SUN KING BOOM AND WOMEN ENTREPRENEURS:  
A CASE STUDY ON GREEN TECHNOLOGY ADOPTION BY BAUCHI BUSINESSWOMEN

A NIGERIA WAY CASE STUDY  
RURAL WOMEN AND PRODUCTIVE TECHNOLOGIES
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### List of Acronyms

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<td>ATF</td>
<td>Agro-Technology Fund</td>
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<td>GROW</td>
<td>Greater Rural Opportunities for Women</td>
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<td>LGA</td>
<td>Local Government Area</td>
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<td>NGN</td>
<td>Nigerian Naira</td>
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ABOUT THE NIGERIA WAY PROJECT

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 Agro Producers 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 and ultimately to the Nigerian economy.

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 well-being 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.

EXECUTIVE SUMMARY

Nigeria WAY’s Agrotechnology Fund (ATF) is designed to provide increased access to and usage of productive technologies for women processors. Access is increased by forging market linkages between women processors and the agrodealers who sell the equipment or fabricators who manufacture it. The project facilitates increased usage of technology by stimulating demand among women and ensuring every piece of equipment is accompanied by training on proper usage. ATF equipment is selected to ensure it will reduce drudgery for women and not increase it. Selected technologies were piloted during WAY’s second year of implementation to understand how best to facilitate women’s ownership and use of these technologies, as well as to assess the impact on their time and labour.

In December 2020, the WAY project conducted a survey of 31 Women Sales Agents (WoSAs) to examine the impact of the Sun King Boom solar lamp on their businesses and livelihoods. The survey provided specifics on the impact of the technology on women’s agency and rights, asset ownership, access to information, as well as business and household impact. Using the survey data, this study outlines how investment in women’s access to technology reflects changes in their households and communities. Secondary data from a pilot survey tested with five women sales agents was also consulted (which informed the scale up of the project).
INTRODUCTION

This learning paper explores the impact of the ‘Sun King Boom,’ a multifunctional solar powered lamp manufactured by Greenlight Planet,¹ as a technology critical to promoting an inclusive market system and promoting gender equality among businesswomen. This study is the third in a series (beginning with Millers and Grinders and Postharvest Processing of Rice, Rural Women and Productive Technology) that contributes to understanding how women use technology to support their businesses and how the Nigeria WAY project interventions contribute to gender equality and social inclusion in the business domain. The paper analyzes findings from quantitative survey data gathered from some of the women who purchased the solar lamp with support from Nigeria WAY.

A 2019 report by Cahmen Nigeria Limited, titled *How women and youth entrepreneurs receive, understand and use market information*, outlined limitations that these entrepreneurs face, including access to information sourcing devices, limitations in energy for charging devices and network connectivity as some of the barriers to access and use of information. The report also identified face to face communication as one of the most efficient and preferred methods of information dispersion among women. These findings partly informed the formation of Nigeria WAY’s Women Sales Agent (WoSA) model, shaped business development training and informed the addition of information accessing technologies to the Agro-Technology Fund.

WoSAs are businesswomen selected by their community to act as market linkages for their peers. Gender and social norms mean some businesswomen do not have access to the market or public spaces where business and market information are available. The WoSAs received several business development skills trainings, and all the training material is recorded on SD cards which were then given to the participants along with a printed copy in Hausa.

The Sun King Boom Technology

Sun King Boom is a solar powered device manufactured by Greenlight Planet USA with four basic functions: i) An LED light with three light modes – Turbo (160 lumens), Normal (75 lumens) and Low (25 lumens), providing 36 hours of illumination, ii) an FM/AM radio function with an inbuilt antenna capable of storing up to 10 channels, iii) an SD card function capable of reading and

¹ Greenlight Planet is a for-profit social business that designs, distributes, and finances solar home energy with an under-served population in mind: the 1.2 billion global consumers for whom the old-fashioned electrical grid is unavailable or too expensive. Since its founding in 2009, the company has become a leading global provider of solar-energy products to over 60 million rural consumers in more than 65 countries.
playing up to 32gb of audio data and iv) a 5V USB power output capable of charging mobile phones and other devices. The device has a solar panel to charge the battery. On purchase, Greenlight Planet offers a one-year warranty on parts.

