

Partnership Impact Report

FLOUR POWER

The Impact of Women-Owned Solar Mills on Nutrition, Gender Equity, & Climate Action

Written by Agsol, in partnership with Welthungerhilfe

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Project Overview

In the rural counties of Kitui and Tana River, a quiet revolution is taking place. Through a partnership between Agsol and Welthungerhilfe (WHH), solar-powered grain mills are transforming how rural communities access food, energy, and opportunity. This initiative is empowering 500 women in business and is delivering **3.5 million nutritious meals per year**, all while reducing carbon emissions and saving thousands of hours of women's time.

This tells the story of how clean energy, community ownership, and women-led enterprise are driving a new model of rural development—one that is inclusive, sustainable, and ready to scale.

Impact Snapshot

- **22 solar mills in rural Kenya:**
17 women's groups & 5 schools
- **500+ women empowered** as solar milling entrepreneurs
- **450,000 kg flour/year** - serving **3.5 million nutritious meals**
- Group owned mills produce ~2 tons flour/mth - earning **\$115-150**
- Payback in **9-12 months**

Measurable Impact: Data-Driven Results

AgSol's MicroMills are equipped with **IoT technology** that tracks real-time energy and usage data, enabling transparent, scalable monitoring of impact. These digital insights, combined with manual data collection through quantitative surveys and in-depth interviews, reveal the measurable outcomes from 22 WHH-supported milling sites.

3.5 million wholegrain meals produced annually

\$25,000 in new revenue generated per year

1,400 households now accessing clean, affordable milling services

152,000 hours of women's time saved each year

23 tons of CO₂ emissions offset annually

These figures underscore the MicroMill's ability to **deliver nutrition, economic empowerment, gender equity, and climate action**—all from a single, solar-powered unit.

Data sources

- Remote monitoring units installed on mills (IoT)
- Manual reports from operators and schools
- Qualitative interviews

Key metrics

- Grain milled: 1 kWh = 65 kg flour
- Meals served: 130 gr/meal (WFP standard)
- Revenue: Group owned: 100% of kgs x KES 7.5. Schools: 30% of kgs x KES 5
- CO₂ offset: kg x 0.0536 CO₂ (IPCC Guidelines for National Greenhouse Gas Inventories)



The Challenge: Intersecting Crises

In Kenya, **nearly half of all children suffer from malnutrition**. Stunting affects 45%, and 13% are wasted, with long-term consequences for health, education, and economic productivity.

At the same time, rural communities rely on diesel-powered mills for their staple food production, which are expensive, polluting, and often located far from villages. **Diesel mills in Kenya consume 900 million litres of fuel annually**, emitting 2.3 million tonnes of CO₂. ([Cross Boundary](#), 2024.)

For women, the burden is especially heavy. **Women in Sub-Saharan Africa spend an estimated 40 billion hours per year** walking to and waiting at diesel mills—time that could be used for farming, childcare, or education ([CLASP](#)). And despite being central to food preparation, women are typically excluded from running milling businesses due to gender norms and the technical and physical demands of operating and maintaining diesel mills.



“Ideally, every village should have a modern, solar-powered mill fitted with a dosifier to mix vitamins and minerals into the flour.” — Global Alliance for Improved Nutrition ([GAIN](#))



The Solution: Solar Milling for Community Transformation

Agsol's MicroMill, which is recognised as the **world's most efficient solar-powered grain mill**, is purpose-built for off-grid, rural settings with women operators at its core. Agsol's vision is to democratise the staple food processing sector—a space dominated by unhygienic, inefficient and polluting diesel mills run by men. The MicroMill flips this dynamic.

