Rice Parboiling
Innovation Fund Investment into Rice Production

A Case Study
About MEDA

Since 1953, MEDA has been designing and implementing market-driven economic development programs that improve the welfare of millions of people around the world. As a leader in financial services and market development, MEDA collaboratively creates business solutions to poverty by working in partnership with the poor and the institutions that serve them.

Abstract

This report is one of two evaluative case studies focused on the EDGET Project, developed towards the end of the project to assess the changes and benefits of MEDA’s rice value chain interventions to learn from and strengthen them for future interventions. This report explores rice parboiling technology used to leverage rice production and value addition, especially for women.

About EDGET

Ethiopians Driving Growth, Entrepreneurship and Trade (EDGET) is a five-year value chain development project funded by Global Affairs Canada (GAC). The project was designed to increase incomes for 10,000 men and women farmers and textile entrepreneurs by facilitating access to growing markets, enhancing production techniques and appropriate technologies, and improving input supplies and affordable support services, including finance.

EDGET, which means ‘growth’ in the Amharic language, has been concentrated on integrating smallholder rice farmers and small-scale artisans into higher value markets through increased market linkages and enhanced productivity. As a result of the project, Ethiopian rice and textile entrepreneurs are producing high-quality products and reaching new and growing markets to drive growth and improve livelihoods.
Introduction

Ethiopians Driving Growth, Entrepreneurship and Trade (EDGET) is a five-year value chain development project funded by Global Affairs Canada (GAC). EDGET works primarily with rice farmers and weavers, as well as other market actors, to help them increase their incomes and livelihoods by linking them together for a stronger value chain. Strong, equitable market systems, with sustainable support from private businesses and local institutions is a critical outcome of the project. A component of this system is access to technology; MEDA hopes that both producers and processors become more profitable in their production and marketing of rice with more efficient technology. This report centers on one particular technology identified, a rice parboiler machine.

Over the life of the project, MEDA worked with 8,567 rice farmers and 51 rice processors (10F; 41M) in Amhara and Gura Ferda Regions of Ethiopia. MEDA facilitated access for ten processors and farmers to access electric rice parboiling machines through matching grants. In addition, 120 female farmers purchased, through a similar matching grant, an aluminum parboiling pan, a similar idea but smaller, simpler, and wood-fired. For the electric parboilers, MEDA brokered a public private partnership, working with a local manufacturer to develop the technology. The processors and farmers piloted, and then launched it with ten MEDA clients.

This report presents early findings on the parboiling technology and model that MEDA introduced, considering some of the business metrics already emerging, and makes recommendations for future programming. It is our intention to provide information that will be useful to research and practitioner communities interested in understanding how to facilitate positive changes for producers and other value chain actors through access to technology.

MEDA worked with 8567 rice farmers & 51 rice processors
Methodology

As the project comes to an end, it was necessary to document and explore the successes and challenges faced by processors in the rice value chain. This case study is an investigation delving into a particular intervention or model—parboiling.

A mixed methods approach was used—both qualitative and secondary quantitative data was gathered and analyzed. Field trips to Woreta and Guera Ferda in 2014 and 2015 were conducted to meet with farmers, processors, and field staff to collect the business records used in this case study. In-depth interviews were conducted with processors and field staff, and observations were made at business sites. Additionally, survey, focus group discussions, and monitoring data all contributed to this report as secondary data.

It should be noted that translation from English to Amharic or other regional dialects, and vice versa, may have impacted the nature and depth of questioning.
Parboiling Technology: 
*The Model*

**Background**

As a development partner employing business solutions to solving market problems, MEDA established an Innovation Fund as a project tool that would help demonstrate the value of investing in new technologies, materials, and processes that would improve the overall markets for rice. Through this fund, MEDA shared a portion of the initial costs of the innovations, and in some cases helped facilitate access to external finance for the business owner’s cost-share, lowering the barriers of entry and risk to the early adopters.

MEDA modeled the Innovation Fund based on the assumption that there are win-win opportunities and outcomes for all market actors in the rice value chain—including lead farmers, farmers, traders, processors, and end market actors. One such opportunity for the Innovation Fund was the introduction of parboiling technology.

Parboiling of rice includes partial boiling of rice in the husk, which requires a fairly simple process of soaking, steaming, and drying. Parboiling technology is low cost, and leaves more nutrients in the rice than the more refined polished rice.

