From Innovations to Impacts:

Measuring longer-term impact on stakeholder goals

ETHOS 2021

Participants

Moderators

Dr. Nordica MacCarty, Assistant Professor, Evans' Scholar of Humanitarian Engineering, Oregon State University

Mike Hatfield, Program Director, StoveTeam International

Panelists

Ricardo Piedrahita, Berkeley Air Monitoring Group

Nuhu Amin, Assistant Scientist, icddr,b Dhaka, Bangladesh (Stanford collaborator in Rohingya camps in Bangladesh)

Thomas Thivillon, PhD candidate in development economics, PSL University

Olivier Lefebvre, Climate Solutions Consulting

Danny Wilson, Geocene

Gemara Gifford, Trees, Water & People

During the panel....

Each panelist will provide a 5-8 minute introduction

Following this we will open to Q&A and discussion

Please enter any questions you may have into the chat throughout the presentation and the moderators will select from those

BERKELEY AIR MONITORING GROUP

Recent Thoughts on Impact Evaluation

ETHOS

January 25th, 2021

Ricardo Piedrahita

Main Ideas

- Nationally Appropriate Mitigation Actions (NAMAs) are a growing area
- Impact measurement for NAMAs is flexible
- Our experience working in support of NAMAs in Peru through the Ministry of Energy and Mines

NAMAs

Nationally Appropriate Mitigation Actions

- NAMAs refer to any action that reduces emissions in developing countries and is prepared under the umbrella of a national governmental initiative.
  - CO_2, NO_2, CH_4 (as CO_2e) considered as the primary outcome
- NAMAs are country-driven projects/some overlap with Clean Development Mechanism
- Have potential in the household energy sector
- Monitoring, reporting, and verification (MRV) is flexible

NAMAs in Peru

Worked with Ministry of Energy and Mines (MINEM) on 3 studies within a NAMA Support Project funded by GEF and Peru

1. KPT evaluation on government-funded biomass stoves in 8 different regions (265 households)
    - Found varied results in terms of reductions of GHG throughout the communities and regions, and by stove types. Small control home sample size.
2. KPT pilot study of solar and forced draft stoves in 12 different regions (265 households)
    - Evaluated GoSun and Biolite stoves. Found higher adoption of the Biolitestoves, but never complete replacement of the traditional stoves.
3. KPT evaluation of recently built improved biomass stoves in 10 regions, 350 households (ongoing)

Human and environmental costs and benefits of firewood versus liquid propane gas for cooking in Bangladesh's Rohingya refugee camps

*Dr. Nuhu Amin, Dr. Laura Kwong, Chris LeBoa, Dr. Mahbub Rahman, Dr. Steve Luby

* nuhu.amin@icddrb.org

Outcomes

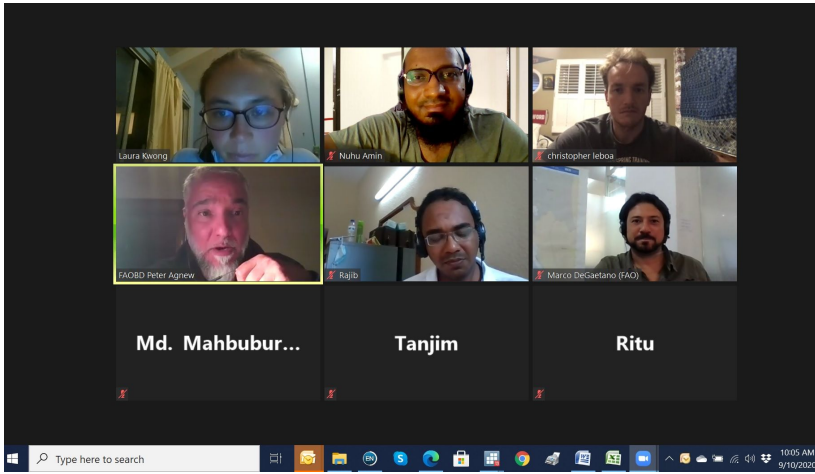
- Deforestation and elephant habitat -> satellite imagery
- Reliable cooking fuel -> stove use monitors
- Gender-based violence -> household surveys

