

EXECUTIVE SUMMARY:

The Use of Behaviour Change Techniques in Clean Cooking Interventions to Achieve Health, Economic and Environmental Impact

A review of the evidence and scorecard
of effectiveness



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Table of Contents

EXECUTIVE SUMMARY	06
PART 1 INTRODUCTION	11
Clean cooking	11
Behaviour change	13
Behaviour change and clean cooking	15
PART 2 LITERATURE REVIEW	16
Definitions and structure	16
Methods	21
Results	24
PART 3 CASE STUDIES	27
Scorecard of behaviour change effectiveness	27
PART 4 DISCUSSION AND CONCLUSIONS	31
Analysis of the literature review and case studies	31
Lessons from other sectors	33
A behaviour change framework for clean cooking	34
Journey to scale	36
Limitations	39
PART 5 RECOMMENDATIONS	39
Policy and interventions	39
Further research	42
REFERENCES	43
APPENDICES	
Appendix A Behaviour Change Technique Groups	A06
Appendix B Literature search process	A08
Appendix C Behaviour change background	A10
Appendix D Case Studies	A14
1. Cambodian Fuelwood Saving Program: Geres	A15
2. China National Improved Stove Program: Ministry of Agriculture	A23
3. Energising Development Kenya Country Program (EnDev): GIZ	A30
4. India Room to Breathe: Shell Foundation	A36
5. Indonesian kerosene to LPG conversion: Pertamina	A44
6. South Africa Northwest Province Behaviour Change Study: University of Witwatersrand	A51
7. Strategies for Improved Cookstove Adoption in Rural Uganda: Impact Carbon	A57
Appendix E Scorecard of behaviour change effectiveness	A64
Appendix F Case study strength of evidence assessment	A66
Appendix G Full list of interventions	A70

List of tables and figures

TABLE 1	Clean Cooking Outcomes	17
TABLE 2	Clean Cooking Interventions	18
TABLE 3	Clean Cooking Behaviour Change Techniques	20
TABLE 4	Literature Sources	22
TABLE 5	Results of Literature Search Grouped By 'Impact' and BCTS	26
TABLE 6	Case Study Interventions	28
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FIGURE 1	Prisma Diagram of Search Process	23
FIGURE 2	Clean Cooking Intervention Framework	35

Acronyms

3ie	International Initiative for Impact Evaluation	HBM	Health Belief Model
AusAID	Australian Agency for International Development (now DFAT)	IAP	Indoor Air Pollution
BCT	Behaviour Change Technique	IAQ	Indoor Air Quality
CDC	Centers for Disease Control	ICF	International Climate Fund
CSI	Clean Stove Initiative (Indonesia)	ICS	Improved Cookstove
DECC	Department of Energy and Climate Change (UK)	IDBP	Indonesia Domestic Biogas Program
DEFRA	Department for Environment, Food and Rural Affairs (UK)	ISO	International Standards Organization
DFAT	Department of Foreign Affairs and Trade (Australia)	IWA	International Workshop Agreement
DFID	Department for International Development (UK)	LPG	Liquid Petroleum Gas
DOI	Diffusion of Innovation (Theory)	NISP	National Improved Stove Program
ESMAP	Energy Sector Management Assistance Program (World Bank)	PATH	Program for Appropriate Technology in Health
EU	Expected Utility	QRG	Quality Review Group
EV	Expected Value	RtB	Room to Breathe (Program)
FCO	Foreign and Commonwealth Office (UK)	SCT	Social Cognitive Theory
FOAM	Focus, Opportunity, Ability and Motivation	TLUD	Top-Lit Updraft (Stove)
GACC	Global Alliance for Clean Cookstoves	TPB	Theory of Planned Behaviour
GCEP	Global Village Energy Partnership	TRA	Theory of Reasoned Action
HAP	Household Air Pollution	TTM	Transtheoretical Model (of Change)
		USAID	United States Agency for International Development
		WHO	World Health Organization
		WTP	Willingness to pay

EXECUTIVE SUMMARY

Despite decades of effort, around 2.8 billion people worldwide still rely on solid fuels such as wood, dung and coal to meet their basic domestic energy needs.^[1] This places strain on economies, human wellbeing and the environment. The use of solid fuels – exposing people to smoke from cooking – is the fourth most significant risk factor for disease in developing countries, causing four million premature deaths in 2010.^[2] What people do, i.e. their behaviours – for example, which cooking method and fuel they use; where they burn fires; how they use ventilation; and where children and adults are located – affects quality of life and can contribute to climate change.