**Parboiling Benefits**

1. **Nutritional benefits for the consumer.** The process drives nutrients from the bran to the endosperm, making parboiled white rice 80% nutritionally similar to brown rice.
2. **Increased income to the farmers,** through an increased selling price to the processor.
3. **Higher grain quality at market,** thus fetching a better price for the processors or wholesaler. Because the parboiled grain is harder, it remains whole during the milling process, thus maintaining a higher grade of rice.

*Figure 1. Parboiling process*
This process loosens the husk, transfers some of the oils and nutrients to the kernels, and then after drying can be de-husked and polished. Although these final steps of de-husking and polishing (removing the bran) can be done manually, doing so at any scale requires a processing machine, known as a mill. Many towns have millers with these machines who use them for processing a variety of different grains. When used for rice, the paddy rice passes through the mills rubber rollers that squeeze and pinch off the husk. Then, depending on the machine, a second pass may be used to further remove the bran.

As parboiling technology was new to Ethiopia, there were no local manufacturers or distributors with equipment available for purchase. Wood or charcoal fired clay pot steamers are sometimes used by farmers for parboiling their rice for their own consumption, but MEDA was looking for a market-conscious model. A larger electric-heated, steel parboiling steamer machine was identified as being most likely able to meet the standards of higher quality (and thus higher income potential for farmers) rice, but it was not locally available.

Figure 2. Parboiling machine is a pressurized steamer, 50 kilograms (kg) capacity and electric powered (second photo with the basket removed)

To fill this supply gap, MEDA staff worked with a local manufacturer Mulat Industrial Engineering, in collaboration with the industrial design team at Bahir Dar University, to design equipment appropriate for small commercial enterprises. An initial prototype machine was constructed out of steel in a cylindrical design using an electric burner to heat the water and produce steam. A perforated basket holds the rice just above the waterline, so that steam penetrates the rice. The early editions of the boilers had a capacity of 25 kg, but were later redesigned to the current model that is able to accommodate up to 50 kg of rice.

The initial water heating consumes considerable time and energy, often 2-3 hours for the first load of rice to parboil. However, once heated up, additional batches can be run continuously, by reusing the existing hot water and simply topping off in between the batches. When uninterrupted full power is available, one boiler can process up to five loads, or 250 kg, per day. In practice however, production is usually constrained by the limited amount of drying space once the rice is removed from the parboiler.

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1 Power in most rural areas is sporadic, so actual times for heat-up and total cycle are not always consistent from one day to another. This can be particularly harmful if total power is lost part way through the boiling process and not able to be completed in the same day.
MEDA negotiated the manufacturing of an initial batch of ten machines at a rate of Ethiopian Birr (ETB) 15,858 per unit (approximately $780 USD), of which 50% was paid by the MEDA Innovation Fund, and the remaining 50% by the operator client. There is little other capital investment required for parboiling, beyond a thin woven fabric cloth to dry the rice on the ground.

Although operators are generally satisfied with the performance of the existing design, it is still a relatively crude machine that is dependent on significant human interaction and judgment, in particular related to the timing of the process. The time varies depending on power, ambient temperature of the water and air, and sometimes the rice itself. Thus, rather than mechanical measurement of when the process is completed, most operators go by the smell and sense that they have developed from their experience with the machine.

**Piloting Parboiling Technology**

MEDA staff believed that the most appropriate clients to test parboiling were those already involved in the rice value chain as processors, rather than recruiting new businesses. Of these, the most logical operators would be small village-level processors who already own a basic processing equipment and have existing relationships with rice growers. Because of the limitations of these mills (including reliable power, quality equipment, etc.), most rice when processed, is reduced to broken kernels and sold at the lowest commodity pricing to brokers, and then sold loose by weight in local markets. Consumers cook the broken rice as is, or further grind into flour and blend with teff for making injera, a local staple. For these processors, parboiling promised a relatively low-cost way of value addition for the local market. The EDGET project trained 31.8% of target rice farmer clients on the parboiling technology, and demand for this technology is increasing. Marketing cooperatives, Village Savings and Loans Associations (VSLA), and champion farmers all see the income potential from parboiling.

Further, MEDA found that parboiling yields a greater output, only losing 25% of the paddy weight in processing as opposed to 35% in traditional milling.

Although processors were the primary candidates to integrate parboiling into their businesses, others emerged as well. Several industrious farmers looked at parboiling as a way to increase the value of their rice. In addition, some traders also saw opportunities to expand their business. Few traders have the processing mills, but they do have relationships with both farmers and processors, so would be able to incorporate the value addition step in between the two if they had the additional capability.

