

***Black Carbon:
When the Rubber Hits the Road***

V. Ramanathan

***Scripps Institution of Oceanography
University of California at San Diego
&***

CCAC Science Advisory Panel

***Climate and Clean Air Coalition Scientific Advisory Panel
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From Knowledge to Action:

Metrics for providing climate credits to rural women in India

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Wireless sensors linked to climate financing for globally affordable clean cooking

Tara Ramanathan¹, Nithya Ramanathan^{1*}, Jeevan Mohanty², Ibrahim H. Rehman², Eric Graham¹ and Veerabhadran Ramanathan³

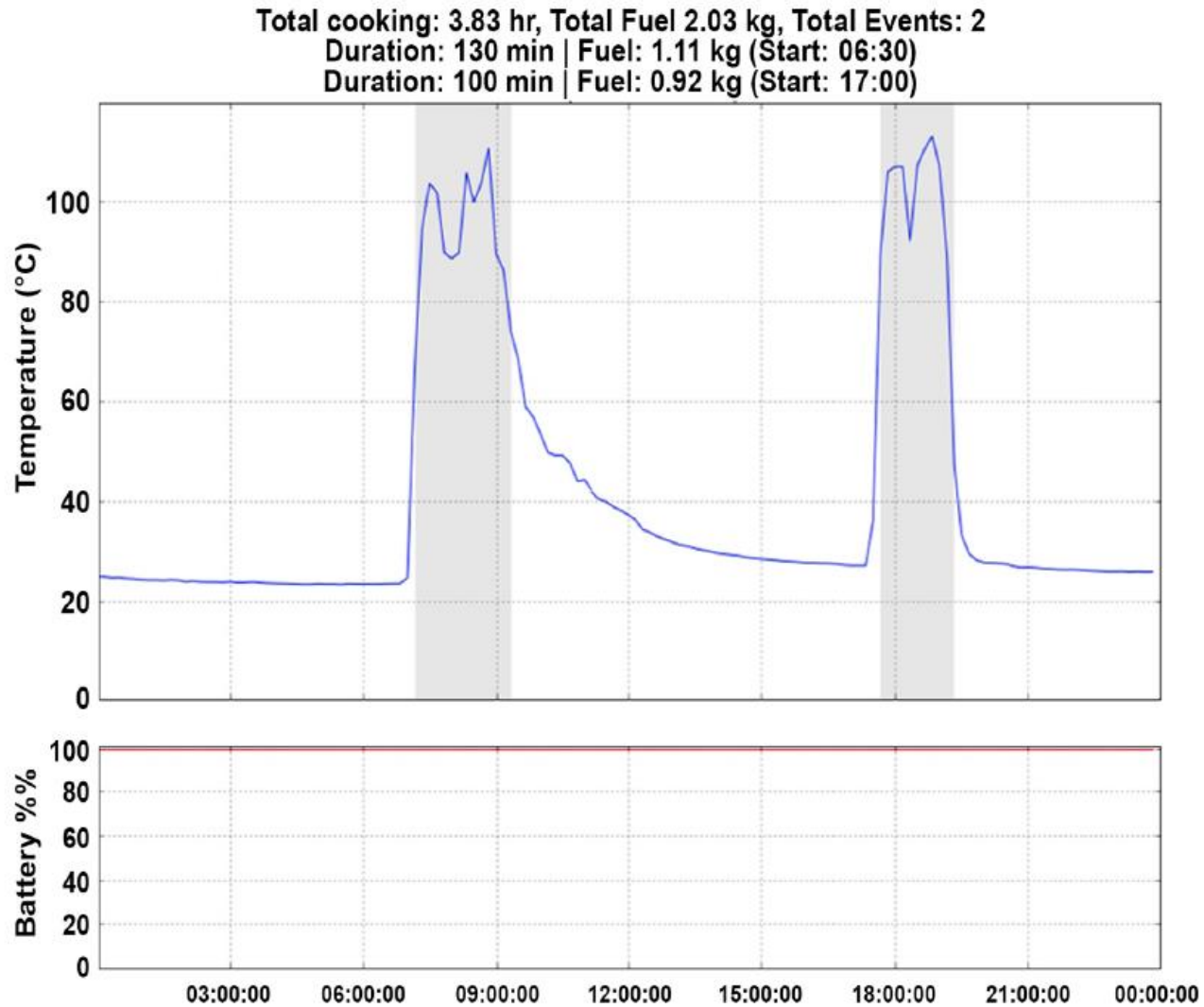
Project Surya

- *Provided climate credits individually to 4038 homes in N. India*
- *Installed wireless sensors in 456 homes*
- *Women took loans to buy the stoves and used climate credits to pay off the loan*