Defining and measuring research impact

- Create a stakeholder engagement strategy
- High-level impact objective
  - Cooking fuel is distributed alongside food as part of basic emergency response package
- Research impact objective
  - Donors understand strong evidence for cross-sectorial benefits of cooking fuel distribution
- Our role and positioning
  - Third-party evaluators of the intervention

Target Stakeholders

- **Rt Hon Dominic Raab**, Secretary of State for Foreign, Commonwealth and Developmental Affairs, UK
- **Hon Karina Gould**, Minister of International Development, Canada
- **Kenneth J Hill**, Executive Secretary, U.S. Agency for International Development, USA
- **Qu Dongyu**, Director-General, Food and Agriculture Organization (FAO)
- **David Beasley**, Executive Director, World Food Program (WFP)
- **Dr. Kamal Uddin Ahmed**, Secretary (in charge), Ministry of Environment, Forests and Climate Change, Bangladesh



Stakeholders Engagement Plan

Stakeholder name or group	Intended change outcome	Starting stakeholder quadrant	Indicator/s of success at end of study	Sources of evidence for the indicators	Key themes of message (expected)	Preferred channels	Formats	Language	Messenger *(study team member)*
Rt Hon Dominic Raab, Secretary of State for Foreign, Commonwealth and Developmental Affairs, UK Hon Karina Gould, Minister of International Development, Canada	Expect to see: Recommend continuation of funding Like to see: Champion cooking/clean fuel within organization	Center (closest to work in alliance or partnership)	Email communication with 'champion' in which they discuss increased funding with supervisors Cites study results in their rationale of funding	Personal emails/records of meetings Joint Country Response plans/other funding documentation	Clean cooking fuel distribution addresses deforestation, energy, food security, physical security, host interaction, and mental health issues	Email Group video conference for presentations	Short briefs <2 pages Short presentations (<15 minutes), including video documentary on context and results (5 min)	English	Mahbub Rahman and Steve Luby will communicate with the Bangladesh country office representative, who will communicate with the target stakeholder
Kenneth J Hill, Executive Secretary, U.S. Agency for International Development, USA	Love to see: Earmarking WFP funds for cooking fuel provision or providing unrestricted funds	Develop interest, capacity	Contribution of any amount of money specifically for clean cooking fuel	Verbal/email confirmation	The most cost-effective strategy for distribution of clean cooking fuel is through WFP and to do this WFP requires unrestricted funds	Email Video conference for presentations	Short briefs <2 pages Short presentations (<10 minutes), including video documentary on context and results (5 min)	English	Steve Luby will communicate with the Bangladesh country office representative, who will communicate with the target stakeholder
Qu Dongyu, Director-General, Food and Agriculture Organization	Love to see: Recommend that WFP provide cooking fuel along with food in humanitarian situations	Develop interest, capacity	Documented recommendation from FAO to WFP	Recommendation memo	Distribution of cooking fuel addresses food security and the most cost-effective strategy for distribution of clean cooking fuel is through WFP	Email Video conference for presentations	Short briefs <2 pages Short presentations (<10 minutes), including video documentary on context and results (5 min)	English	Peter Agnew (of FAO) will communicate with the Bangladesh country office representative, who will communicate with the target stakeholder