The aim of this study was to review the use of behaviour change approaches in clean cooking interventions in resource-poor settings. Using publicly available data, the report synthesises the evidence of the use of behaviour change techniques (BCTs) for human and environmental outcomes and impact. The report includes a set of case studies on selected interventions that use BCTs and applies a scorecard to assess the effectiveness of each intervention's approach to behaviour change. The report then discusses the findings from the review and case studies and includes a set of recommendations for the clean cooking sector to consider. A planned task was to compare interventions through an economic return on investment (cost-benefit) lens, however the availability and consistency of data did not make this possible.

Clean cooking

06 Use of solid fuels on open fires or inefficient stoves causes high levels of household air pollution (HAP), resulting in harm to health. Much of the burden falls on women and children. Solid fuels can comprise a significant proportion of expenditure for poor households and contribute to environmental problems, including climate change and deforestation. Clean cooking solutions are the clean cookstove technologies, fuels, equipment, and practices that address the health, economic and environmental impacts associated with inefficient, dirty and dangerous technologies and practices. Early on the sector focused on technologies, but in time complementary approaches were applied, including participation, user-centred design and “bottom of the pyramid” marketing. Thanks to more rigorous and widespread testing, the impacts of technologies are better understood. Despite a drop in the proportion of households relying on solid fuel from 62% in 1980 to 42% in 2010,^[1] the actual number of households has changed little because of population growth. However, while this study examines case studies that have achieved some success, the required level of sustained, correct use of proven technologies to attain real benefits has not been widely achieved. The sector still needs to find ways to achieve success at greater scale.

Behaviour change

Behaviour change approaches have been applied to many public policy issues, with the ultimate aim of changing human behaviour. Approaches are wide ranging, including marketing, removal of financial barriers, community mobilisation and regulation. Historically, many interventions have been based on rational models of behaviour and scientists are now beginning to understand the primacy of non-rational, or affective influences on behaviour. There has also been a move toward multi-level models – addressing individual, interpersonal, community and national change – based on

evidence from issues such as HIV/AIDS, sanitation and reproductive health. One of these, social marketing, includes the concept of “exchange” (cost versus benefit) that underpins the relationship between the consumer and a brand. Some agencies have developed their own tools with common foundations, including the World Bank’s ‘SaniFOAM’ framework for sanitation behaviours^[3] and PSI’s ‘Bubbles’ framework^[4]. The evidence for the effectiveness of behaviour change approaches is growing from a strong base, including with more effective ways of measuring results and impact.

Behaviour change and clean cooking

Cooking practices in kitchens involve complex, long-practiced behaviours that present a significant barrier to the success of clean cooking interventions. Until recently, the application of behaviour change in the clean cooking sector has been largely limited to adoption of new technologies and addressing related practices such as location of cooking or changes to fuel preparation. The clean cooking literature seldom used the theories and language of behaviour change. More recently, a 2014 review found that behaviour change strategies reduced IAP exposure by 20-98% in laboratory settings and 31-94% in field settings, albeit with weak evidence.^[5] There is also a strong body of evidence developing around the determinants, or factors, that determine the barriers and benefits to behaviour change in the clean cooking sector. While several strong interventions have been identified through the review process, many would have been missed if too narrow a definition of “behaviour change approach” was applied. Therefore this study focused on behaviour change techniques (BCTs) as the building blocks for behaviour change.

Literature review

The literature review set out to answer the question of how BCTs have been used in clean cooking interventions aiming to achieve human and environmental impact. The team conducted a robust literature search of published, peer-reviewed literature supplemented with unpublished (grey) literature. The decision to include the grey literature, while compromising the strength and consistency of evidence used, was considered important to cover the breadth of work. The search process yielded 48 sources of data, which documented 55 interventions related to all aspects of the clean cooking value chain – 32 in Asia, 15 in Africa and 8 in the Americas – with a total of 20 countries covered.



Woman with baby while cooking on an open fire in Guatemala. Photo © N. Bruce

Table 5: Results of literature search grouped by 'Impact' and 'BCTs'

n = 55	Category	Interventions n (%)
Impact	Economic	37 (67)
	Health	32 (58)
	Environmental	20 (36)
Behaviour Change Techniques	Shaping knowledge	47 (86)
	Reward and threat	35 (64)
	Social support	35 (64)
	Comparisons	16 (29)
	Identity and self-belief	15 (28)
	Regulation	15 (28)
	Changing the physical environment	10 (18)
	Goals, planning and monitoring	3 (6)

Case studies

The table below provides the list of interventions selected for inclusion as case studies, chosen to reflect a range of important and interrelated factors: geography, scale, implementer, funder, scope, impact, and BCT. Each includes an overview of the intervention with a focus on the use of BCTs and a 'Scorecard of Behaviour Change Effectiveness'. The Scorecard consists of benchmark criteria for an effective behaviour change intervention, drawing on existing scorecards and frameworks.^[44-46] The criteria were: 1) behaviour focus; 2) target population; 3) barriers and benefits; 4) methods; 5) capacity building; 6) behaviour change results; 7) outcomes; and 8) impact. Each case study includes scores based on eight criteria, each containing 2-3 questions. Each question was worth one point for a maximum possible total of 22 points for each intervention, which was then converted to a percentage score.