This technology was selected as a useful device to support Women Sales Agents in their role as market liaisons, providing market information and linkages to peer entrepreneurs in their community. Two other technologies were investigated: Talking Books, battery powered devices which store and play pre-recorded messages which were previously used on MEDA’s GROW project Ghana, and the Hitch device: a battery powered mobile digital library on which videos can be updated and used offline, an innovation from the Canadian Technology Incubation Centre. The Sun King Boom was chosen due to its affordability, simplicity of operation, ability to deliver both tailored information through SD card reader and public information through the radio, its multiple utility functions for lighting and charging devices and finally due to its green component, being a solar powered device. These functions address the primary limitations outlined in Cahmen Nigeria Limited’s report *How women and youth entrepreneurs receive, understand and use market information*, referenced above, namely poor network connectivity and entrepreneurs’ limited access to devices and energy for recharging.

![Figure 1: The Sun King Boom Device from Greenlight Planet](image)

The technology was piloted with five WoSAs from different Local Government Areas (LGAs) to understand the obstacles the technology might create for businesswomen, particularly around the SD card reader. They were given a short training session on how to use the various functions, how to charge the lamp with the solar cell and how to insert and play an SD card. After the training, they were asked to try the device in their homes for 14 days. Their
positive reviews and feedback after the trial period led to the full adoption of the technology into the list of gender-responsive equipment promoted by Nigeria WAY for its clients. To date, 350 solar lamps have been purchased by women through the direct price discount of the smart incentives.²

**METHODOLOGY**

This learning paper analyses primary data generated from a questionnaire designed to gauge the impact of the Sun King Boom. This questionnaire (see Appendix 1) was administered to 10% of the total WoSA population who had purchased the Sun King Boom technology by that time (N=310), using incentives from Nigeria WAY. The survey population (N=31) was randomly sampled across all seven Local Government Areas where MEDA operates. The results are framed using the three main principles of MEDA’s Gender Equality and Social Inclusion framework, namely access, agency and just and equitable enabling environment (see textbox for more detail). The results are presented in four sections: section 1 focuses on the relationship between the WoSAs and the technology; section 2 focuses on the technology as a tool that promotes access to and use of market information for its users; section three outlines the relations between the WoSAs and the device as it relates to agency and rights; and the final section focuses on technology as it relates to the physical

² Smart Incentives: Mechanisms used by MEDA to stimulate markets and create direct access to technology, market actors and to increase participation in the value chain. Source: Nigeria WAY Project Implementation Plan 2017.
and enabling environment of its users. This learning document also employs secondary data from project reports.

The survey respondents are women agro processors engaged in the MEDA target value chains of rice (38% of respondents), soy (10%) and groundnut (52%). In terms of age category, 48% of the respondents are women between 25 and 35 years of age while 42% are women aged 36 and above. Women agro processors between 18 and 24 years old constituted 10% of the sampled population. The women were selected by their peer group in the community to act as a market linkage for those who have less access due to mobility constraints. The criteria that qualifies them as Women Sales Agents include negotiation abilities, mobility, leadership capacity within their groups and level of activity within the Savings and Loans groups.

Gender Equality and Social Inclusion at MEDA

MEDA’s theory of change for increased Gender Equality and Social Inclusion (GESI) prioritizes developing more equitable and inclusive market systems for sustainable economic growth. MEDA works with excluded groups, particularly women and girls, to improve their access to and use of the following:

- Decent work and equitable opportunities and skills development.
- Assets, natural resources, financial services and other needed supports to advance economically; and,
- Resources to adapt to climate change and build resilience to economic and environmental shocks.

Additionally, MEDA considers how our programming can enable excluded groups, particularly women and girls, to enhance their personal agency and ability to claim their rights, by advocating for:

- Manageable workloads and sharing of care responsibilities.
- Ability to live free from violence and harassment with improved mobility, security, and mental and physical well-being; and,
- Improved agency and collective action, decision-making authority, and influence in different spheres.

