POSTHARVEST PROCESSING OF RICE: PARBOILING, RURAL WOMEN AND PRODUCTIVE TECHNOLOGIES

NIGERIA WAY LEARNING SERIES
THE NIGERIA WAY LEARNING SERIES

The WAY Learning Series is an ongoing initiative to share lessons learned as the project is being implemented, with a particular focus on identifying and understanding factors that impact women’s business success and overall wellbeing in Bauchi State. Topics include women’s time use, girls’ self-perception after participating in skill-building opportunities, how cooperatives function as business platforms for women, and women’s perceptions of themselves as entrepreneurs.

The Learning Series is shared widely with the development community and with project stakeholders, including partners, clients, and government.

ACKNOWLEDGMENTS

<table>
<thead>
<tr>
<th>Author</th>
<th>Frances Fortune</th>
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<tr>
<td>Editors</td>
<td>Jennifer Denomy, Tanko Mahamudu and Fosen Grace Okelola</td>
</tr>
<tr>
<td>Photography</td>
<td>The Nigeria WAY team</td>
</tr>
<tr>
<td>Graphic Design</td>
<td>Wendy Helgerman</td>
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# ACRONYMS

ATF Agrotechnology Fund
EN Woman Entrepreneur
JICA Japanese International Cooperation Agency
LGA Local Government Areas
MEDA Mennonite Economic Development Associates
Nigeria WAY Youth Entrepreneurship and Women’s Empowerment in Northern Nigeria
NGN Nigerian Naira (currency)
SSB Small Scale Business
Youth Entrepreneurship and Women’s Empowerment in Northern Nigeria – Nigeria WAY – supports women and youth agroprocessors in three value chains in Bauchi State: rice, soybean and groundnut. The project focuses particularly on women and youth-led businesses, with activities aimed at improving productivity, adopting environmentally sustainable business practices, and increasing access to markets, financial services, market information, business networks, and partnerships.

The Federation of Muslim Women Associations in Nigeria (FOMWAN) and the Association of AgroProducers in Nigeria (ASSAPIN), two member-based alliances operating in Bauchi State, mobilize clients for the project. The project operates in seven Local Government Areas (LGAs), specifically selected because of their importance in Bauchi’s economy, feeding two key markets in Bauchi State – Bauchi and Azare – which bring together buyers, sellers, and processors for soybean, groundnuts and rice, among other crops. Businesses in Bauchi are largely small and informal, and the market remains nascent, with government – not the private sector – as a primary driver.
In this socially conservative state, women and young people face many obstacles in achieving business success. Mobility is limited for many women, and gender norms restrict the roles available to them. At the same time, endemic poverty increases the need for their economic participation. With increased access to productive technologies and business services, greater financial inclusion and inclusive community dialogues, Nigeria WAY supports women and youth-led businesses to transform their contribution to their households and communities.
Nigeria WAY Agrotechnology Fund

Nigeria WAY’s Agrotechnology Fund (ATF) is designed to provide increased access to and usage of productive technologies for women processors. The project facilitates increased usage of technology by stimulating demand among women, ensuring every piece of equipment is accompanied by training for its proper usage. Access is increased by forging market linkages between women processors and the agrodealers who sell the equipment. Nigeria WAY’s Agrotechnology Fund is similar to the Technology Fund implemented as part of MEDA’s GAC-funded GROW project. Using smart incentives, GROW successfully made available specific equipment to support women in their soybean production and processing which they purchased.

Selected technologies were piloted during WAY’s second year of implementation in order to understand how best to ensure that women can own and use these technologies, as well as assess the impact on their time and labour. During this pilot phase it was found that the technologies tend to increase women’s agricultural efficiency, mainly by reducing the burden of labour.

The ATF offers women a chance to purchase from a menu of 10 technologies, each under $500. Interested women are linked to vetted and contracted agrodealers at a range of awareness raising events, trainings and other promotional activities conducted by WAY partners. As part of their contract with WAY, the vendors agree to train all woman purchasers on the use, care and upkeep of their equipment. In addition, timing is important; the technologies must be available during the appropriate part of the agricultural cycle, and farmers or processors frequently lack capital at the planting or growing phases.

