in parentheses are percentages*

The average additional annual income per family accrued due to CBIP Interventions during the last three years, was worked out to be Rs. 7,646. It amounts to 11 per cent increase in the total annual family income in the project areas. It may be noted that this increase is only from the increase in milk income and does not include income from sale of male-calf, manure and draft value, etc.<sup>4</sup>. The total value of additional milk produced by the improved progeny is estimated at Rs. 195 crores, over the last 3 years. Thus, the average additional gross income per family per year in A.P due to CBIP interventions is Rs. 7646/- (Table 7).

**Table 7. Impact of CBIP on Income of Households**

Description	Year-1	Year-2	Year-3	Year-4	Year-5	Projected Yr 6
Female-Calves Produced	1875	12379	22464	31804	38902	54829
(Adj. For mortality @ 10%)	1688	11141	20218	28624	35012	49346
Expected in Milk (F1)	-	-	1114	7732	15844	23428
Expected next calving	-	-	-	735	5353	12192
	-	-	-	-	485	3698
	-	-	-	-	-	320
Total number of Improved Animals -Expected in Milk			1114	8467	21682	39639
Total Female Progenies produced during the Project						162253
No. of Calving from Progenies produced						70901
Av. Addl. Production per Lactation*						1400
Less 300 litres per lactation of Parent Animal						1100
Total Addl. Milk Production (in Litres in crores)						14.46
Total Value of Incremental Milk (in Rs. In crores)						38.99
Per family Incremental Income (in Rs.)						22938
Per family Incremental Income/ per year (in Rs.), over last 3 years						7646
Total Value of additional milk produced by improved progeny over last 3 years (Rs. 195 in Crores)						

\* This is weighted average production of improved Buffaloes and Cows

<sup>4</sup>The reported milk production of improved cattle and buffaloes is around 1300 to 1500 litres per lactation (this is to be indicated that 82 per cent of the total stock is buffaloes and remaining are Ongole and crossbred in the study area). After adjusting for the milk production by ND buffaloes and cattle, the average incremental milk production by the improved progenies is 1100 Litres (1400 litre - 300 litre, per lactation of 300 days).

If the project would have been extended for a further period of 5 years, the average gross income per family would have been increased by Rs. 18,240/-. It would be over 20 per cent of total family income, making dairying as one of the key and stable income generating activities of the family. The extended project would also create net additional animal wealth worth Rs. 95,078/- per family. This would further contribute to the project to take deeper roots thereby enhancing the sustainability of the project.

The study reveals that 82 per cent of the total improved progeny is buffaloes and 18 per cent Ongole and crossbred. Focus group discussions (FGDs) indicated that the additional average value of the Buffalo-heifer is Rs. 20000 (discounting Rs. 5000 for the local breed), buffalo-male calf Rs. 1000/-, for Ongole heifer the additional average value is Rs. 12,000 (discounting Rs. 3000 for the local breed) and for the male-Ongole calf is Rs. 10,000 (discounting Rs. 5000 for the local breed). The total number of calves born during the project period is 3,24,506 (male and female both). The net additional value of this stock works out to Rs. 344 Crores. Thus, on an average, for each family, an additional livestock wealth worth Rs. 40,429 has been added due to project interventions (Tables 8 & 9).

**Table 8. Projected Per Year Additional Family Income due to CBIP in AP for a 10-Year CBIP Project**

Description	
Female Progenies likely to be Produced during the Project (number)	381569
No. of Calving from Progenies produced: (number)	451013
Av. Addl. Production per Lactation (Litres)	1400
Less 300 Litres per lactation of Parent Animal (Litres)	1100
Total Addl. Milk Production (Litres in crores)	4.96
Total Value of Incremental Milk (Rupees in crores)	124.03
Per family Incremental Income, in 8 years (Rupees)	1,45,916
Per family Incremental Income/ per year (Rupees)	18,240

**Table 9. Asset Creation due to CBIP**

Description	
Total calves born (number)	324506
Female calves born (number)	162253
Value of milk produced (Rs. In crores)	390
Asset Value of female stock (Rs In crores)	301
Asset value of male stock (Million Rs)	425
Total assets created - male + female (Rs. In crores)	344
Incremental assets and milk value for all calves born (Million Rs)	7336
Asset and milk value created per calf - for females only (Rs)	42594
Asset and milk value created per Rs.1000/- of investment	20960

The project interventions have generated an additional employment to the extent of 53 lakh person days over the last 5 years for managing the improved progenies at the farm level. This is based on the studies of Patil & Udo<sup>1\*</sup> (1997) which reported 15 additional person days per year for every improved animal. This works out to 62 additional person days per family in the project area. No separate additional employment has been considered for the male progenies, as they are generally disposed off at an early age. In addition, direct full-time employment has been provided for 291 local rural youth, who have been trained and deployed as Gopals of ILDC (Integrated Livestock Development Centre) during the project period (table 10).

**Table 10. Employment Generation due to CBIP and Cost Benefit Ratio**

Description	
Project period	5 years
Project investment (Rs.in crores)	35
Additional man-days created at farmers level in the project period (number in lakhs)	5.3
Value of total man-days in the project period (Million Rs)	735
No. of Gopals employed	291
Income to Gopals through direct employment (Rs. In crores)	1.05
Total employment benefits - Gopals + farmers (Rs. In crores)	84
Value of additional employment generated per Rs.1000/- of investment	2399
Total value of assets, milk and additional employment generated (Rs. in crores)	817.6
Cost Benefit Ratio for the project	1: 23.4

The CBIP project has resulted in the creation of net additional livestock wealth of Rs. 344 crores, in addition to the net additional income of Rs. 390 crores from the additional milk produced. Further additional employment worth Rs. 84 crores has been generated in the project area. With Rs. 35 crores as an investment over a five-year period, the project areas have benefited to the tune of Rs. 817.6 crores. Thus, the cost-benefit ratio works out to 1:23.4, excluding intangible benefits like better knowledge and awareness, more employment opportunities, improved livestock management practices and possibly improved family nutrition.

## Conclusion

CBIP interventions led to increased employment in terms of man days and increased income of the farmers due to breed improvement interventions. Making dairying as one of the key and stable income generating activities of the family was possible by creating awareness among farmers towards the benefits of improved

<sup>1\*</sup>Patil B.R., Udo H.M. J. (1997) *The Impact of Crossbred Cows at Farm Level in Mixed Farming Systems in Gujarat, India*, Asian-Australasian Journal of Animal Science, Vol 10 (no. 6) 621-628, 1997.

breed over ND cattle and by providing AI services of J.K. Trust. In the context of farm distress being reported from several parts of the country, sustaining farmers' income through supplementary activities like milk production assumes greater significance. There is an urgent need to spread the NPCBB breed improvement programmes to address the farm distress.

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