Compared to traditional mills, Agsol's solar-powered mills are:

- Cleaner and safer, producing hygienic flour with a 65% longer shelf life
- More affordable, lowering milling costs by an average of 41%
- More inclusive, enabling women to step into roles as millers, entrepreneurs, and nutrition champions
- More sustainable, avoiding 1,700 tonnes of CO₂ emissions per 1,000 mills annually



Women-Led Enterprises: A Gender-Smart Business Model

Since May 2023, WHH have supported the installation of 22 solar MicroMills in East and Southern rural Kenya: **17 are group-owned enterprises, and 5 are in schools to support school feeding.** These mills do more than process grain: they fuel empowerment, enhance nutrition, and strengthen climate resilience.

Measurable impact of the women-led solar milling businesses:

- Over 500 women have become business owners through solar milling enterprises
- Women-led groups are reinvesting profits into livestock, savings, and community loan schemes
- Groups earn an average of ~16,000 KES/month, with 50% reaching over 20,000 KES achieving a payback within only 9 months



“The mill changed our group. The income gives us purpose, the flour nourishes our children.” —
Christine Musyimi, Kanini Kaseo Mother-to-Mother Support Group

At Agsol, gender inclusion isn't an add-on, it's embedded in the company's DNA. The MicroMill was **intentionally designed to be operated, owned, and led by women** to enable a new gateway of informal food processing—more food conscientious.

This model was recently validated by the GOGLA case study **Powering Progress for PURE**, which recognises Agsol as a leading example of how Productive Use of Renewable Energy (PURE) technologies can be tailored to meet women's needs while building sustainable, scalable businesses. ([Powering Progress for PURE](#)).



School-Based Milling: Fighting Classroom Hunger

Local milling of wholegrain flour has played a key role in improving child nutrition. In the five WHH-supported schools equipped with Agsol's solar-powered MicroMills, **1,220 children now receive daily wholegrain meals**—often their only meal of the day. Since school feeding began, administrators have reported **improved and sustained attendance**. With WHH's support, schools grow their own grains in kitchen gardens, with parents contributing seeds and labour.

Each on-site MicroMill can process enough grain to feed up to 2,000 students a day, slashing transport and milling costs while ensuring a steady supply of nutritious flour. After school hours, the mills also serve the local community, **generating new income for schools** and expanding access to clean, affordable milling.



“Since the Agsol Mill was installed, more families are eating wholegrain flour, contributing to the reduction of child malnutrition in the area—an outcome made possible through the combined impact of the mill and consistent nutrition education by community health promoters and mentor mothers.” — Sarah Masai, WHH Nutritionist, Kitui Field Office

Scaling the Model: A Call to Action

The Agsol-WHH partnership model is a **proven, scalable solution** tackling some of the toughest challenges in rural development: malnutrition, gender inequality, energy poverty, and climate vulnerability. This is more than a technology rollout, it's **food systems transformation**. With the right support, solar milling can unlock a future where rural women thrive as economic leaders, children are well-nourished, and communities are climate-resilient.

WHY IT WORKS

Community-Led

Multi-Sector Impact

Data-Driven

Financially Viable

Gender-Smart by Design

To replicate this success across Kenya and beyond, strategic investments are needed that are anchored in partnerships between NGOs, the private sector, and government.

- **Capacity Building:** Train women's groups in business skills, nutrition, and technical maintenance.
- **Market Development:** Strengthen local grain value chains and expand food fortification initiatives.
- **Policy Engagement:** Align with national school feeding and rural development strategies.
- **Capital Investment:** Deploy more MicroMills in underserved schools and communities.



About the Partners



A G S O L

Agsol

Agsol manufactures the world's most efficient solar-powered grain mills, designed for off-grid communities. Their mission is to replace diesel mills with clean, inclusive, and profitable alternatives that empower rural populations.



Welthungerhilfe (WHH)

WHH is one of Germany's largest private aid organisations, with over 60 years of experience in fighting hunger and poverty. In Kenya, WHH supports sustainable agriculture, food security, and innovation through partnerships with social enterprises like Agsol.





Flour Power: Real Impact Real Change

With thanks to Welthungerhilfe for their partnership in driving nutrition, gender equity, and climate action through solar milling in rural Kenya.