Even with increased access to supply, the technologies are expensive for the women processors, many of whom would be unable to purchase even a single item of equipment without financial support. MEDA’s smart incentives enable women to purchase technology at a discounted rate, with all transactions tracked by vouchers. Women purchase vouchers for their chosen technologies during specific training events, and redeem them from agro-vendors, who then invoice MEDA for the remaining portion of the price. If women need credit to acquire the technologies, they are linked to MEDA-supported MFIs, who will take part in the events organised to showcase productive technology.

1 MEDA’s Greater Rural Opportunities for Women (GROW) project improved market access, food security and nutritional status for 23,368 women smallholder farmers and their families in Ghana’s Upper West Region through integration into the soybean sector. The project was implemented from 2012 to 2018.

2 The GROW project’s Technology Fund facilitated women’s access to labour-saving equipment through local private sector providers. In total, 5,196 women purchased 7,376 technologies. The Technology Fund successfully catalyzed change, stimulating adoption of new technologies among women and encouraging suppliers to expand to new client segments, namely women farmers. For more information, see the GROW Learning Series document Putting Technology into the Hands of Women: https://www.meda.org/s/1010

3 In WAY’s year 3, women paid 40% of the equipment cost and MEDA paid 60%. In subsequent years, MEDA hopes to increase the amount that women pay, gradually withdrawing the subsidy so women are paying closer to the market rate, in anticipation of the subsidy’s eventual end.
INTRODUCTION

The purpose of this case study is to capture Nigeria WAY’s learning on postharvest processes in the rice value chain. Subsequent documents will share lessons on the soy and groundnut processing sectors. This case study is drawn from activity reports, partner reports and interviews in several locations with client groups working in the rice value chain who have benefited from postharvest processing training. In year three of the project, 445 ENs were trained by JICA and Golbokki Ventures. Some of these clients have benefited from the project’s Agrotechnology Fund receiving a voucher to purchase productive equipment at an incentivised rate from local Agrodealers.

Rice is relatively easy to cook and store, and there is a growing demand in Nigeria. Nigerian consumers show a preference for imported rice due to the high level of cleanliness (i.e., free of stones and debris). Local rice millers suggest that improved processing, especially destoning, will increase the quality of the locally processed rice. To improve internally generated revenue and reduce imports, the Federal Ministry of Agriculture and Rural Development (FMARD) has been promoting improved domestic rice production.

The 2019 closure of land borders of Nigeria by the Federal government has stimulated demand for locally processed commodities especially rice. This has meant an increased demand for rice and increased activity in the rice value chain. In Bauchi, the price of domestically produced rice has increased 67%, depending on the quality and type of the rice.

The WAY team’s work in the rice value chain aims to improve the quality of domestically produced and processed rice, and to reduce the time and labour burden of that work. One third of WAY’s clients are rural women who parboil rice in a multi-stage process that improves nutritional quality of the rice and reduces domestic cooking time. Roughly the same number (one in three) of clients report that parboiling is their most lucrative processing activity and it is a labour-intensive process; WAY’s activities increase the efficiency and performance of women-run parboiling businesses by reducing the time and labour required.

This case study includes the following sections:

- background on why rice parboiling is important in the Nigerian economy and the rice parboiling sector in Bauchi;

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4 In 2004, it was estimated that the annual per capita consumption of milled rice is 25 kg per person.
5 WAY EN survey result January 2020.
• description of the two technologies available to Nigeria WAY clients – the pot cover and false bottom, and the fuel-efficient parboilers;

• results of the Postharvest Processing Training with the Pot Cover and False Bottom technology and the parboiler, and an illustration of how these skill building interventions have been designed to facilitate market connections; and

• next steps and key results.

