

CIRF CASE STUDY 6

From Waste to Revenue: That's Bananas!

ZEAN LTD is a Rwandan banana chips and maize flour processor working with a large network of banana farmers across the region to reduce post-harvest losses through processing. Every production cycle generates three significant waste streams: banana peels in volumes of up to 900 kg per week; off-cuts and overheated bananas that do not meet the quality standard for chips; and 1,200+ liters of cooking oil discarded after just two or three uses.

The company had a clear ambition to do something with its waste, but lacked the technical knowledge to act on it. Replacing cooking oil twice per production cycle was costing ZEAN close to 3,000,000 RWF ($2,000 USD) per cycle. The banana peels and off-cuts had no identified market and were not systematically used.

SCOPING

CIRF provided ZEAN Ltd with technical assistance via Euro Ingredients, beginning with a comprehensive assessment of ZEAN's operations. The assessment mapped each waste stream across the production process: the volumes generated, how each was currently managed, and what market opportunities existed for repurposing them.

The findings identified three distinct circular resource loops: 1) off-cut and overheated bananas that could not be processed into chips had potential as bakery ingredients; 2) banana peels could be fermented into animal feed for pigs and chickens; 3) cooking oil could be extended through quality monitoring rather than time-based replacement.

IMPLEMENTING

Training covered the three resource loops identified in the scoping assessment. For cooking oil, Euro Ingredients supported introduction of a Testo quality-monitoring device, and the change was immediate. Oil for banana chips could be reused 6 times before any negative outcomes, cutting oil costs by 50%.

The banana by-product work required more thought. Initial attempts to incorporate off-cut bananas into bread were unsuccessful because the texture was too heavy. The team pivoted to doughnuts, and the marketing reception was positive.

For the banana peels, a trial fermentation process was developed to break down the lignin and cellulose content that had made raw peels difficult for animals to digest. The resulting feed was marketed to local pig and chicken farmers. The fermentation process, which initially took two to three weeks per batch, is still being optimized.

The training produced a shift that extended beyond the three resource loops. The production manager noted that staff across the bakery and animal feed sections had adopted a more resource-conscious approach, actively identifying opportunities to repurpose waste without being directed to do so.



IMPACT

CIRF conducted a portfolio-wide impact assessment shortly after ZEAN's technical assistance concluded. Revenue from new circular products reached $346 per month in April 2025, one month after TA concluded. By September, it had grown to $6,480 per month. In 2025, when banana chip production halted due to a machinery issue, the company was able to support itself with the bakery as a steady revenue stream. Through these improvements, four new employees have been hired.

