

University of Chicago

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An independent study by UC Berkeley & the University of Chicago validated the efficiency & savings derived from the use of BURN's Jikokoa. Expanded highlights from the study:

Savings

- Consistent 39% (\$2.28/wk) savings through the lifetime of Jikokoa : “the stove reduces charcoal spending by USD 2.28 per week on average, or a decrease of 50 log points, which corresponds to a 39 percent decrease in charcoal consumption. Table A2 confirms that these results also hold for self-reported weekly charcoal spending during the endline survey. Using data from a pilot experiment conducted in Fall 2018, Figure A10 confirms that these causal impacts are stable over time, up to 18 months after adoption.”
- \$119 per year savings, NPV of \$178 for 2 years of ownership : “USD 2.28 per week—USD 119 per year—corresponds to on average one month of respondent income.⁶⁰ Net Present Value⁶¹ (NPV) after two years of stove ownership equals USD 178 per respondent, and is positive for > 99 percent of respondents.⁶”
- Lab stats for savings align with RCT field measurements, a first for cookstoves : “Our empirical estimate aligns closely with ex-ante engineering predictions. The stove manufacturers⁶³ previously estimated that the efficiency gain from the Jikokoa stove is 43–45 percent relative to a traditional Kenyan stove. Our point estimate is a 39 percent reduction with a 95 percent confidence interval of (30, 48). We therefore cannot rule out that the engineering estimates accurately predict realized savings. This is in contrast to extensive existing empirical work evaluating energy efficiency investments finding realized savings lacking when compared to engineering estimates”
- Savings are used for critical expenditures to improve quality of life : “More than 60 percent of respondents report using the savings for critical household expenditures such as food items and child school fees. This means governments looking to reduce poverty by increasing household adoption of profitable technologies may find that addressing market failures in the credit sector can provide tangible opportunities for welfare gains for poor households”

Return on Investment – Household

- Massive IRR (296% per year) : “Relative to a retail price of USD 40, these savings constitute an average internal rate of return (IRR)⁶⁶ of 24.7 percent per month, or 296 percent per year.⁶⁷ This is larger than almost all available alternatives.” Great stat for pitching to MFIs, as well as for investors

- IRR is order of magnitude higher than other interventions: “The IRR on the energy-efficient cookstove is an order of magnitude larger the IRR of most relevant alternative investments that are available to respondents in the domains of enterprise, agriculture, and education.”
- Jikokoa is the research-proven single best investment with the highest return that a Kenyan household can make: “Table 3 discusses existing estimates from the literature of alternative investments that are likely to be available to this population, including investments in healthcare and enterprises. We find very limited evidence that more profitable alternative investments exist.”

Return on Investment – Society/Environment

- Several valuable quantifiable benefits, including CO2 reduction, financial savings, and time savings: The most significant benefits from two years of ownership consist of avoided environmental damages in terms of greenhouse gas emissions (USD 229), financial savings (USD 214), 82 time savings (USD 256), and improvements in health outcomes.”
- Total return to society of \$699 for 2 years of use (i.e. >\$1000 for 3 yrs of use), vs a \$40 investment: “We define ‘private benefits’ to be the sum of financial savings and time savings. This equals USD 470. Finally, we define ‘total benefits’ to be the sum of private benefits and reductions in environmental externalities. The sum of these equals USD 699. Both of these sums vastly outweigh the retail cost of USD 40, suggesting a significant welfare gain to our participants.”
- Every \$1 of subsidy would generate \$20 in environmental and poverty returns. Good argument for further tax and fee reductions: “We estimate that, for a policymaker who is solely interested in poverty reduction and therefore only cares about private benefits, the MVPF is USD 14. When factoring in the avoided environmental damages, the MVPF increases to USD 20.”e. “Adoption of a stove then corresponds to on average a reduction of 5.5 metric tons of CO2e, valued at USD 229 over the course of two years.”
- Savings are used for critical expenditures to improve quality of life: “More than 60 percent of respondents report using the savings for critical household expenditures such as food items and child school fees. This means governments looking to reduce poverty by increasing household adoption of profitable technologies may find that addressing market failures in the credit sector can provide tangible opportunities for welfare gains for poor households”
- Research-proven argument for governments to subsidize/lower taxes on Jikokoa (every \$1 they reduce will create \$14 in returns, or \$20 in returns counting environmental benefits) : “We estimate that providing a USD 30 subsidy for the energy-efficient stove has an MVPF of USD 13.71 when factoring in the private benefits alone. This is a highly effective poverty alleviation program even for policymakers that are not concerned

with environmental externalities. When avoided environmental damages are included, the MVPF rises to USD 20.38.”

Health

- Quantified improvement in self-reported health : “Column (2) of Table 7 suggests stove adoption causes significant improvements in self-reported health.⁸⁹ Adoption of the stove causes a 0.56 standard deviation improvement in health.” & “These health benefits and high take-up rates (after relaxing credit constraints) stand in contrast to a large literature that generally finds that demand for improved cookstoves is low and inelastic to messaging around the potential health benefits”

General

- The Jikokoa’s improvement on previous cookstove technologies is likely attributable to the fact that the Jikokoa is incredibly easy to use and requires no learning. It does not require any behavioral change, which is what frequently caused changes in behavior and usage over time among modern cookstoves that have been studied in the past. It is more durable than traditional stoves, and on the rare occasion that the stove breaks down, adopters have access to free repair services provided in low-income areas across Nairobi.”
- Very high brand awareness : “More than 98 percent of respondents knew of the stove prior to the study.”
- Very high NPS/ recommendation rate: “Second, during the endline 99 percent of stove adopters say they recommend the stove to friends and family members, and fewer than 1 percent had ever considered selling it.”

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