WHY PARBOIL? POSTHARVEST PROCESSING OF RICE

Parboiled rice is a staple in the Nigerian diet. The process involves partially boiling rice in the husk, which is rich in proteins, fibers, vitamins and fat; during the parboiling process, these migrate from the husk into the edible endosperm coating of the rice grains. Parboiled rice is superior for three reasons: it has added nutritional benefits, it takes less time to cook and it can be milled more easily and consistently without breaking. These desirable qualities ensure parboiled rice is in high demand in Nigeria.

Processors in Nigeria, particularly women processors, have inadequate knowledge of and lack productive equipment for postharvest rice processing. As a result, the overall quality of domestically produced rice is low, with a high percentage of broken grains and stones mixed in with the rice. The price of domestic rice is also low, and this discourages farmers from expanding or

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6 Citing Farouk and Islam, 1995 in Bello et al, 2015
improving rice production. Postharvest loss rates of rice are estimated at 15 to 20%, and this is identified as the most significant bottleneck in domestic rice production expansion. Postharvest losses prevent income increases for rice farmers and processors.

Research on parboiling rice reports that traditional parboiling activity has a rate of return on investment of 114%; production capacity and quality are relatively

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7 The Japanese International Cooperation Agency (JICA) is supporting several Nigerian government agencies, including the National Food Reserve Agency, the Federal Ministry of Agriculture and Rural Development and the State Agricultural Development Program, with technical assistance on postharvest processing and marketing.

low. With improved techniques and equipment, the rate of return is between 50% and 60% due to the higher capital requirements and higher cash flow needs for improved productivity.\(^9\)

Parboiling of paddy rice is the main task in a multistep process of postharvest activities. It involves cleaning the rice, boiling it and drying it, as illustrated above. Inputs required for rice parboiling are the equipment or pot, firewood, water, labour and a drying area, as well as transportation. The cost of inputs for rice parboiling are low: mainly the working capital and the fixed investment costs. Nigeria WAY’s EN survey found that 20,000 NGN (CAD 73) is typically required as capital.\(^11\) Most of this is used for the purchase of the raw material.

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\(^10\) Ibid., P. 32.

\(^11\) 2020 Annual Survey WYE EN results.
There are three levels of production undertaken by women in the rice parboiling sector in Bauchi State:

- **At the household level**, women buy paddy rice and parboil at home using their own cooking pots. This parboiling activity is for both consumption and to earn income in the local market. This is done in small quantities and can be done on a daily basis. They use their domestic pots (see photo, figure 3), firewood and water. This is a common income generating activity to earn daily cash, particularly in areas where *purdah or seclusion* is practiced.\(^{12}\) At the domestic level, women typically parboil one bag (75kg) per week.

- **Commercial parboiling** is typically done by groups of women, who purchase paddy when they have available cash and parboil it for sale in larger, locally made pots. These pots are generally dedicated to parboiling activities. If the women do not have capital, they provide parboiling services for others at a fixed price, usually 1000 NGN (<$4) per bag. (See figure 4). For commercial parboiling enterprise, they would parboil up to 3 times as much as a domestic parboiler.

- **Larger scale local processors** use higher capacity equipment, firewood and water, processing by the bag in larger quantities (figure 5).

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\(^{12}\) Hausa phrase for seclusion of women of marriageable age.
Women rice processors have minimal access to productive equipment to reduce the burden of labour in processing and receive little or no training in processing techniques. Instead, they use traditional methods, taught by their mothers and peers. The result is a poor-quality product which sometimes has an odour, as it has been soaked too long. Grains are unevenly cooked – some are overcooked and some are undercooked. This affects the colour of the rice kernels and the overall hardness of the rice grains, the percentage of broken pieces and the cooking time for the user. Aminu Barau, owner of a Bauchi rice milling company Golbokki Ventures, reported that he excluded women from his supply chain purchasing because of the poor quality of their parboiled rice.