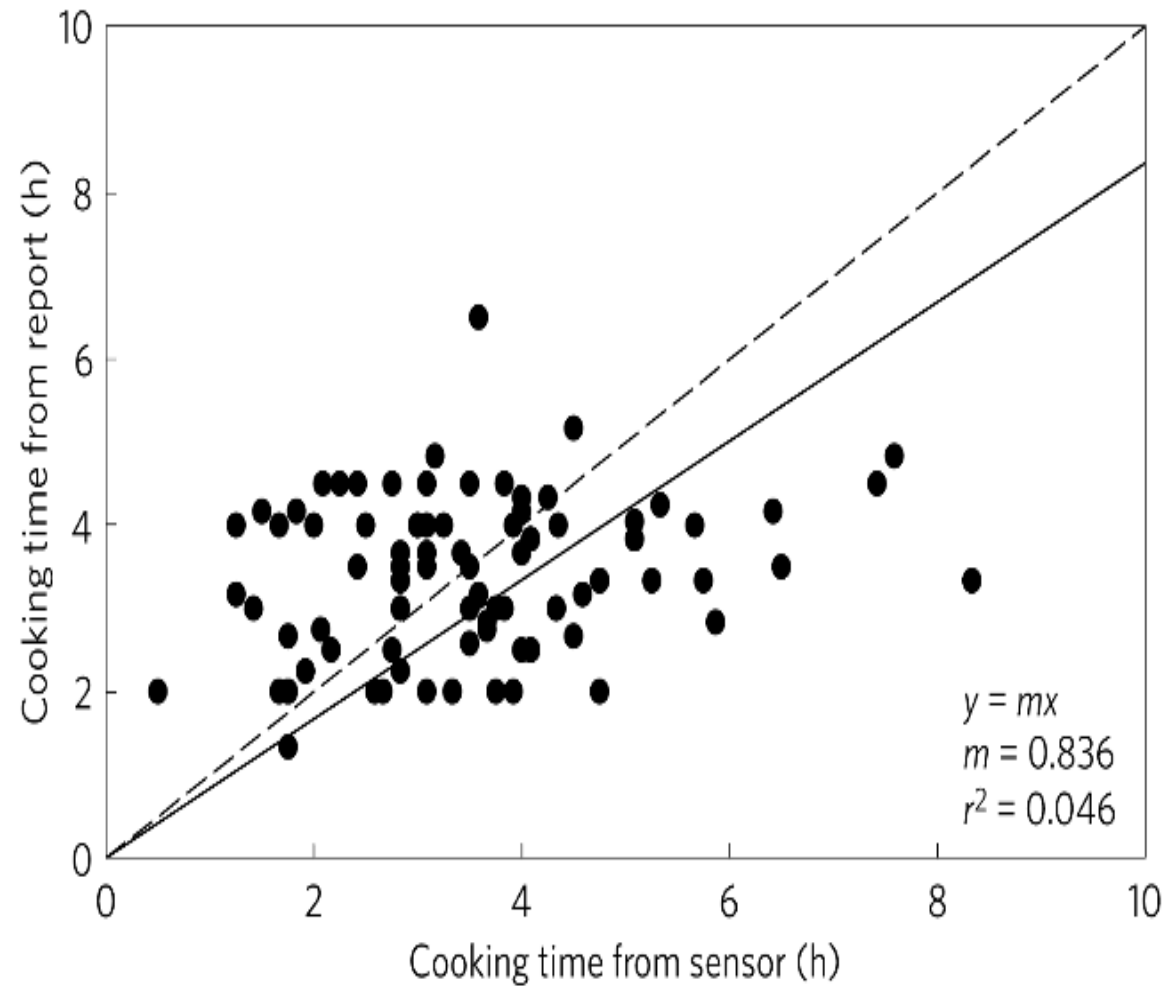
The “Smart” Stove



Determination of cooking time with the thermal sensor

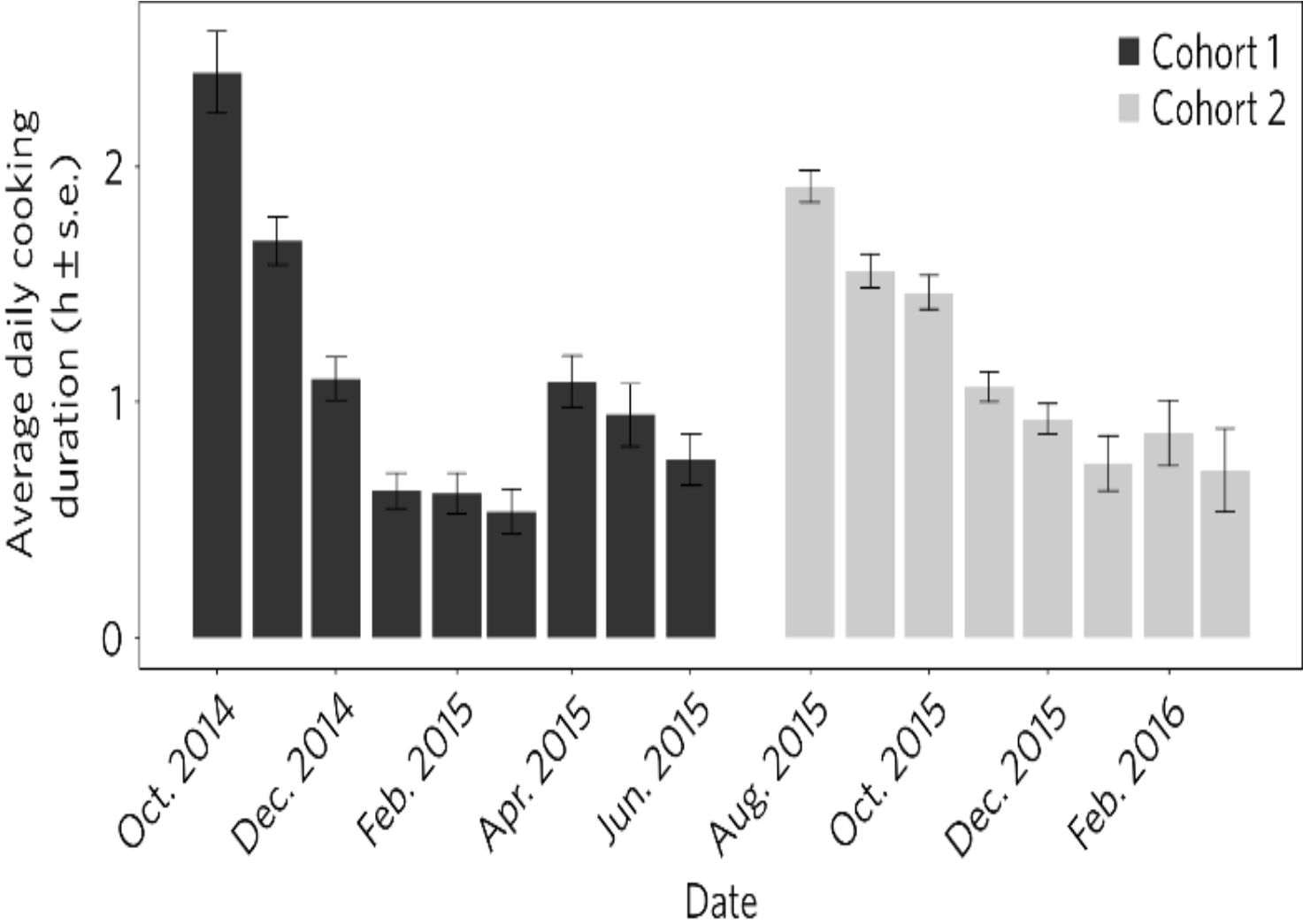


Self reported cooking time had no correlation with actual cooking time reported by the sensors.



Ramanathan et al, 2016

Climate Financing To Individuals Incentivizes Adaptation



The sensor determined mitigation was four times less than the potential (projected) mitigation.

Table 1 | Projected versus actual mitigation of the programme.

	Projected	Actual
ICS_FD cooking duration (h)	380,250 h	92,289 h
SLCP mitigation (tCO _{2e})	739 tCO _{2e}	182 tCO _{2e}
CO ₂ mitigation (tCO ₂)	380 tCO ₂	90 tCO ₂
Total mitigation (tCO _{2e})	1,119 tCO _{2e}	272 tCO _{2e}

Ramanathan et al, 2016

Rate of non-renewable wood consumption:

Mud Stove : 1.06 kg hr⁻¹ ; Smart Stove: = 0.47 kg hr⁻¹

100% use of Smart Stove Can:

- ***Save 1.8 tonnes of non-renewable woody biomass annually.***
- ***Mitigate 2.3 (30%) kg of BC yr⁻¹***

India-Specific 40 Year GWP(BC; OC; CO) is 1500 (700 to 2100).

Uses Streets, Shindell and IPCC-AR5 forcing values.

BC/OC/CO climate mitigation: 3.5 (1.5 to 5.9) tCO₂e yr⁻¹.

Climate Credit : \$6/ton of CO₂ equivalent

If a woman used the smart stove for all her needs, would have received \$35/year (about half the cost of the stove).

See Supplements of Ramanathan et al for details

Lessons learned

Rewarding individuals for behavioral change is important

For climate protection, monitoring the use of clean technologies on an individual basis is critical

Adequate supply chain to distribute and maintain technologies can significantly improve adaptation