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2 Combining parboiled rice with simple heat-sealing equipment is all that is required to package the product into 1 kg bags, creating a quality product that can be sold in supermarkets at a premium.
Gender-Sensitive Technology

A second, more basic technology was developed to be more accessible to women, aluminum pans and firewood to heat the water. To increase the supply of parboiled rice to the market and reach the unmet demand for the product, the project distributed 120 aluminum parboiling pans to 120 female client farmers on a 70% cost sharing arrangement with the project.

The female farmers who received the aluminum parboiling pans also received training on the parboiling process and techniques. As a result, they were able to produce 3,868 kg of parboiled rice and then sold to two processors. The sales from parboiled rice helped each female farmer earn an additional income of ETB 220 (CAD 14) to ETB 320 (CAD 780) per 100 kg due to value addition and less breakage during de-hauling the parboiled paddy rice.

Figure 3. Female farmers learn how to parboil rice

Results and Discussion

The Business Case

Both the process of parboiling and domestic marketing of parboiled rice are relatively underdeveloped to Ethiopia. We were able to predict cost of production with relative level of certainty as we know the cost of equipment, production time and labor costs, and the demand for most food products, especially new forms of the product are more difficult to forecast. While demand for food generally is inelastic, specific foods are highly elastic, sensitive to price and substitute goods, and the income of buyers. Further, the amount of parboiled rice sold to date is a small fraction of the overall rice market, and as availability and supply increases, prices may decrease due to increased competition. Nonetheless, for this simplified business case, we make some general assumptions of market pricing, based on limited market survey data and exhibitions that MEDA and our clients participated in—and do not attempt to add a sensitivity analysis to pricing. If parboiled rice were to gain more significant market-share of the rice markets, then larger market players would enter with more sophisticated technology, requiring more sophisticated models for the business case.

3. At the current exchange rate of CAD 1 : ETB 15.8
4. MEDA clients have taken part in numerous exhibitions where attendees were able to sample and purchase the parboiled rice and give an opinion of it. Other market partners have gauged the willingness to pay under several market conditions, including retail markets.
5. This is not a business case for parboiling as a stand-alone business, but rather as a new product investment for the company.
The business case for the parboiling technology consists of two pillars. The first being the profitability for the parboiling value chain actor, which includes three business metrics: Net Profit, Simple Return on Investment, and Payback Period. The second pillar for this business case is increased farmer income for the producer.

**Business Case Pillars**

**Business Metrics: Processor Profitability**

While profitability of the parboiler is not the primary concern of MEDA or the project, the opportunity must be sufficiently attractive as an investment, if the parboilers are expected to continue to operate after their initial year of MEDA involvement. Savvy business persons will use their assets and capital to the maximum advantage. Unless an investment is more profitable than other options, the intervention is not the best use of their capital and they are unlikely to sustain the activity.

Here MEDA presents the case of Momina Mohammad, a client of EDGET since 2011. Through the help of MEDA, she was already actively involved in small-scale processing in the Bahir Dar region. She employs three people (1F; 2M) and buys her product from rice farmers and sells primarily to wholesalers. In addition to the parboiling machine, she also owns two processing machines used for de-husking and polishing the rice. As many of the buyers only started parboiling in 2015, the data for both cost and markets is self-reported. Ms. Mohammad was in part chosen because she maintained the best records for a full year of activity. Staff interviews with other market actors confirm similar costs and sales data.

We used three simple business metrics, or indicators, to determine processor profitability: net profit; simple return on investment, and payback period.

**Net Profit**

Net Profit is calculated as the processor’s bottom line, as stated as a percentage of sales, and all costs are accounted for in this metric.

As one of the early adopters, Ms. Mohammad started with one of the smaller 25 kg machines before moving up to the current 50 kg capacity model. MEDA helped link her initially to an Addis food company, Endoto Traders, who developed the Addis Rice brand and packaging. More recently, her strategy has shifted to serving more local markets in the Bahir Dar region working closely with a local distributor Bereket Rice.