Overall, MEDA takes a systems approach to promote these objectives. Our programming engages with diverse clients and partners to promote GESI and cultivate a just and equitable enabling environment. This structural change addresses gender biases/inequitable social norms, and includes engaging with men, boys and other key gatekeepers.
RESULTS

Access and Use

WoSAs who were being trained in Business Development Services to their role as WoSAs were incentivized by Nigeria WAY to purchase the Sun King Boom. For each training session they completed, they were given a voucher which could be used towards purchasing a Sun King Boom device, to acknowledge the time and effort they gave to participate in the training. These vouchers gave them a percentage discount on the Sun King Boom technology from an identified vendor who had been linked with Greenlight Planet to obtain steady supply of the technology. Sixty-two percent of the trained WoSAs purchased the Sun King Boom.

The 31 WoSAs who were surveyed reported the following:

Ownership: Sixty-one percent of the respondents stated that they do not own a radio while 39% reported owning a radio prior to acquiring the Sun King Boom device. Ninety-six percent of respondents claimed that the Sun King Boom gave them access to information through the radio on the device.

All the respondents from the survey displayed interest in the Sun King Boom device. Seventy-nine percent of the surveyed sample expressed their satisfaction with the device and declared their interest in buying another given the same price discount. Twenty-one percent of the respondents also expressed their interest in a second purchase but cited affordability constraints. The interest was attributed to its wide utility for both business and household functions. Ninety-
two percent claimed owning the device gave them access to tailored business information on diverse ways of utilizing soy for both business and household consumption, information on the JICA improved rice parboiling technique that promotes quality, reduced resources and improved income and several other agro production and processing techniques through the SD cards.

Another factor that may have played a role in the increased adoption of the device by women is its simplicity of usage as attested by 86% of the respondents even though 14% of the respondents outlined some difficulties understanding and operating the device.

**Increased access to information:** Ninety-six percent of the respondents use the radio function to access information while 4% do not. Among the respondents using the radio function, 41% listen during the morning hours. Similarly, 48% listen in the evening and the remaining 11% in the afternoon. From the survey, it was evident that these choices were influenced by three basic factors: availability of free time, affinity for a certain program and their business. Seventy percent of respondents who use the radio function stated that the time of day they listen is determined by periods of lower activity. Twenty-six percent of the respondents claimed they prefer the chosen time because of a certain program they like. The remaining 4% of the respondents claimed their time for listening to the radio is influenced by the time for their business.

This data also confirms the busy nature of women within the surveyed localities. It further reveals how drudgery and engagement in household labour can acts as a hindrance to women’s access to information, as 70% of the respondents claimed they only listen to the radio when they have time available.

**Information preference from device:** When asked about their preference on type of information they listen to, 72% of the respondents preferred information on agro processing, which includes rice, groundnut and soy processing techniques. Twelve percent preferred information on agro-production including good agricultural practices for soy and groundnut and use of biotechnologies, namely Aflasafe and Nodumax. Sixteen percent of the respondents preferred information on bookkeeping, marketing, pricing, and other business development services. These preferences might partly be informed by WoSAs’ existing business ventures which was the basis of their admission to the Nigeria WAY clientele.
**Which function was the most used and why:** Seventy-five percent of the surveyed respondents selected the lamp as the most used function on the device, claiming absence or low grid electricity supply within their localities – and therefore their lighting – as insufficient for conducting their businesses. This however shows that women using this device have choices on what they use it for which speaks to their agency in the household.

**Agency and Rights**

**Prevailing Conditions Before Ownership:** Data from the survey showed that 36% of the respondents are either not connected to the national electricity grid or connected to a non-functioning one. These respondents usually spend more money on batteries or fuel to generate light for their household or businesses. Thirty-two percent of the respondents have 1 to 3 hours of lighting daily from the national grid. Another 32% have 4 to 6 hours of electricity from the national grid daily. This poor electricity supply comes at a cost to the households and businesses of these WoSAs.
Prior to owning the Sun King Boom device, 64% of the respondents attested to using torches (flashlights) as their source of light while 32% attested to using the Obasanjo Lamp (a locally fabricated torch that uses LED light bulbs powered by three 12-volt batteries).