<table>
<thead>
<tr>
<th>Bauchi State Rice Parboiling Sector</th>
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<tr>
<td><strong>Household parboiling</strong></td>
</tr>
<tr>
<td>1 bag per week</td>
</tr>
<tr>
<td>Cost: N200 for firewood</td>
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<tr>
<td><strong>Commercial parboiling</strong></td>
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<tr>
<td>3 to 4 bags per week</td>
</tr>
<tr>
<td>Cost: &gt;N500 for firewood</td>
</tr>
<tr>
<td><strong>Large scale local processing</strong></td>
</tr>
<tr>
<td>Some women, mainly men</td>
</tr>
<tr>
<td>10 to 15 bags per week</td>
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Technology: pot cover and false bottom
Technology: parboiler
Increasingly capital intensive

Figure 5. Large Scale Parboiling

Figure 6. Source for pricing information: PrOpCom Investigation of the Rice Commodity Chain in Dass / Bauchi Area

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13 2017, Inception Mission Research and 2018 FarmTies Research confirmed lack of access to agrotechnology.
14 2018, Interview with Golbokki Ventures
Rice parboiling has peak labour demands during the harvest period (typically in November and December, in Bauchi) and decreasing amounts of work as the season progresses. EN survey data shows that most women do parboiling on a daily basis for 12 months of the year and typically spend 101 days per year on rice parboiling activities.

The chart below shows the number of months per year that WAY client ENs engage in agroprocessing activities. The light purple bars reflect all agroprocessing activities, including soy and groundnut processing, and the dark purple bars show time specifically spent on rice parboiling. Most respondents engage in agroprocessing year-round. The next largest number of respondents engage in agroprocessing only four months per year, suggesting a high degree of seasonality; they likely purchase raw materials at harvest times and process them in the month or months immediately following.

Figure 7. Months per year that women and youth entrepreneurs spend on rice parboiling and other agroprocessing activities

15 Baseline Study, WYE Results
SUPPORTING THE RICE VALUE CHAIN

As outlined in the figure below, Nigeria WAY’s focus in the rice value chain has been two-fold: i) to improve women’s skills in parboiling and ii) to improve access to productive equipment for parboiling. Both approaches leverage WAY’s private sector partners, relying on their commercial networks and professional credibility to provide valuable products and skills to women parboilers. The WAY team facilitates these processes, selecting and vetting the private sector partners, and building and strengthening the market linkages between women parboilers and these companies.

**Access to Productive Technology**

*Private sector partner:* Xpedient Global Ltd, training fabricators to make pot cover and false bottom  
*Target clients:* household & small business (ENs and SSBs)

*Private sector partner:* Roshan Global, manufacturing bespoke eco-parboiler  
*Target clients:* larger commercial enterprises

**Improved Parboiling Skills**

*Private sector partner:* Golbokki Ventures  
*Key intervention:* Golbokki trains women ENs and SSBs on parboiling techniques using pot covers and false bottoms
PRODUCTIVE EQUIPMENT IN THE RICE VALUE CHAIN: STIMULATING MARKET LINKAGES

WAY is promoting two technologies for improving parboiling. One is the **pot cover and false bottom** and the other is a fuel-efficient **ecoparboiler**, specifically designed for use by women. The ecoparboiler is an improved system for parboiling rice, which raises quality and increases production volume. The two technologies are designed for women’s easy use and meet Nigeria WAY’s requirement that productive equipment be gender responsive.

To promote lasting, mutually beneficial relationships, WAY links women processors directly to local companies which produce the technologies. Technology producers conduct training on their equipment to groups of women ENs and SSBs. After completing the training, women are given a voucher which enables them to purchase that technology at a reduced cost. The voucher can be redeemed with one of the local fabricators. Depending on the size and cost of the technology, women may purchase as a group. Some groups have taken loans from a local microfinance institution to facilitate the purchase.

1. **Pot Cover and False Bottom**

Traditional parboiling methods result in uneven cooking, leading to low quality rice. A simple technology fix, a pot cover and false bottom, raises the rice quality and reduces the amount of firewood used, the amount of water needed, and the time used for parboiling. Thus, women’s time and labour are reduced (less water to fetch, less time over the fire), the costs of firewood are reduced, and the quality of the parboiled rice improves.
Using the pot cover and false bottom technology raises the quality of the parboiled rice by ensuring equal heat treatment to each grain. Better quality parboiling reduces the colour differential, and can reduce cracking and breakage of the grains during milling. The sieve bottom fits into the bottom of the pot and creates a space between the bottom of the pot and where the rice sits. So when the pot is put on the fire, the water boils below the sieve and steam then rises into the rice. The sieve bottom is a steamer made for rice pots. A pot cover is essential to keep the heat in the pot and reduce overall cooking time. Thus, women's time and labour are reduced (less water to fetch, less time over the fire), less firewood is needed, and the quality of the parboiled rice improves. According to JICA, the market value of the rice increases by 30%.

