Participatory approaches for alleviating indoor air pollution in rural Kenyan kitchens

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Approches participatives et réduction de la pollution dans les cuisines en milieu rural kenyan
Une approche participative pour la diminution des émissions de fumée à l'intérieur des foyers a produit un impact positif à la fois en matière de réduction des émissions et d'amélioration de la qualité de la vie dans deux communautés rurales au Kenya. Les communautés ont été associées à toutes les étapes y compris la conception et le choix des équipements pour la réduction des émissions. Des réductions de l'ordre de 75 % et de plus de 60 % ont été possibles respectivement lors de l'utilisation des hottes et des techniques de ventilation. Par ailleurs, d'autres avantages y sont associés comme les économies d'énergie, meilleur confort, prestige social et meilleures relations familiales.

Introduction

How do we make sure that the impacts from a project are long-lasting and valued by a community? What factors will lead to really successful outcomes? We may think we know best – but if complete outsiders came to our kitchens and started telling us the best way to organize them, would we welcome them and heed their advice? – even if it proved completely irrelevant to the problems which we knew were causing us inconvenience?

The participatory approach being adopted by ITDG works with communities, discussing with households the known scientific risks of indoor air pollution, and working with them to find solutions which both reduce smoke, and at the same time enhance the comfort and quality of their lives. By applying technical know-how to potential solutions identified by the community, acceptable technologies have been designed and proven to be effective.

Background

Around 80% of people in rural sub-Saharan Africa depend on biomass (wood, dung, crop residues) for domestic energy. There is mounting evidence that the resulting indoor air pollution increases common, serious health problems, and attempts to reduce this pollution have often failed due to lack of community involvement in developing appropriate, sustainable solutions. The ITDG Smoke Project has been working with 50 households in two rural Kenyan communities, using *participatory methods* to alleviate smoke pollution.

Two study areas were chosen: Kajiado where ITDG is involved in the Maasai Housing Project and in West Kenya where ITDG is working on the *Upesi* project. These two areas are totally different climatically and geographically, as well as culturally (lifestyles, cooking habits and house types).

Community participation

Community participation has been a fundamental component of this project. This is built on experience over many years which shows that the target community are best placed to express their own needs and to identify potential solutions which suit their cultural, social and economic needs. Indigenous knowledge has been highly valued throughout this work, and the community's (mostly women's) views and opinions have been listened to at all stages of the work (Figure 1).

Commons themes and principles in participatory methodology include an understanding of the following

- that the community is the main actor in any development initiative
- that the outsider's role is basically supportive to the local efforts
- that the development activities should be oriented towards needs as perceived by the community
- that the indigenous knowledge has an important role to play as a basis for action, support and strengthening
- that the key challenge is to tap the potential of interaction between indigenous knowledge and that of the outsiders.

Participatory activities

In this project, these principles were adopted by:

- involving women's groups in house selection
- empowerment of communities by making them aware of the risks associated with household smoke and enabling mechanisms for its alleviation
- carrying out baseline assessment of pollution and exposure, fuel use and house structure, which included questionnaires and discussions
- initiating discussions on ways of alleviating indoor air pollution through development and installation of interventions
- evaluation of changes in pollution and exposure, and community views of the process used, and acceptability and affordability of the interventions
- other key activities have included individual interviews, time activity studies and focus group discussions.

Benefits of participation

During the project, participation has helped the communities to understand some of the problems of smoke in their houses and, importantly, it has empowered women to be actively involved in formulating solutions for smoke alleviation.

Figure 1 The community's views and opinions have been listened to at all stages of the work (photo: ITDG East Africa)

Both men and women participated in technology development and appraisal, deciding on the appropriate option that suited them best. The final design and materials used for the interventions was determined by the women themselves and availability of materials. In this way, local skills were used and the interventions are well accepted, key factors in promoting future replication of the interventions in the area.

The community also provided labour, and contributed in cash and kind in all the activities undertaken by the project team. Group leaders from the community called meetings and discussed issues of concern and communicated the same to the project team.

Effectiveness of interventions

Unsurprisingly, the selection of interventions was different in each area.

Smoke hoods

In the early part of the project, only one or two women in Kajiado were willing to try smoke hoods to alleviate smoke (Figure 2). Once two had been installed, just over half the women in the Kajiado region elected to have them. Photographs of the smoke hood working convinced five of the women in West Kenya to choose them too. The smoke hoods have proved extremely effective in both areas, reducing the particulate levels to a fraction of their original levels – from a mean of 4383$\mu g/m^3$ to a mean of 1075$\mu g/m^3$. Likewise, the carbon monoxide levels in the room (another key indicator of indoor air pollution) fell from 48 ppm to 10.7 ppm.