An Obasanjo lamp many people use for lighting their homes
How has the most used function impacted your household and businesses: All the respondents from the survey claimed that either their children or their spouse use some functions on the device. Seventy-four percent of the surveyed respondents claimed that their children use the device. Fifty-five percent of children used the lamp function, 20% used the charging function and 25% used the radio and SD card function for access to information. Similarly, of the total respondents, 26% claimed that their spouses uses the device. Disaggregation of usage by spouses shows 57% for radio, 29% for charging other devices and 14% for lighting. This pattern of usage confirms that women and children conduct most of the domestic activities, hence the increased use of the lighting function, while the men use more of the leisure functions on the devices. Owning the device clearly shows it increases contribution of women to the household which adds to their agency.

The survey also showed that owning the Sun King boom device saved the women an average of NGN 286 (1 CAD) per week which would have been spent on batteries for their torches and Obasanjo lamps.

Enabling Environment

Broader Community Impact: 75% of the total respondents affirmed that owning the device has had an impact on their SLGs. They further claimed that
the lamp, radio, SD cards and even the charging function all have impact on the women’s group, especially during their group meetings. They claimed the device provides a platform for collective listenership during group meetings either through using the radio to listen to a program together or listening to pre-recorded material on a SD card. This collective listenership promotes the social capital of these women and further encourages peer to peer learning within the SLGs. This further strengthens the WoSAs’ role as liaisons between the women and the market. Movement restrictions imposed during the COVID-19 pandemic might have further increased these gatherings.

CONCLUSIONS AND LEARNINGS

Overall, understanding women’s point of view on the technology they purchase provides insights into the benefits these devices bring, and the importance women place on different types of benefits of technology. These benefits are both social and economic and often overlap, as is seen through this study.

General Learnings

1. Women are willing and able to invest in technologies that impact their businesses and household. There is a one-year warranty and women have been able to use the warranty spending their time to take the lamp to get it fixed and their money on transport to ensure the lamps are in working order.

2. From previous studies on Millers & Grinders, it is apparent that women entrepreneurs make family decisions a priority at the expense of their businesses.

Access and Use

3. Drudgery and repetitive labour in the household limits women’s access to information. Having access to their own technology reduces these barriers and increases their access to information because they can make choices for themselves.

4. Owning a piece of technology like the Sun King boom reduces women’s household expenses (e.g., spending on batteries), allows her to save or spend this money elsewhere.

Agency and Rights

5. Early adopters who invested in the Sun King boom technology shared their testimonies with their peers which promoted the increased adoption by their peers. This shows peer to peer mechanism of dispersing information works well for women entrepreneurs. This further solidifies the rationale of the
nature of social capital and group development work as an underpinning logic around some women’s business activities.

6. Women like this technology more than other technologies that MEDA is promoting. It is costly compared to conventional lamps in the market, but women recognized the value of this lamp and are ready to pay more for this. One reason may be that women’s access to technology has multifaceted impact including social impacts (on the individual, household, and community), and economic impacts in their business, as the device allows a woman to provide for her family with light for children studying and phone charging.

**Just and Equitable Enabling Environment**

7. The devices have had a positive impact on Savings and Loan Groups, bringing women together to benefit from its multiple functions, and promoting peer to peer learning.

The initial research of the Nigeria WAY project found that women were mainly undertaking their processing activities without equipment and the level of drudgery was high. Devices like the Sun King Boom provide access to information, as well as light and mobile charging capabilities.

Women’s labour and productivity can be improved through increasing her ability to deliver on both her social and economic objectives. These two objectives are intertwined and rely on each other so supporting her childcare responsibilities and family environment as well as supporting her economic outcomes must go hand in hand.
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