With the support of JICA, the Federal Ministry of Agriculture and Rural Development (FMARD) has been promoting the use of this simple technology to improve the quality of domestic rice parboiling. In 2019, JICA and FMARD invited representatives from all states to Abuja for a training on raising the quality of domestic rice production. Subsequently the JICA trainers were invited to Bauchi and conducted a Training of Trainers for 37 people selected by Nigeria WAY and Bauchi State Agricultural Development Project who would be involved in the roll out of a widespread training across the 7 LGAs where Nigeria WAY works. This included women extension agents and rice millers.

The pot cover and false bottom are appropriate for rice processors who are using a traditional pot (various sizes, depending on quantity of rice). This includes the two groups: women parboiling paddy rice individually in their homes, providing some for their family use and selling the rest in the local market to earn some income; and women parboilers who use larger pots and parboil primarily with a commercial focus. They may process up to one bag of paddy (80 kgs) at a time, often three to four bags per week, and are engaged in commercial parboiling.

Don’t boil paddy but steam it.

Don’t let out steam.

Fake Bottom
Local Fabricators

Xpedient Global Ltd is an expert local fabricator and a Small-Scale Business engaged with MEDA. They too were trained by JICA and now fabricate the pot covers and false bottoms using aluminum from melted cans, cast in sand forms. The pot covers and false bottoms vary in size and price, according to the size of the pot the women parboiler is using.

Supported by Nigeria WAY, Xpedient trained 20 local fabricators in six different Local Government Areas (LGAs). Each local fabricator was given a ‘starter kit’ – molds and enough raw materials to produce five false bottoms. Women processors who completed training were given a voucher, allowing them to purchase the pot cover and false bottom from the local fabricator at a reduced price.

Figure 8. Local fabricators preparing a false bottom mold

2. Ecoparboiler

Roshan Global Manufacturing is an Abuja-based, woman-owned company producing fuel-efficient cooking equipment. In 2018, Roshan built a prototype ecoparboiler, incorporating suggestions made by women processors who visited the factory. The design of the ecoparboiler included a single container in which the rice could be soaked over night and then subsequently cooked in the same container, eliminating the labour required to move the rice to a fire. It has a spigot so the water could be drained and then the same container would have a fire set under it – in a fuel-efficient manner. The bespoke prototype met the FMARD-mandated standard, including the sieve

Figure 9. Prototype Parboiler Fabricated by Roshen Global
bottom to ensure each grain of rice is steamed evenly and a pot cover or lid to reduce the time required for cooking.

This ecoparboiler can effectively parboil two bags of rice in 2 hours, once the initial steps of cleaning and soaking the rice are completed. This significantly reduces the cooking time from 10 hours to 2 hours. The other steps in the parboiling process (as shown in figure 1) take the same amount of time. The overall amount of time for parboiling 2 bags of rice is reduced by 92%.

To forge market linkages and grow Roshan’s market share, Nigeria WAY partner ASSAPIN supported the company to conduct ten “field days,” mini-exhibitions to showcase the ecoparboiler to women in the rice growing locations where many EN clients work.

After the field day demonstration, thirteen women’s groups wished to purchase ecoparboilers, at a price of NGN 350,000 each (CAD 1,282), including delivery, installation and a one-year warranty. Roshan also provided post-sales service, making repairs to parboilers that were reported as faulty. Under the Agrotechnology Fund, women’s groups paid 40% and Nigeria WAY paid 60% of the cost. Only one of the thirteen groups was able to pay outright, with the remaining twelve taking loans from Tijara MicroFinance Bank, which was present at the field days.