Ms. Mohammad said that she is able to parboil a minimum of three to five 50 kg loads per day, yielding between 112 – 187 kg net (after 25% weight loss) product daily. Her current productivity bottleneck is drying the rice after parboiling, since this is open air-dried. Yet, even observing this bottleneck of 2-4 days to dry rice and only one location to do so, one could reasonably parboil two days each week without adding infrastructure.
Ms. Mohammad’s Net Profit was found to be ETB 18,125 (CAD 1,147) in her first year of adding parboiling to the business. She sold 4,350 kg of parboiled rice, much of this was sold in bulk to a distributor and 650 kg was sold directly to end markets.

Her revenues included the wholesale and retail parboiled rice sold, and costs included both fixed costs such as the actual parboiling machine, rental of a drying house, and variable costs such as rice, inputs, electricity, labour, etc. We calculated this through the costs and revenues presented in Table 1.

<table>
<thead>
<tr>
<th>Table 1. Fixed and variable costs of Ms. Mohammad’s parboiling operations</th>
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</thead>
<tbody>
<tr>
<td>Description</td>
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<tr>
<td>---------------</td>
</tr>
<tr>
<td>Fixed Costs</td>
</tr>
<tr>
<td>Parboiling machine depreciation</td>
</tr>
<tr>
<td>Small auxiliary equipment depreciation</td>
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<tr>
<td>Drying house rent</td>
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<tr>
<td>Variable Costs</td>
</tr>
<tr>
<td>Paddy rice</td>
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<tr>
<td>Weight loss</td>
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<tr>
<td>Net input costs</td>
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<tr>
<td>House rent</td>
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<tr>
<td>Milling services</td>
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<tr>
<td>Electrical consumption</td>
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<tr>
<td>Transport cost of paddy</td>
</tr>
<tr>
<td>Transport finished product</td>
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<tr>
<td>Labor rate per day</td>
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<tr>
<td>Labor – pre-processing</td>
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<tr>
<td>Labor – processing</td>
</tr>
<tr>
<td>Drying attention labor</td>
</tr>
<tr>
<td>Sorting/ grading</td>
</tr>
<tr>
<td>Packaging labor and material</td>
</tr>
</tbody>
</table>

Based on the above cost data, a simple model was created to estimate costs per kilogram at various productivity levels and price paid to the farmer for the paddy rice. These calculations were run for three different production scenarios:

1. a low estimate of only 500 kg/month;
2. mid-range of 1,000 kg/month; and
3. a high estimate of 1,500 kg/month. Given that Ms. Mohammad’s production last year was closest to the above low production cost model and her own accounting indicated a cost of ETB 10.51/kg (without including the equipment purchase depreciation, nor labor for the parboiling technician). For purposes of further case development, we use the above calculated cost per kg based on purchase price of ETB 12.73/kg under a low production scenario, understanding that as the business grows, unit costs will reduce and income will increase.

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6. Calculation – 15,858 ETB purchase price, MEDA Innovation Grant reduced cost to client by 50% to 7,929 ETB, divided by 24 months expected product life = 330 ETB per month

7. Using conservative estimate of 3 loads in one day. 150 kg times recover rate of .75 = 112 kg per day divided by 40 ETB labor rate = .36 ETB direct labor for the processing
Considering the business revenue from sales, Ms. Mohammad and her fellow processors self-report a sales price of between ETB 18-22/kg to retailers, depending on location and market, and between ETB 22-26 selling direct to retail shops. Rice farmer producers sell to wholesale distributors for ETB 16/kg, depending on the season, supply and demand.

Table 2. Net profit calculations for Ms. Mohammad’s parboiling operations

<table>
<thead>
<tr>
<th>Income</th>
<th>Units</th>
<th>Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wholesale Sales kg</td>
<td>3,700</td>
<td>ETB 16</td>
<td>ETB 59,200</td>
</tr>
<tr>
<td>Sales to Retailer kg</td>
<td>650</td>
<td>ETB 22</td>
<td>ETB 14,300</td>
</tr>
<tr>
<td>Total Income</td>
<td></td>
<td></td>
<td>ETB 73,500</td>
</tr>
</tbody>
</table>

| Expenses                |       |       |        |
| Low Production cost     | 4,350 | ETB 12.73| ETB 55,375 |
| Net Profit              |       |       | ETB 18,125 |

Ms. Mohammed’s Net Profit of ETB 18,125 (CAD 1,147) shows positive business growth, as opposed to Net Loss. Given this was her first year implementing and investing in this new technology, showing positive retained earnings, she should continue to see annual increase in earnings.