Stakeholders Engagement Plan

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David Beasley, Executive Director, World Food Program	Love to see: Integrate provision of cooking fuel into provision of food in humanitarian settings	Develop interest, capacity	WFP commits to piloting integration of clean cooking fuel into food distribution	Verbal/email confirmation	The most cost-effective strategy for distribution of clean cooking fuel is through WFP and to distribution is feasible	Email Video conference for presentations	Short briefs <2 pages Short presentations (<10 minutes), including video documentary on context and results (5 min)	English	Geoffrey Sekei will communicate with the Bangladesh country office representative, who will communicate with the target stakeholder
Dr. Kamal Uddin Ahmed, Secretary (in charge), Ministry of Environment, Forests and Climate Change, Bangladesh	Like to see: MoEFCC supports and encourages continued LPG distribution in the Rohingya camp	Work in alliance or partnership	Reference the benefits of LPG distribution in public communications / meetings	Documentation of reference the benefits of LPG distribution in public communications/ meetings	Deforestation can be reduced by X km2 through distribution of clean cooking fuel	In-person meetings (with social distancing), if possible Video conference	Short briefs <2 pages Short presentations (<10 minutes), including video documentary on context and results (5 min)	Bengali	Mahbub Rahman and Nuhu Amin will communicate with the Bangladesh country office representative, who will communicate with the target stakeholder

LESSONS LEARNED FROM A RANDOMIZED EVALUATION OF THE DEMAND FOR LPG STOVES IN BURKINA FASO

January 2021

Thomas Thivillon – PSL University (Dauphine), LEDa, DIAL

Dauphine | PSL UNIVERSITÉ PARIS
LEDa UMR 8007-260
dial Développement Institutions Mondialisation

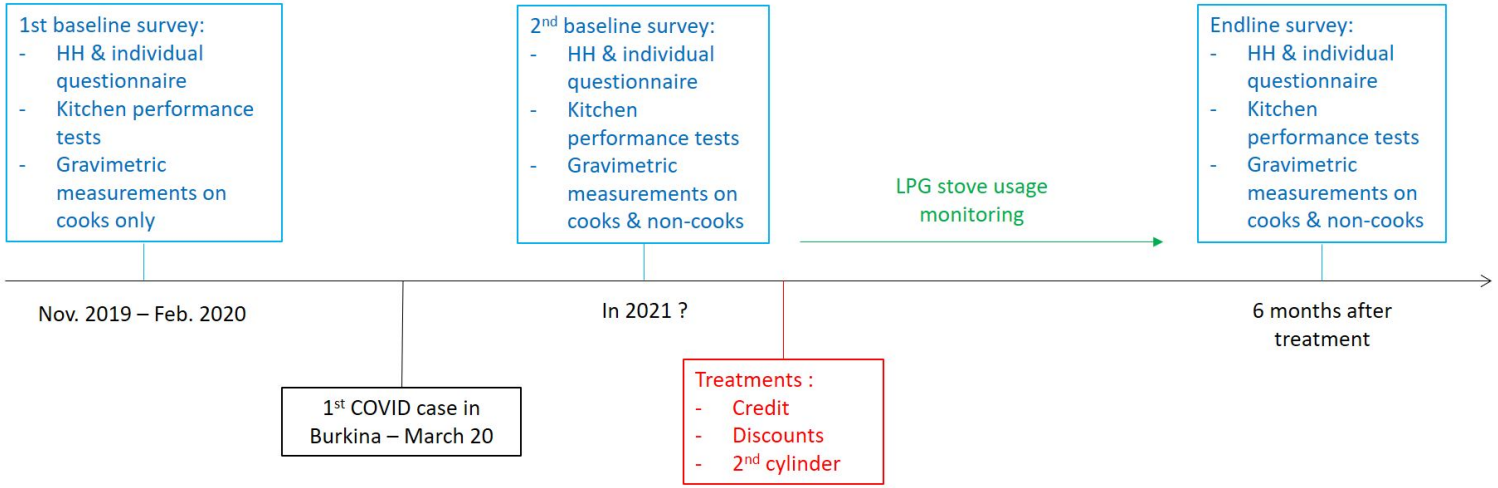
Background

- REDGAS : Randomized controlled trial launched in November 2019.
- Funded by French Development Agency (Agence Française de Développement, AFD).
- Implemented in partnership with Centre Muraz – INSP (Burkina Faso), Entrepreneurs du Monde (France), and IRD (Institut de Recherche pour le Développement, France).
- Assesses the impact of access to credit on LPG adoption, usage intensity, and ultimately exposure to $PM_{2.5}$.
- 830 wood-using households in three small cities of southern Burkina Faso.
- 24h gravimetric measurements of individual exposure to $PM_{2.5}$ among cooks and non-cooks before and after interventions (using Climate Solution's uPump).