Birna Women’s Cooperative Purchases a Parboiler

Birna Women’s Cooperative in Warjii purchased a parboiler with a loan from Tijara MicroFinance Bank. They delayed using the equipment because they felt they did not know how to operate it properly. After a retraining exercise was conducted, the group gained confidence and began using the parboiler. The loan terms dictated repayment within six months, which the women were able to meet. They reported that previously, it took them a whole day to parboil 1 bag of rice and required 500 Naira worth of firewood. With their new eco-parboiler, they said they could process two bags of rice in two hours, using only 200 Naira worth of firewood. They are saving time, labour and money.
IMPROVED SKILLS: POSTHARVEST QUALITY TRAINING FOR RURAL WOMEN PARBOILERS

Nigeria WAY facilitates business development services (BDS) for women parboilers. Specifically, selected private sector partners are providing technical knowledge and market information to the women. In addition, the linkages formed between the women and the private sector last beyond the training and lay the groundwork for future business transactions.

During the initial WAY market assessment conducted in 2017, Aminu Barau, miller and proprietor of Golbokki Ventures, stated that he had a supply problem. His mill, with a 7.5 mt capacity including a destoner and grader, was running at less than half capacity. He could not consistently source enough quality parboiled rice to operate his mill at capacity. He was forced to do a significant amount of parboiling himself to meet demand and ensure consistent quality. He said, “I would never buy rice from women – they don’t know how to parboil!”

Early in 2019, WAY identified Golbokki as a promising lead firm and brought Barau to a JICA training session on parboiling. Though he was already an experienced parboiler, he attended the training to understand good practices and government standards, so he could train women who could become part of his supply chain. Following this training, Golbokki Ventures was contracted to train Nigeria WAY clients on household and small business-level parboiling. He chose locations for the WAY trainings strategically, in areas where he purchases his rice supply, in order to maximize the possibility of developing market linkages with women ENs. Using Golbokki as a business development service provider for WAY clients allows women to obtain market-relevant information on how to prepare their product to specific

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There is no data yet on the extent to which Golbokki purchases rice from these women to meet his supply issue. However, he is providing important training to women in the area where he buys rice. After the next season, WAY will investigate whether he has started to buy rice from the women.
Impacts of Parboiling Training: Client Reflection

After receiving training, a parboiler from Ganjuwa LGA in Bauchi State shared her story: “The MEDA project which is to train women in the new technology in our activities of parboiling rice will go a long way to always remind of being careful in our activities of buying and selling. In the past, I was just doing the business just to keep myself busy, not minding whether or not I make profit. You will suffer to process rice and at the end of the day you take it to the market, sell and come back wondering what you used the money for. But I am delighted for being selected to be part of this pilot training; for these three days it has broadened my knowledge and learned a lot of lessons from it. From now henceforth my business will be carried out and run differently.”

standards. In addition, the training provides a vital market linkage, where women are connected to a commercial buyer for their product.

To conduct the training, Golbokki employs women extension workers with the Bauchi State Agricultural Development Program BSADP who were trained by JICA in parboiling techniques. They identify women parboilers by location and bring them together to receive training on good practices, including parboiling techniques, drying, destoning, milling, grading, packaging and storing rice. In addition, they are trained on technologies that are available to them through Nigeria WAY’s Agrotechnology Fund.

In addition to being able to strengthen his supply chain, Barau’s training activities with WAY build his brand and strengthen his reputation in the region. He packages and sells his own rice brand, called “Malama Rice,” and his brand and his influence in the region are growing, partly through this market exposure.

Figure 13. As of April 2020, Golbokki has trained 375 women in 4 LGAs in rice parboiling techniques
One of the participants expressed her happiness saying she didn’t know that you could use such simple methods to process quality rice to the same standard as foreign rice. She said before the training, she used to process rice but the quality has improved with what she has learned.

Another participant said she used to take the whole day to process only one or two bags, but with what she has learned she will be able to produce more in a day while saving time to do other things.

