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# Approach to livelihood in desert area of Rajasthan through cattle development

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ABSTRACT

An area of 5 Cattle Development Centres (CDC) covering 1690 beneficiaries in Parbatsar, Riyabadi and Mertacity tahsils of Nagour district of Rajasthan were selected to undertake the project from 2008–2011. The project activities involved artificial insemination at the door-step of farmers using frozen semen of Tharparkar breed bulls, establishing demonstration of silvi-pasture on community land, training programme for cattle owners regarding improved animal management practices and monitoring progeny growth for impact assessment. To demonstrate the concept of silvi-pasture a model of 1ha was developed and available fodder sold on auction basis and animal owners appreciated the efforts. Basline survey results indicated that 33.49% animals were non descript and 0.17% population had Tharparkar breeds. These animals were targeted to produce improved progeny by breeding through use of semen from Tharparkar breed bulls (dam's milk yield 2600 to 2975 kg) which were selected and procured from Central Cattle Breeding Farm, Suratgarh (Ganganagar). Average body weight at 3 months was 46.96±1.49 kg and 43.51±0.88 kg for males and females, respectively. Body weight at 6–, 9 -, 12 -, 15 - and 18-months was 81.64±7.37, 102.02±8.37, 111.23±7.52, 136.99±11.35, 155.11±15.07 kg, respectively, for males and 73.06±3.98, 94.02±7.47, 100.03±4.36, 121.94±5.86, 149.59±5.60 kg, respectively for females. The female progenies got pregnant during this project period at 20 months and another at 21 months of her age. These achievements could be attributed to the efforts of farmers and project staff through training and personal visits to door step.

**Key words**: Body weight, Desert area, Rajasthan, Silvi-pasture, Tharparkar

Indigenous cattle is known to efficiently convert farm crops, byproducts and pasture fodder to milk and milk products, which forms animal protein in the vegetarian diet, besides providing manure for maintaining soil fertility. Families in desert areas solely depend on rainfed conditions since agriculture does not keep them busy round the year. Cattle rearing is considered as an insurance against droughts and hence is adopted as a source of livelihood. Tharparkar cattle breed has its home tract in desert due to which it is specifically selected by farming community for high milk production and milk fat %. They have capacity to survive and produce in the hot climatic conditions to the extent of 80–90% (Kaushik and Mudgal 1992) thriving on locally available un-conventional feeds. An attempt was made to motivate desert cattle owners to adopt artificial insemination and create awareness about improved management practices.

## MATERIAL AND METHODS

An area of 5 clusters (Cattle Development Centres -CDC) each covering 30 villages in Parbatsar, Riyabadi and Mertacity tahsils of Nagour district of Rajasthan (situated between 260.25" and 270.40" North Latitude and 730.10" and 750.15" East Longitude) were selected for implementation of Artificial Insemination activities during 2008 to 2011 under Department of Biotechnology Project. The major activity involved undertaking artificial insemination at the door step of farmers using frozen semen of selected Tharparkar bulls for which 5 Tharparkar bull calves (dam's milk yield 2600 to 2975 kg) were selected from Central Cattle Breeding Farm, Suratgarh in Ganganagar. After completing disease testing and confirming free from contagious diseases, they were procured and quarantined for 60 days. Post-quarantine period all bull calves were individually housed and body weight was recorded on monthly basis till the age of semen collection. Bull calves of 350 kg average body weight were made to donate semen, and the semen of bull calves was collected once in a week. Semen samples were evaluated for quality standards and the bulls were permitted for regular semen collection only after fulfilling these standards. Training programme for cattle owners was arranged to create awareness regarding improved management practices. One hectare silvi-pasture unit was developed on community land to demonstrate the concept and the progenies growth was

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monitored through physical body measurements on quarterly basis. The data so generated were compiled and analyzed using standard statistical procedures.