**Simple Return on Investment**

A second business metric used to measure Ms. Mohammad’s profitability is her simple Return on Investment (ROI), stated as percentage of profit over fixed investment costs. This is a standard performance measure to evaluate the efficiency of an investment.

We have calculated an annualized ROI of 234% for Ms. Mohammad’s parboiling business. This we can derive based on her Net Profit of ETB 18,125, and a sum of her three fixed investment costs (per annum) of ETB 7,740. This is extremely profitable, and is based on conservative estimates of production. However, this is dependent on a steady demand for product, something we expect, but is beyond the purview of this report. This demonstrates that Ms. Mohammad (and parboiling businesses) are getting a sufficient profit in relation to the amount of capital they have invested into the new parboiling equipment – 234% ROI demonstrates a very profitable and optimistic business opportunity.

Table 3. Return on investment of Ms. Mohammad’s parboiling operation

<table>
<thead>
<tr>
<th>Net Profit</th>
<th>ETB 18,125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Investment Costs</td>
<td>ETB 7,740</td>
</tr>
<tr>
<td>ROI</td>
<td>234%</td>
</tr>
</tbody>
</table>

**Payback Period**

The third and final business metric we use to measure parboiler profitability is Payback Period. This indicator is the length of time required to recover the cost of an investment.
Ms. Mohammad’s Payback Period was just over 5 months – which is favourable as it is a short length of time required to recover the cost of her investment. The electric parboiler initially cost ETB 15,858 (CAD 1,004), of which the MEDA Innovation Fund and Ms. Mohammad both covered 50%, or ETB 7,929 (CAD 502). We use her investment value for our calculation and set aside MEDA’s contribution.

This supposes that the technology will be viable for two years, and includes a low production estimate. If she is able to extend the machine’s life, she can delay purchasing a new one. Even if MEDA were not in a position to contribute with a matching grant with her next purchase, Ms. Mohammad now knows that it will take her less than a year (around 10.5 months) to pay off a technology that she can increase her earnings from.

### Table 4. Payback period for Ms. Mohammad’s parboiling operation

<table>
<thead>
<tr>
<th>Annual fixed costs</th>
<th>ETB 7,929</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Profit</td>
<td>ETB 18,125</td>
</tr>
<tr>
<td>Payback Period (annual)</td>
<td>44%</td>
</tr>
<tr>
<td>Months</td>
<td>5.2</td>
</tr>
</tbody>
</table>

Using Ms. Mohammad’s experience as an example of profit potential, parboiling appears to be a quite good investment, particularly for those who already have processing capability as it provides an additional way to add value to their products. Specifically, it allows them to produce higher grade, unbroken rice with relatively limited equipment and low capital investment. We see that Ms. Mohammad earned a significant profit during her first year based on the existing sales, which represented just a fraction of her total capacity. The model shows that marginal income increases with volume. This is important as it indicates that as the business grows, so too will the benefits to the business owner, ensuring market sustainability.

**Increased Farmer Income**

A second business pillar to underpin success of the parboiling technology is any increase in farmer income. Indeed on the rice value chain, EDGET’s ultimate outcome, or goal, was to raise the income and improve the livelihoods of 8,000 smallholder rice farmers through increased participation in productive value chains. Increasing access to technology, such as parboiling machines, helps producers become more active participants in a more productive value chain.

MEDA examined the changes in farmer income from the sales price of parboiled vs. standard, unprocessed paddy rice. The two measurements that we used include a) total grain purchased by processors, and b) additional income to farmers, are based on the limited data that we have, yet offer us a reasonable picture of this profitability.

Using an average of 1 hectare (ha) per farmer, producing at an average of 4,000 kg/ha, the total parboiling production from last year could have been produced by two farmers alone! This indicates that the bottleneck is certainly parboiling production,
and also perhaps the demand. It becomes clear then that the parboiling intervention thus far has been minimal, and to achieve any significant impact for the farmer client will require significant increases in scale, both maximizing the output of each parboiler to capacity, and increasing number of parboilers working. Thus, this business pillar forecasts the potential for farmer income increases.

With an increase in demand for parboiled rice, total grain purchased by processors from the farmers would increase. Not only that, but as the quality of the rice increases (unbroken grain, higher nutritional content), so does the price that farmers are able to ask for their product.

Extending this model to the 9 parboiling machines that have already been produced in Amhara Region, our existing Innovation Fund purchases could result in the following net gains for our farmers, as seen in Table 5. These forecasts assume processors buy rice at ETB 7/kg (2014 prices) and a 25% premium paid for that rice, as it must be cleaner and of higher grade.