A participant also said she used to dry her rice under the sun, which causes breakage during processing. In the training, she learned how to dry her rice in the shade, and better-quality rice will be the end result.

One of the participants said she has learned how to parboil rice using a lid. She promised to pass this training on to her group.

Others said they now know how long to parboil Jamila and China types of rice.

KEY RESULTS

As of March 2020, Nigeria WAY is happy to report the following successes in the rice parboiling initiative:

- 510 women parboilers and 37 extension agents have knowledge of improved postharvest processing for domestic rice and knowledge of the technology required to do this.
- Women are seeing direct improvement in the quality of the rice they are producing and their confidence in their product is increasing.
- Improved skills and technology reduce women’s workload and costs less in terms of expenses for firewood and labour for water.
- Active engagement and presence of market actors in WAY events – specifically rice millers and local fabricators – provides women with new techniques but also connections to market actors where they might have shared commercial interest.
- The enterprises increase their market share through these connections. In several cases, independent business transactions may have taken place.
- Women’s groups have proven that they are interested in and able to purchase equipment to support their commercial rice parboiling activities.
WAY will continue to scale up provision of these technologies with particular focus on the ecoparboiler, which women have indicated works well for them.

NEXT STEPS

In the coming year, Nigeria WAY will build on the success of the Agrotechnology Fund, continuing to leverage the private sector partners’ training and technology provision to stimulate and build market linkages. This private sector engagement is critical for sustainable supply of new technologies.

Specifically, next steps for improving business efficiency in the rice parboiling sector will include:

• **Improved Parboiling Skills Training**
  The communities selected by Golbokki for training (with MEDA) are considered influencer communities as market networks branch from there. Further follow up will be done with clients to understand changes in techniques and adoption of technology. The annual survey will capture the capacity that the women clients were able to sustain in their work and to understand more fully the benefits they derive from the intervention.

  Tijara Finance, who supported the purchase of the parboilers by women’s groups, recommended: retraining for women on use of the parboiler; provision of financial literacy training along with loans to women’s groups; and provision of a written warranty from Roshan, complete with contact details.

• **Peer to Peer learning**
  Seven of the 12 women’s groups managed their loan and their parboiler well. One group set up a management system, including a minimum fee for using their parboiler so it could be cleaned after use. A peer to peer learning system will be considered to share knowledge and experiences across the women’s groups, providing informal business development training.

• **Expanding access to finance to purchase parboilers**
  Only 14 parboilers have been purchased to date. Design issues, which had caused complaints, seem to have been rectified, and now many women’s groups want to purchase the parboilers. WAY will work with MFI partners and women’s groups to expand access to larger equipment for their rice parboiling enterprises.
• **Growing Experience**

WAY has tested the hypothesis that women's groups that can afford and manage a parboiler collectively. The next hypothesis to test is whether such groups can take on progressively larger and more complicated rice processing technologies over time. For example, many groups have requested rice mills. If groups can manage parboilers, which are relatively simple pieces of equipment, they may wish to take on more complex machines such as mills and destoners, more complicated because they are operated by engines. Naturally, different groups work at different speeds within their own capacity, so the model as presented here could vary from case to case. A competitive bid to find a business development provider who can build an enterprise model for postharvest rice processing will be launched.

![Figure 14. Progressive Ownership and Access to Productive Technology for Women](image)

• **Technology Fairs and Innovation Events**

Linking agrodealers to women customers in the Local Government Areas (LGAs) has proven to be a successful model, as agrodealers beginning to understand that women are a market segment who require a different type of marketing. The technology fairs and innovation events which have hosted local fabricators, agrodealers, women and men farmers and processors have been well attended and there is appetite for more of this. Key to the success is to ensure that MFIs are available to facilitate access to finance.

The value chain work around parboiling is to support women ENs to improve their skills and ensure they get a better return on their time, labour and skill investment. Many women in Bauchi State use parboiling as an income generating activity. Improving their business outcomes, in terms of knowledge, skills and capacities as well as introducing the possibilities of growth in an environmentally conscientious way will have a direct impact on their welfare and that of their families, as this is mainly where they use the income.