Eaves spaces

These have proved popular in West Kenya where, although less successful than smoke hoods, they have been particularly successful in removing a large proportion of the smoke in those households which had suffered from very high levels of smoke prior to having eaves spaces installed. For example, increasing the size of the eaves spaces from small to large reduced the particulate levels from 2042$\mu g/m^3$ to 766$\mu g/m^3$ (the lower figures overall are because West Kenya does not have such high pollution levels). In Kajiado eaves spaces have not been adopted – it is difficult to get eaves-spaces cut into the tightly-woven and mud-smeared walls close to the roof.

Windows

The Maasai community in Kajiado were keen to have windows, which could be closed with a wooden 'door' at night. In West Kenya, the women wished to have windows enlarged and fitted with mesh and a 'door'. Although the measured reduction in pollution has not been great, women are aware that opening the window improves fire combustion, and in Kajiado the windows brought light into the houses for the first time. This has improved the overall quality of life immeasurably; various vectors of ill-health (rats, bedbugs, snakes, etc.) have been expelled, women talk of being able to do craftwork and housework when it is raining, men enjoy drinking beer in the kitchen, children do their homework.

Stoves

These were adopted only by the women in West Kenya, where there is a strong tradition of *Upesi* stove use. All those who did not have stoves prior to the project had them installed. Those using the *Upesi* stoves have

Figure 2 Woman cooking, using smoke hood installed in Kajiado (photo: Nigel Bruce)

Figure 3 Eaves spaces and Upesi stove installed in West Kenya (photo: Nigel Bruce)

experienced very little improvement in pollution levels but all have benefited from reduced fuel use, shorter cooking time, increased safety and ease of use. In Kajiado, none of the women wanted to have stoves installed, though some have a shielded fire rather than the more traditional three-stone fire.

Poverty impacts

The poverty impacts in the table reflect the observations made by the beneficiaries themselves – often during group discussions.

Discussion

Throughout the project, the community members, who are the main stakeholders, have held brainstorming sessions with the facilitators and have engaged in exchange visits to examine the interventions selected by others involved in the project. The post-intervention discussions have shown the communities to be overwhelmingly positive in their response to the interventions.

Limitations

These discussions have provided a chance to identify limitations, and to discuss ways in which improvements can be made.

One area is finance; although all the smoke-alleviating technologies have been developed in consultation with all the project stakeholders, the cost of smoke hoods, particularly, is higher than most women (in particular) can afford. In terms of assets within the Maasai community, it is the same cost as two goats. Two routes can be adopted to make the smoke hoods more affordable. The first is reducing the cost of raw materials; using scrap metal rather than new sheet metal; making some parts of the hood from clay etc. Another vital route is to promote the hood to men within the community – not in terms of improved health, but in terms of 'comfort'. Reflecting the comments of some of the women in the project – 'Men can drink their beer in the cool of the kitchen'.

Another concern is the temperature of the room when a lot of new openings have been made. This is more important when people are intending to sleep in the room. Providing a 'door' on the windows, and ensuring that the eaves spaces are no larger than is required to alleviate the smoke are two approaches to addressing this problem.

Ongoing community participation

The communities have continued to share their experiences and suggest how best the various technologies can be made appropriate for their households. The support of the owners of the households cannot be over emphasized since they have unstintingly offered their time and houses to help the study be successful. Looking into the future:

Figure 4 Women in Kajiado can do craftwork in the house (photo: Nigel Bruce)