Table 5. Parboiler forecasting income increase for farmers

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Number of parboilers</th>
<th>Grain Purchased (kg)</th>
<th>Total income to farmers (ETB)</th>
<th>Premium increase for farmers (ETB)</th>
<th>Farmer income from parboiling (ETB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1: Mohammad example:</td>
<td>9</td>
<td>9 x 5,800 = 52,200 kg</td>
<td>52,200 x 7 = 365,400</td>
<td>52,200 x 1.25 = 65,250</td>
<td>430,650</td>
</tr>
<tr>
<td>Scenario 2: Current potential</td>
<td>9</td>
<td>9 x 20,000 = 180,000 kg</td>
<td>180,000 x 7 = 1,260,000</td>
<td>180,000 x 1.25 = 225,000</td>
<td>1,485,000</td>
</tr>
<tr>
<td>Scenario 3: Current plus added drying</td>
<td>9</td>
<td>9 x 40,000 = 360,000 kg</td>
<td>360,000 x 7 = 2,520,000</td>
<td>360,000 x 1.25 = 450,000</td>
<td>2,970,000</td>
</tr>
</tbody>
</table>

It is clear that there is large potential for increase in farmer income, if farmers are ready and willing to supply quality rice to a fully operational parboiling processor. In Scenarios 2 and 3 (the latter includes the 9 parboilers and adds a dryer, speeding up the process), the potential for increase is substantial, as seen in Table 5.

The average rice farmer cultivates 1.03 ha of rice and on that area produces an average of 3,630 kg of rice. In Scenario 1, we can assume 14 farmers supply rice for the parboiler. Under the current situation in Scenario 2, we can hope that 50 farmers would be able to supply rice, make more money from that market, and receive the premium. Under Scenario 3, with full parboiling and drying operation, we calculate that 99 farmers could supply rice for a year of parboiling, and benefit from the income and premium top-up. These Scenarios give a 19% increase in income to farmers who supply parboilers with rice.

With the parboiling technology, additional income is unlocked for farmers, especially for women farmers, and in a more direct fashion. Female farmers, who might have less mobility and need to stay home to manage the household and children, can readily attend to the parboiling process. In focus groups, MEDA found that 82% of VSLAs intend to purchase a 50 kg electric parboiler and hire their wives to manage parboiling, thus adding value to their rice.

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9. ETB 7 per kg.
10. Farmers pay a 25% premium, indicated here with 1.25.
Challenges

Parboiled rice is still a very new application in Ethiopia, and very small in relation to the overall production and markets for rice. The early adopters described in this report face the following parboiling production challenges.

**Technology**

The 25 kg and 50 kg pots have heating and consistency issues, both of which risk the quality and quantity of the parboiled rice. The quality of rice that the processors sell is thus varied, and it is difficult to predict the supply due to a variety of reasons. This causes other market actors to refrain from investing in the process.

**Energy Irregularities**

Electric parboiling requires power, which to date has not been reliable in rural areas and peri-urban project areas. The parboiling process takes a couple hours, sometimes longer, and if this is interrupted, the quality of the parboiled rice is in jeopardy.

For the woman farmers using the wood-fired parboilers, this is an expensive endeavor with the time and/or cash needed to seek firewood or purchase charcoal.

**Drying**

To date, drying rice after parboiling is a bottleneck. Both farmers and processors air dry their product, a process that can take between 2-4 days, either in a drying room or on a tarpaulin.

**Scaling**

Even if production and power were readily available, and a faster or better drying technique available, an unknown variable to the profitability of parboiling remains how to scale. Achieving the market growth required to scale parboiling as a value addition process is likely to happen organically, and primarily in the smaller urban markets first.
Recommendations

Technology Improvements: Efforts are currently underway by the same design team to work at some of the heating and consistency issues, both of which may impact the ability to compete with higher quality imported products available in the more demanding Addis Ababa market. If demand for parboiled rice increases at a significant rate, a concurrent innovation need will be to match parboiler advances with drying technology which currently creates the larger production bottleneck.

Farmers Fill the Gap: More recently, several traders have started an experiment to purchase parboiled rice directly from rice farmers. These farmers are using the 25 kg aluminum pots over direct flame. Although this may increase the amount of rice available, it is yet to be seen whether it will be possible to maintain consistent quality to brand this rice. If MEDA continues to support this simpler technology, parboiling will likely be more of a stop gap service until sufficient demand drives the necessity for higher volume production.

