



Mobility: Buffalo Bicycles Impact on Dairy Farmer's Productivity

Executive Summary

Palabana Dairy Cooperative Research Study

March 2016



Productivity Results for Farmers with Buffalo Bicycles:

Number of deliveries increased up to **25%**

Volume of milk increased **23%**

Amount of income increased **23%**

Travel time to cooperative reduced **45%**

World Bicycle Relief's Palabana Dairy Cooperative Research Study has examined Buffalo Bicycle sales over a five-year period to measure their impact on dairy farmer productivity and quality of life.

The Need

In areas of the developing world where walking is the primary mode of transportation, people are often challenged to make a livelihood because of distance. Transport plays an essential role in market access and productivity.

The Opportunity

Many dairy farmers in Palabana, Zambia transport milk cans over long distances, which limits the number of deliveries they can make in a day and the volume of milk they can carry. Farmers traveling on foot or using unreliable bicycles are often late in making deliveries and the milk quality suffers as a result.

The Intervention

To help overcome these challenges, World Bicycle Relief and the Palabana Dairy Cooperative (PDC) partnered to sell high-quality, rugged Buffalo Bicycles, to dairy farmers in this rural community of 7,500.

From 2011 to 2014, dairy farmers bought 281 Buffalo Bicycles through the PDC's employee purchase program – a low-risk model that enables farmers to acquire a tool to increase their productivity and quality of life without any upfront capital. Payments for the bicycles are deducted from farmers' milk sales over a three-month period, and the PDC has maintained a 100% repayment rate to date. On average, cooperative members own two Buffalo Bicycles.

About Palabana Dairy Cooperative

Palabana, located in the Chongwe District of Zambia, is approximately 32 kilometers east of Lusaka, the capital.

The PDC, which was formed in 2000, has 80 active members, the majority of whom are smallholder farmers. The research study revealed that 74% of active members own fewer than 20 cows and 70% sell 30,000 liters or less milk to the cooperative annually. To reach the milk collection facility, dairy farmers travel distances of between 2 and 17 kilometers on rough, mostly unpaved roads. More than 40% live 6 kilometers or more from the cooperative.



Before farmers in Palabana had Buffalo Bicycles, many would transport their milk cans to the collection center on foot. It would take two people to carry one 30-liter can over long distances, and often the milk would spoil before reaching its destination. Other farmers used different bicycles that broke down often and had limited carrying capacity.

Research Findings

Monthly Milk Deliveries & Volume

	Farmers With Buffalo Bicycles	Farmers Without Buffalo Bicycles
Morning Deliveries	27 days	24 days
Afternoon Deliveries	25 days	20 days
Milk Volume	1,780 liters	1,449 liters

Additional Buffalo Bicycle Use By Farmer Families

32% travel to school

80% access health facilities

95% attend community gatherings

Research Study Methodology on back cover.

Influence of Buffalo Bicycles and PDC Growth

- Less milk spoilage and waste due to faster deliveries and fewer bicycle breakdowns
- Twofold increase in the average volume of milk sold by the cooperative to buyers from 2011 to 2014
- Up to 60 new members joined the PDC, boosting milk volume and providing increased revenue
- Tripling of cold storage capacity to 15,000 liters of milk in 2015, up from 5,000 liters.

The Impact

Using the Buffalo Bicycle, dairy farmers made more deliveries, transported more milk each trip, reduced spoilage and increased income, compared to farmers who walked or used inferior bikes and other transportation modes.

Milk Deliveries ↑

Because they can cover long distances in shorter periods, farmers with Buffalo Bicycles made up to 25% more deliveries per month than farmers without the bicycles. Having a Buffalo Bicycle means the farmer can reliably make up to two deliveries of milk per day with less spoilage.

Milk Volume ↑

Farmers with Buffalo Bicycles delivered 23% more milk than farmers without the bicycles. The Buffalo Bicycle's large-capacity rear rack and sturdy frame enable farmers to transport more milk than they could on foot or in a wheelbarrow.

Income ↑

Farmers with Buffalo Bicycles earned 23% more income per month than farmers without Buffalo Bicycles. Of the owners surveyed, 88% stated their incomes had increased due to the ability to transport higher volumes of milk. Farmers also reported saving money on bicycle repairs and maintenance.

Travel Time ↓

Farmers with Buffalo Bicycles reduced their travel time to the cooperative by 45%. For example, a trip of 55 minutes by foot was reduced to an average of 30 minutes with a Buffalo Bicycle. Farmers using other bicycle brands had frequent breakdowns, which resulted in delayed deliveries and milk spoilage.