- Some of the project families have already expressed a need for more interventions (windows and smoke hoods) in their main/living houses – this will provide employment for the artisans who have been trained by the project. The project women have requested training by the team on how to go about with dissemination of interventions where they will be acting as the key lead.
- Members of the women's groups who were not involved in the project have made representation that they had not been trained on indoor air pollution extraction techniques. They have suggested training local artisans (among the community members) to ensure sustainability.
- Neighbours of the women involved in the project feel that a bigger group needs to be targeted to meet the demands of the community – this will be addressed in future project work.
- The improvements have prompted several inquiries from neighbours of the household owners. One of the husbands, for example, has had many visitors inquiring about the chimney installed in his kitchen and the improved fire efficiency realized from the improved cook stoves.
- The Kenya office has used the national press to highlight the dangers of indoor air pollution, and to describe the project activities. It will now be seeking to inform the general public through this medium.
- Videos have been made in both regions, and these will be useful dissemination tools, allowing the women to discuss their own impressions of the changes which the interventions have made to their lives.
- The project has shared experiences with Institute of Cultural Affairs of Tanzania (ICA – TZ), that was developing a proposal working with the Maasai community in Tanzania.
- The smoke team is collaborating will the Maasai Integrated Development Partnership Project (MIDPP) on their Urban Livelihoods and Shelter (ULS) Programme.
- The project has worked with Cross-border Bio-diversity project

Table 1 Poverty impacts

Increased income and savings	Increased income through training of artisans to make and sell interventions Reduced kerosene use due to reduced need for lighting (quoted by one householder in Kajiado; 4 litres now purchased monthly instead of every two weeks by another) Reported savings in time and money spent through ill health and in hospitals with burns, coughs, eye and chest pains Reduced losses caused by attacks on domestic fowl by wild cats, due to grills/mesh on window Use of windows providing light have given household members more time to engage in other economic activities such as pottery, basket weaving, beadworking, collecting medicinal plants and leisure activities when weather unsuitable out of doors Food stays longer without spoiling Can find lost items
Health	Coughs, dizziness and chest pains relieved Reduced sweat and heat, so better sleep Less headache, malaise Reduction in aching eyes, tears and running nose Safer – smoke hood acts as a shield, preventing children and goats falling onto fire Snakes and rodents cannot hide in the house where there are windows
Improved comfort	Cooking is possible using daylight through the windows Less soot on walls, ceilings, hair, sheets, children's books, clothes Easier to wash the children and do the housework Fire cooks faster, is easier to light, uses less fuel and can use any type of wood with smoke hood, so faster to collect Can stay longer in the house (this allows tasks to be completed more quickly) Able to watch over calves through the windows Less smoke in room makes it more comfortable Improved lighting and visibility through window installation Less smells Fresh air circulation The hood prevents rain getting onto the fire when the roof leaks Men can drink beer in the cool of the house Led to the introduction of new ideas: e.g. creation of more space, improved fireplace, introduction of cupboards Food free from soot contamination
Empowerment	Women have gained confidence in decision making on house and kitchen improvement, intervention designs and installations They have organised group meetings on their own to discuss the indoor air pollution reduction benefits The beneficiaries have been empowered through involvement in design, development and production of desired interventions An increased confidence of project participants through participatory training was noted by the project staff Project participants at the community level have been empowered to disseminate project outputs through e.g. exchange visits, carrying out demonstrations and installing interventions (e.g. improved cook stoves) with their sub-contracted artisans who can install windows, chimneys and eaves spaces for interested households Improved children's grades at school, as they can work indoors
Prestige	Increased social capital; project women have reported more visitors in the kitchen and more willingness to welcome them The group members feel their status in the society has been raised as other community members keep sending requests to the respective representatives
Gender aspects	The project targets women and children but the whole family benefits. Both men and women were involved in the project at all levels Women have gained confidence through disseminating knowledge to their neighbours Husbands became supportive of their wives' initiatives when they realised how much the comfort of their kitchens' were improved Interpersonal relationships built up among the women as they worked on the project Spouses now spend more time in the kitchen in West Kenya, sitting by the fireplace while women work, and eating food there, provided the children have left

in their planning sessions, and has influenced the project to involve ITDG in the energy component on conservation of energy at Namanga Hill, Kajiado district.

- The project has liaised with the local office of AMREF.
- The project has influenced the Ministry of Health (MoH), Ministry of Culture and Social Services (MOCSS), and Maendeleo ya Wanawake (an organisation set up to empower and improve the status of women) to participate and to campaign for indoor air pollution reduction.
- Local leaders have been involved in indoor air pollution reduction campaigns.

On a wider front, ITDG has just embarked on a second project, this time working with communities in urban Kenya, a high cold region in Nepal and working with displaced persons in Sudan. It is hoped that the methodologies which proved so successful in the project described above can be adapted to work with communities in these regions to reduce the health impacts of household smoke over a wider geographic area.

None of this work could have taken place without the unstinting efforts of the field teams in both Kajiado and West Kenya, and the enthusiasm and cooperation of the households taking part in this work.