Upmarket Support: MEDA has conducted preliminary research at the high-end market to test the quality of the parboiled rice. Feedback from large hotels in Ethiopia noted that, “the taste was good, but the rice doesn’t keep its shape,” and consumer demand is low still. MEDA and other market actors could work further on media promotions focusing on the nutritional value to stimulate consumer demand.

The marketing strategy for MEDA and partners should focus on winning over new customers to increase the inclusion of parboiled rice in their weekly meal planning, especially the market segments within regional urban markets. For this, marketing activities such as fairs, exhibitions, promotions to universities and school buyers, and local media advertising should be used to grow this base. MEDA’s present focus on the outer regional locations first will better allow the producers to learn in these markets to readying them for the challenges presented in larger ones such as Addis.
Client Story:
I Was Not Born to be Poor

Dele Ademe

Date: September 1, 2014

Dele Ademe is a rice farmer from the Amhara Region, in Northern Ethiopia. He is a father of four children and farms on 0.5 ha of land, which he owns. This land is the only source of income for the family. Prior to his participation in EDGET, he had never used inputs or improved farming technologies. The maximum amount of annual yield he produced was 2,000 kg, so small that it could not feed his family. Because of this, he could not send his children to school. Dele says, “There were times I was hardly able to provide my family with adequate food.”

In 2011, Dele took part in a number of trainings provided by MEDA. Through the skills he acquired during the trainings, he practiced row planting, pre-germination, and other improved farming techniques. His wife is among the 25 women trained in processing rice and is engaged in parboiling rice, which is bringing additional income to the family.

As a result of Dele and Enye Sisay’s active participation in the EDGET project, the family has experienced significant change in terms of income, assets, and living conditions of the family. He shared, “I was not born to be poor and do not need to despise jobs that are lower.”

Now the family owns two oxen, two cows for diary production, a refrigerator worth ETB 10,000 (CAD 633), a television, a water pump, newly constructed tin roofed house and grocery, a parboiling machine, a bed, a shelter for cattle, a kitchen among others. In addition, he is able to save a total amount of ETB 30,000 (CAD 1,899) in a bank. Two of their children have started to attend school. The rice farm and rice parboiling has become a family business that Dele, his wife and the two children support each other in running the business, generating more income. He also shared his appreciation for MEDA’s counsel and stated, “I am now confident to say that I am a rich person.”
Conclusion

The business case based on early observations, indicates that parboiling is an effective innovation that adds value to the rice produced by MEDA clients, even if it is only at early stages of its potential. It offers a relatively low investment model for existing small scale processors to increase the value of their product, producing a higher grade and more nutritious rice. MEDA’s supply chain partners have shown that when new customers are exposed to this premium version of locally produced rice, they like it, and thus retail demand is growing at a rapid rate in the smaller urban markets. Duplicating this success in the larger cities such as Addis Ababa remains the greater challenge without entry of food distributors with existing distribution channels and quality controls necessary to compete with other premium imported rice.

The most critical issue for all participants in the value chain is obtaining the scale as the markets develop. Current rice purchased for parboiling represents only a small fraction—less than one percent—of the rice produced by MEDA’s 8,000 plus clients. Although the increased income per kg is important, increasing the volume sold for higher value markets will provide the true income change. Although the parboiled market is not the only premium market to sell into, it does provide significant growth potential within the regional areas.

The cost and profitability model too appears valid for farmers, processors, traders/distributors and retailers. Similarly, from an efficiency measurement, the investment of MEDA through the Innovation Fund showed a healthy return where the value received by our clients far surpassed the original financial investment, and will continue to increase this return in coming years. Farmers are more than willing to invest the incremental effort into maintaining the quality of the paddy rice if they are able to obtain a premium price in return. The parboilers require good relationships with the farmers in order to obtain consistent quality of rice. In turn, this allows them to spend less time producing rice that meets the demands of higher value markets.

The parboiling equipment as designed appears to meet the current productivity needs, and can accommodate significant increased demand simply by maximizing the use of the existing machines. Once demand begins to outstrip current capacity, the current equipment can easily be manufactured locally and will continue to improve quality based in design revisions now being undertaken. Additional time will be required to determine whether or not the existing technology is sufficient to product the quality and consistency sufficient to compete in the urban markets.
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