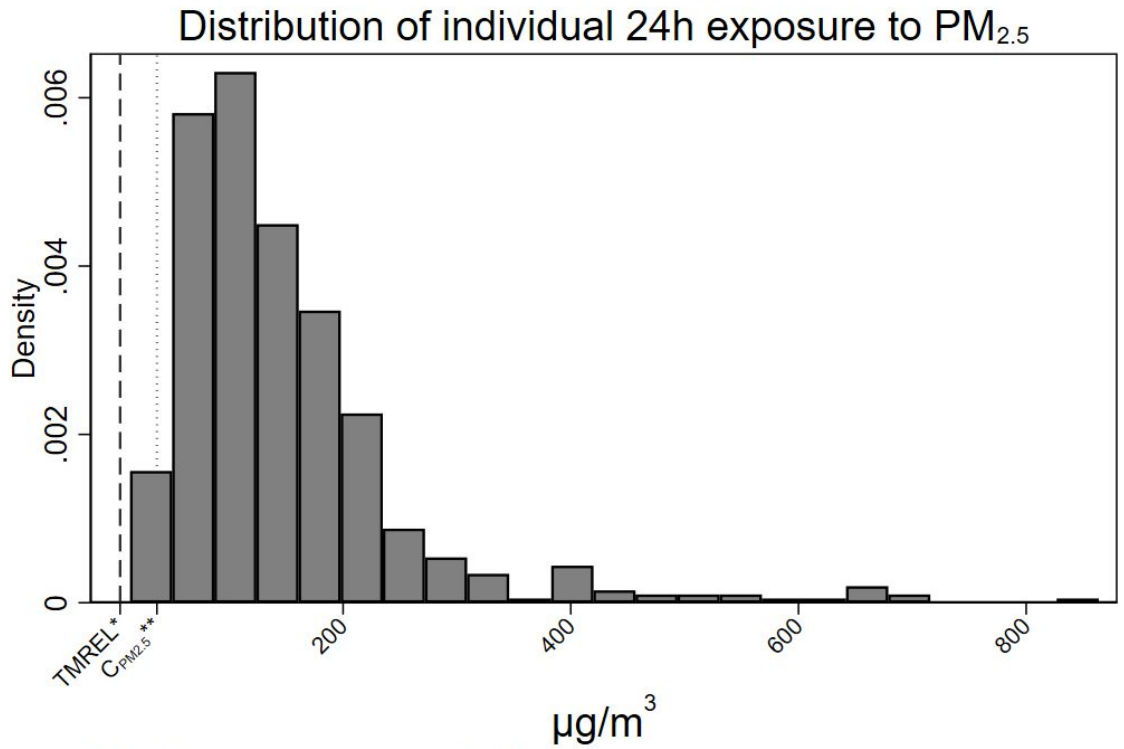
Treatments

830 households		**Price treatment**	
		25% discount	Market price
Credit treatment	Pay in 4 installments	1 cylinder / Optional 2nd cylinder	1 cylinder / Optional 2nd cylinder
	Pay cash	1 cylinder / Optional 2nd cylinder	1 cylinder / Optional 2nd cylinder

Data Collection



Preliminary Baseline Results



*: Theoretical minimum risk exposure level (4.2 $\mu g/m^3$)
**: Estimated average annual ambiant concentration in Burkina Faso (36.5 $\mu g/m^3$)

Some Thoughts

1. *Having a good counterfactual is as important as having good data:* it is hard to provide unbiased impact estimates with observational or pre-post designs.
2. *Aim for large sample sizes:* our best insurance against attrition, missing data, and ultimately low-powered studies.
3. *There is no cheap way:* don't start until you've secured a comprehensive, comfortable budget, including a large 'unexpected expenses' budget section.

