

DECENTRALIZED SOLAR POWERED CAMEL MILK CHILLING CENTERS

Preserving quality of
Camel milk while
improving incomes
for dairy farmers

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CONTEXT & PROBLEM STATEMENT

- Camels in Rajasthan have historically enjoyed a high popularity and demand for heavy power work – transportation of goods, drawing of water from wells, sowing seeds, mill grinding, etc. These traditional functions have largely faded away, reducing economic viability of camel rearing across Rajasthan. This has led to a significant decline in the population of camels in the state.
- The absence of organized markets and know-how for sustainably integrating camel husbandry with the modern economy has greatly impacted the overall camel ecosystem. Over the years, a critical necessity to re-purpose camel value chains for newer opportunities & markets has emerged for enhancing livelihood options and growth for camel herders.
- Lack of infrastructure at camel milk collection centers to maintain the quality and shelf life of camel milk, before it is sent to processing centers.
- Lack of reliable grid electricity supply which is essential to store the milk in conventional chilling units has led to spoilage of milk at the centers.
- As a result of spoilage of milk, income of camel herders has been further impacted.
- The focus is to facilitate community-driven camel milk collection, infrastructure development and enterprise development priming amongst 1600 camel-herding households in Bikaner, Jodhpur and Jaisalmer districts of Rajasthan state which can be further replicated into global states which are geographically identical such as Ethiopia.





NEED FOR COOLING CAMEL MILK

One of the key activities in the dairy value chain that plays a critical role in keeping quality of milk intact is cooling of milk before it gets processed. Innovative and faster instant milk chilling technology that chills milk at shorter time would reduce spoilage, retain quality, and increase shelf life of the milk collected at the collection centres and hence thereby increase income of dairy farmers. Milk being a highly perishable product needs to be chilled to $\sim 4^{\circ}\text{C}$ at the earliest to arrest bacterial growth and retain its quality.

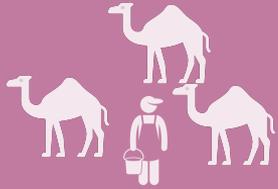
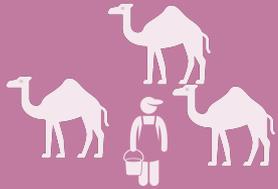
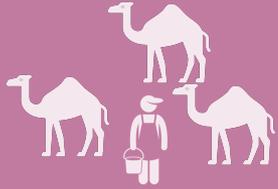
In Rajasthan, the scattered camel herders and farmers face challenges from the lack of local collection centers with appropriate cooling solutions. With just around 3 hrs of shelf life, camel milk would really benefit from decentralized cooling infrastructure. Thus, with the opportunities to decentralize cooling, especially powered by solar energy in these areas with abundant sunshine and unreliable electricity, SELCO Foundation has partnered with Urmul to strengthen smallholder camel farmers/dairy entrepreneurs by reducing the transaction costs and wastage of milk.

PROGRAM

The pilot intervention of solar powered instant milk chillers for Camel value chain in Bikaner, Rajasthan, would build evidence for replicable models of developing decentralized sustainable energy powered solutions for camel value chain across similar contexts in India and Sub Saharan Africa.

CHALLENGE : Previously farmers had to travel 150 - 200 km to the federation; Camel Milk has a short shelf-life of 3 hrs.

RESULT : Wastage of milk, thus losing income in the process



50km



Mini collection center with solar milk cooling solution

150 - 200 km



Milk Processing Center at Shri Balinath Uthpalak Federation

150 - 200 km

----- New Channel

----- Old Channel

SOLUTION: Decentralised small scale chilling units to reduce the transportation of milk for longer routes. Immediate cooling will help to retain the quality of the milk which was difficult when it need to travel for more than 200 km



PROGRAM COMPONENTS

SOLUTION: Solar Powered Instant Milk Chilling systems – To chill the milk at the source - thereby reducing spoilage, retaining quality, and increasing shelf life before it is transported to processing units.

OWNERSHIP : Individual Camel herders

FINANCIAL MODEL: Pre and Post cost leveraged by the partner Testing supported by SF

TECHNOLOGY: MilkoChill Instant Milk Chiller can chill 250 liters of milk instantly in one hour. The solution is based on a unique thermodynamic design. Keeping in mind the non-reliable electrical grid supply in remote villages, the system is designed with a thermal storage mechanism which stores energy whenever electricity is available. The system is connected with solar energy. This eliminates the need for diesel generator, or grid electricity, thus reducing operating costs.



PROPOSED IMPACT:

- The solution will serve the entire camel herder community of Nokh & Modardi Villages in Bajju & Jaisalmer districts respectively.
- On the whole there will be significant reduction in spoilage of milk collected at the milk collection centers at these villages
- This in turn will increase the income and interest of camel-herder community (both farmers & entrepreneurs) in the region to sustainably integrate camel husbandry to their livelihood

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