Table 6: Case study interventions (summary)

Intervention	Lead Organisation	Score of Behaviour Change Effectiveness
Cambodian Fuelwood Saving Program	Geres	77%
China National Improved Stove Program	Ministry of Agriculture	64%
Energising Development Kenya Country Program (EnDev)	GIZ	86%
India Room to Breathe	Shell Foundation	73%
Indonesian kerosene to LPG conversion	Pertamina	86%
South Africa Northwest Province Behaviour Change Study	University of Witwatersrand	80%
Strategies for Improved Cookstove Adoption in Rural Uganda	Impact Carbon	82%

Discussion and conclusions

Analysis revealed a mixed picture of the use of BCTs in clean cooking interventions. The team could identify the BCTs and related activities, but the impact of the BCTs is difficult to establish due to a lack of credible and consistent data. There is limited variation in the BCTs used, which suggests that those more commonly used are considered more effective but this does not appear to be based on evidence. 'Shaping knowledge', 'reward/threat' and 'social support' appear more often and usually in combination. Shaping knowledge includes advertising or other promotion activities. The most common forms of rewards are economic ones, especially subsidies. Social support, especially in the form of change agents and cooking demonstrations, appear often. No interventions account for the influence of emotion and other subjective, affective experiences. Certain BCT groupings appeared less frequently that have been successful in other sectors, e.g. 'identity and self-belief'.

Behaviour change framework: the team developed a framework for clean cooking that places behaviour change techniques in relation to impact, outcome and intervention activities. Furthermore, the role of determinants as the enabling or limiting factors led the team to conceptualise them in a suggested clean cooking framework between the intervention and outcomes. Further work is needed on how to define and measure the effectiveness of a BCT as well as understand its relationship to other elements.

Journey to scale: the review and the case studies included programmes that achieved scale by reaching a "tipping point" where the new clean cooking technology became the norm. An example is Indonesia's transition to LPG, where the government learned from early problems by building a national regulatory framework and reaching out to change agents in beneficiary communities. Interventions should take into account relationships and context at the individual, interpersonal, community and national levels. The recruitment of change agents (especially as early adopters) and the use of cooking demonstrations, are key to success. Lessons from marketing demonstrate that the value of the product brand, both intrinsic and extrinsic, must be appealing and appropriate for the intended market, highlighting the importance of testing and piloting.

The lack of consistent and credible evidence limits the report's conclusions. However, the available material combined with evidence from other sectors enables a description of the elements that are more likely to ensure success in clean cooking interventions. Below are the team's recommendations for policy, interventions and research.

Recommendations

The following recommendations are based on the literature review and case studies produced for this report as well as evidence from behaviour change interventions in other sectors.

Policy and Interventions

1. Use of theories of change and behavioural approaches in strategies, plans and activities. This could be supported by a behaviour change implementation guide for clean cooking.
2. Ensure intervention activities operate on multiple levels – individual, interpersonal, community and national.

3. Use brands as an umbrella for different types of behaviours and consider joint investment in a category marketing campaign across different brands.
4. Make sure the product is appealing and appropriate: four quality signals are branding, pricing, physical features, and retailer reputation. These should be assessed in relation to the WHO guidelines on IAQ impact and the ISO IWA tiers of performance.
5. Engage change agents and use cooking and other product demonstrations to take impact to scale.
6. Improve knowledge management and research methodologies with a greater percentage of funding and consistent monitoring, evaluation and reporting of results, especially on behaviour change components.
7. Incorporate gender empowerment as an important and practical approach.

Further research

1. Refine the groupings of BCTs and test their validity.
2. Conduct rigorous evaluations using behavioural models and theories.
3. Further test the scorecard of behaviour change effectiveness.
4. Expand interdisciplinary research and learning between behaviour change specialists and clean cooking sector practitioners and policy-makers, including understanding the relationship between the context, determinants and behaviours.
5. Produce a general model of behaviour change for clean cooking.
6. Assess the role of behaviour change approaches in supporting big shifts in technology use.

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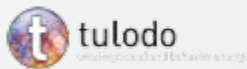


Woman cooking outside with BioLite stove Photo© N. Bruce



Woman cooking on improved chulha stove in India Photo© K. Jagoe

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