Quality of Life ↑

Ninety-five percent of farmers interviewed use Buffalo Bicycles to better their lives. The bicycle gives family members access to education, healthcare and social networks such as friends, community centers and church.



For years, Georgina Stimbeke made only one milk delivery per day because she lives 12 kilometers from the Palabana Dairy Cooperative and had no good transportation options. Now she uses her Buffalo Bicycle to deliver milk twice a day and has increased her income.



Farmers can transport a greater volume of milk each trip on a Buffalo Bicycle because its sturdy rear rack can carry more than 200 lbs.



Most deliveries to the Palabana Dairy Cooperative are from smallholder farmers with five to twenty cows, producing milk every day for delivery to the collection center. Through its Buffalo Bicycle employee purchase program, the cooperative has recruited more members and increased its volume of milk sales.

Research Study Methodology

World Bicycle Relief conducted a research study on its multi-year relationship with the Palabana Dairy Cooperative. The purpose of the 2015 study was to evaluate the influence of Buffalo Bicycles on the farmers, the cooperative and the community. The study was a quasi-experimental design employing quantitative and qualitative research methods for data collection. Both cross-sectional and cohort data were used for descriptive and multivariate regression analysis of farmers and outcomes.

Quantitative Data

- Farmer milk sales (volume) to the cooperative
- Number of farmer deliveries (AM and PM)
- Bicycle sales by the cooperative
- Semi-structured household survey of 43 cooperative members

Qualitative Data

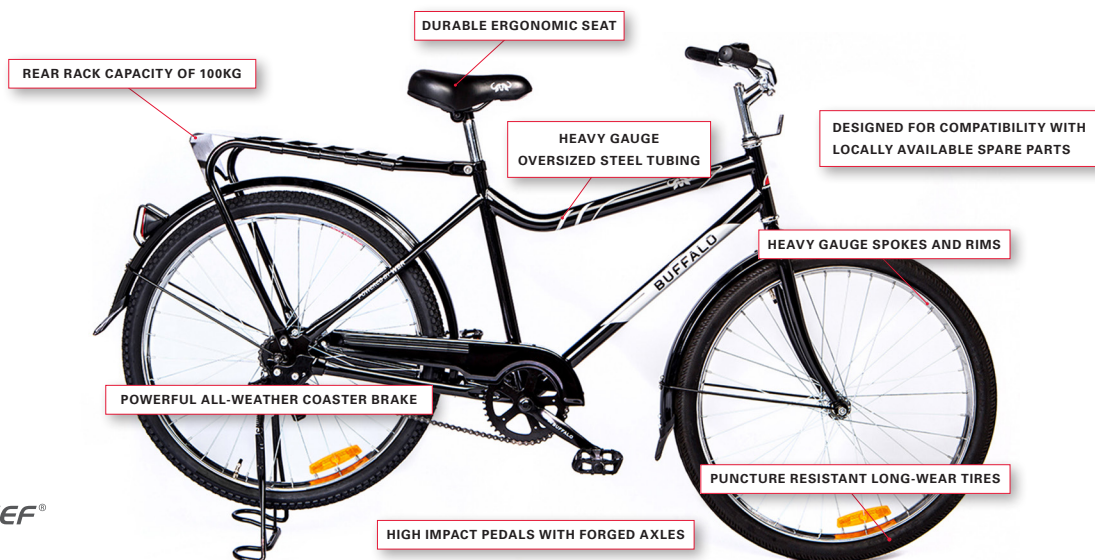
- Focus group discussion with dairy farmers
- In-depth interviews with PDC management

"I used to send my workers to take milk to the cooperative by foot. Later on, I bought some other bicycle, but since it was not strong enough, we experienced breakdowns every day and had to replace some parts quite often. This proved to be a big challenge so we decided to try the Buffalo Bicycle and we were happy with how it performed." – Dairy farmer in focus group discussion

Why World Bicycle Relief?

World Bicycle Relief mobilizes people through The Power of Bicycles. Our innovative model combines philanthropic distributions with social enterprise sales that enable us to achieve greater efficiencies of scale, distribute more bicycles per donor dollar and create deeper impact where we work.

We work closely with our partners, supporters and end-users to design and implement sustainable programs, leveraging best practices and local expertise. World Bicycle Relief oversees the philanthropic programs and its wholly owned subsidiary Buffalo Bicycles, Ltd. produces the bicycles that enable individuals to achieve mobility and thrive. We envision a world where distance is no longer a barrier to independence and livelihood.



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