## RESULTS AND DISCUSSION

Base-line survey covering 1320 families indicated that 85.80%livestock owners were above poverty line while remaining (14.20%) were below poverty line. In the study area, 18.48% animal owners had primary education, followed by 29.25% secondary and 31.97% college and above level of education. The % of illiterate was 20.30. The buffalo rearing farmers were more (48.61%) followed by non descript cattle (33.49%), Nagour breed (14.70%) and Tharparkar breed (0.17%) rearers. The contribution of crossbred (*Bos taurus* × *Bos indicus*) cattle was 2.83%. For artificial insemination implementation purposes, 33.49% non descript along with Tharparkar breed population (0.17%) in the operational area were targeted and tried to breed by using semen from Tharparkar breed to produce improved progeny. The land use pattern indicated that 95% famers did not devote land for fodder cultivation, farmers those having assured irrigation facility cultivated fodder like lucerne and maize.

*Management practices*

Calves feeding by suckling till 4 months of age and offering readymade concentrate to pregnant and lactating animals were found to be the major management practices. The sale and purchase of livestock was done through fair and weekly markets chiefly by male members of the family. Regarding aftercare of calved animals, 47.57% farmers responded that they wait till placenta was expelled normally, 30.76% farmers waited up to 3 h and then called the veterinarian for help while remaining 21.67% farmers did not respond to the query. All the farmers reared livestock for milk, draught and manure purpose in the study area. Dried leaves of *khejri* trees (*Prosophis sineraria*) locally known as *Laun* mixed with wheat *bhusa* was used as animal feed during summer. The proximate analysis of *khejri* leaves revealed that it contains 94.51% dry matter, 15.44% crude protein, 22.82% crude fibre, 1.11% ether extract, 6.65% ash and 1.61% silica.

*Breeding services*

Majority of the farmers in study area lived in *Dhani* (a small hamlet) which were generally away from main village panchayats where all the day to day activities were performed. The women folk looked after care and management of animals and pursued *Parda* system *(Ghunghat)* as a part of their society tradition. Since the animals in heat were ferocious, farmers were reluctant to take animals in heat to veterinary hospital for artificial insemination. Considering these factors, door step breeding services were provided to beneficiaries and during the project period and 2508 artificial inseminations were carried out and of which 1197 pregnancies were recorded with 53.53% conception rate. Total 502 births were recorded (259 males and 243 females). It was also noticed that 261 animals were discontinued due to sale, transfer and death.

*Progeny growth monitoring and impact*

The body measurements of 281 progenies taken on quarterly basis up to 18 months of age indicated that average body weight at 3 months was 46.96±1.49 kg for males and 43.51±0.88 kg for females. Further, the body weight at 6 -, 9-, 12 -, 15 - and 18-month was 81.64±7.37, 102.02±8.37, 111.23±7.52, 136.99±11.35, 155.11±15.07 kg, respectively, for males and 73.06±3.98, 94.02±7.47, 100.03±4.36, 121.94±5.86, 149.59±5.60 kg, respectively, for females. Male calves grew faster than females and attained more body weight compared to females. The progeny growth monitoring results revealed that 2 female progenies got pregnant during this project period. One progeny conceived at 20 months and another at 21 months of their age. The farmers and project staff were attributable for these achievements through training and visit to the door step.

*Demonstration of silvi-pasture*

Since small or marginal farmers prioritized food crops rather than forage crops, common village grazing and state-owned forest lands were often important source of forage. The standard package for silvi-pasture cultivation included constructing a boundary wall, and plant trees and grasses within the protected area. To demonstrate the concept of silvi-pasture, a model of one hectare was developed and available fodder was sold on auction basis. Livestock owners participated in this auction enthusiastically and appreciated the efforts. During the final phase of project, whole demonstration plot was handed over to Village Panchayat.

*Project beneficiaries*

Since inception of the project, 1690 beneficiaries availed the facility of artificial insemination, 862 beneficiaries got their animals pregnant through the project and 310 beneficiaries had progenies born from project bulls (male and female) of Tharparkar breed and 700 beneficiaries availed the facility of training.

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