CLIMATE
SOLUTIONS
CONSULTING

Measuring Impact

Olivier Lefebvre

Sensor-based measurements are often less intrusive than alternative measurement methods

- KPT vs FUEL
- Cooking time diary vs Stove Use Monitor
- Multiple visit vs long term sensor deployment

Measuring Impact is not enough

We need to understand the "Why?" behind the measured impact in order to make the right change to the intervention

For Instance, if the measured reduction of personal exposure to PM2.5 is not as good as expected

Underlying cause could be:

- Field emission of the intervention stove are higher than what lab measurements would suggest
- The residual use of dirtier stoves is still a major source of emission
- Other non cooking related sources are contributing significantly to the personal exposure of the cook.

Resulting change could be:

- Promote a different stove with better field performance
- Add a second stove to the intervention to target the cooking task still done on the dirty stove
- Address these other sources

1+1=3

In complex interconnected system, analyzing different sources of measurement together can provide insights that we would have missed otherwise.

1+1=3

- *PM sensor + stove tracker => sources of PM*
- *FUEL sensor + stove tracker => firepower*

GEOCENE

Danny Wilson, CEO
danny@geocene.com

I = PAS

Impact = Performance × Adoption × Scale

“We don’t get what we expect, we get what we inspect” - Kirk Smith

Inspect:

1. Unbiased (randomized and unobtrusive)
2. At meaningful scale (100s-1000s)
3. For meaningful durations (1-3 yrs)

Technology can help us inspect adoption in more unbiased ways, at larger scales, and for longer times.


Dot Details
Improved Stove 3
Suspended
Storage: 14% Full
Signal:
Battery:
Mission suspended due to loss of power
23.2°C
Current Temperature
Mission Name:
Unknown
Sampling Interval:
0 min 3 sec
Notes:
The temperature seems to be quite a bit lower than expected.
Tags
No tags
Campaigns:
N/A
Download
Restart Suspended Mission
Stop Suspended Mission
GEOCENE

DASHBOARD

Adoption Overview

Last Refreshed **3 minutes ago**

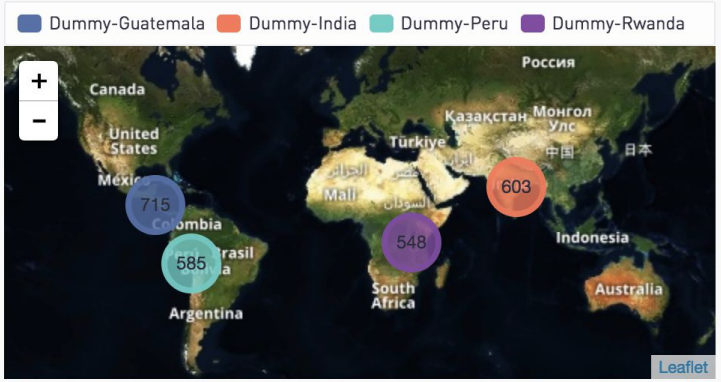
NEW CHART

FILTERS (1) **DateRange** 90 Days

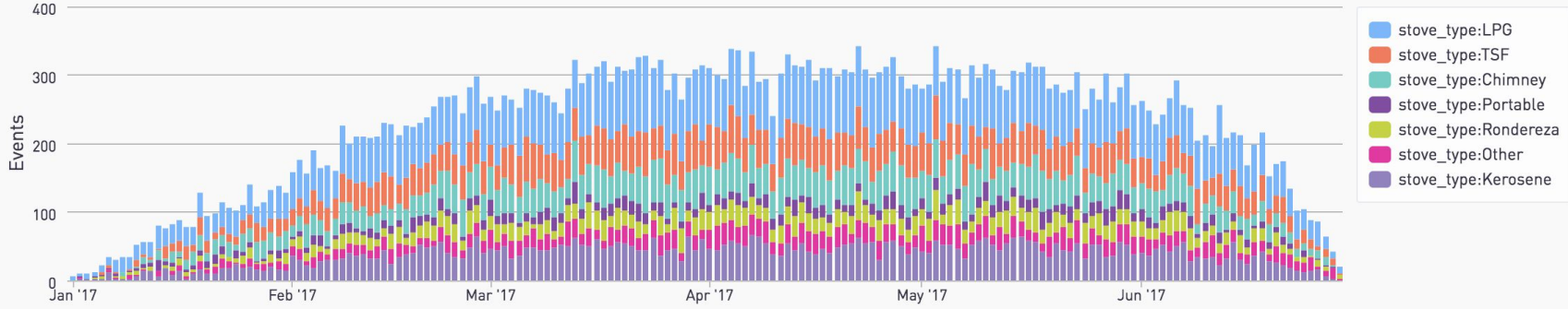
Cooking Activity in Filtered DateRange

	HOUSEHOLD	STOVE	COOKING HOURS	COOKING EVENTS
1	household_number:0001	stove_type:Chimney	0.35	0.42
2	household_number:0001	stove_type:Chimney	0.74	0.90
3	household_number:0001	stove_type:Kerosene	0.48	0.60
4	household_number:0001	stove_type:LPG	1.06	1.19
5	household_number:0001	stove_type:Portable	0.26	0.41
6	household_number:0001	stove_type:Rondereza	0.24	0.33
7	household_number:0001	stove_type:Rondereza	0.42	0.52
8	household_number:0001	stove_type:Rondereza	0.48	0.54
9	household_number:0001	stove_type:TSF	0.83	1.08

Locations of Connections to Dots



Events vs. Time



Macro Patterns

1. LPG, LPG, LPG
2. More research on willingness to pay
3. First hints of corporate social responsibility work

The Future of Biomass Cookstoves in Honduras: Public Health & Community Development Perspectives

TREES, WATER & PEOPLE

Helping people and the planet

Gemara Gifford, International Director, TWP
www.treeswaterpeople.org

Justa Stove 1999 -2019

TREES, WATER & PEOPLE
Helping people and the planet

Aprovecho Research Center

ASOCIACIÓN HONDUREÑA PARA EL DESARROLLO AHDESA

Participatory Design

Designed for rural cooking customs in Honduras

- *Local materials and labor and co-investment*
- *Griddle cookstove with chimney*
- *"Rocket" Combustion Chamber*
- *Built-in cookstove*
- *Manufactured technical components*

Photo by Joanna Pinneo, National Geographic

Justa Stoves Meet WHO Air Quality Guidelines

M.L. Benka-Coker, B.N. Young, J.P. Keller et al.

Table 3
Percent of personal $PM_{2.5}$ 24-hour samples below the World Health Organization's 24-hour air quality guidelines and interim targets.

	Traditional		*Justa*	
	Dry season	Rainy season	Dry season	Rainy season
AQG, 25 μg/m³	5.9%	10.4%	16.4%	36.1%
IT-3, 37.5 μg/m³	10.9%	19.6%	40.5%	53.0%
IT-2, 50 μg/m³	17.7%	21.7%	50.0%	63.9%
IT-1, 75 μg/m³	45.9%	54.8%	77.7%	74.3%

AQG: air quality guidelines, IT: interim target, $PM_{2.5}$: fine particulate matter.

UN WHO Air Quality Guidelines (AQG)

NIH + Colorado State University
2015 – 2020

La Esperanza, Honduras