

Fuel-Efficient Stoves



WORKSHOP REPORT
El Fasher, North Darfur
25-26 September 2007



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Mission Statement

The Women's Commission for Refugee Women and Children works to improve the lives and defend the rights of refugee and internally displaced women, children and adolescents. We advocate for their inclusion and participation in programs of humanitarian assistance and protection. We provide technical expertise and policy advice to donors and organizations that work with refugees and the displaced. We make recommendations to policy makers based on rigorous research and information gathered on fact-finding missions. We join with refugee women, children and adolescents to ensure that their voices are heard from the community level to the highest councils of governments and international organizations. We do this in the conviction that their empowerment is the surest route to the greater well-being of all forcibly displaced people.

The Women's Commission for Refugee Women and Children was established in 1989 to address the particular needs of refugee and displaced women and children. The Women's Commission is legally part of the International Rescue Committee (IRC), a non-profit 501(c)(3) organization. The Women's Commission receives no direct financial support from the IRC.

All photographs by Erin Patrick, except p. 3, Gerald Martone

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Women's Commission for Refugee Women and Children

PART I: IDP Information-Sharing Workshop on Fuel-Efficient Stoves

El Fasher, North Darfur September 25, 2007

BACKGROUND

On September 25, 2007, a participatory workshop for 30 internally displaced women from all three el Fasher-area camps (Abu Shouk, As Salaam and Zam Zam) on the subject of fuel-efficient stoves (FES) was facilitated at the offices of the UN Office for the Coordination of Humanitarian Affairs (OCHA) by CHF and the Women's Commission/International Rescue Committee (IRC).

Participants in the workshop were selected by CHF and IRC based on their potential to be frank and open in discussions. UN and nongovernmental organization (NGO) staff attended the workshop only as observers and did not present questions or information directly. The workshop was facilitated in Arabic by IRC and CHF national staff to allow for free-flowing discussion.

The results, findings and issues raised during the participatory workshop guided the agenda for the subsequent information-sharing workshop on FES programming for FES service providers and other NGOs, UN agencies, government ministries and other interested parties. Participants were given the report from the IDP workshop in advance of the second meeting. That workshop was also held at OCHA and facilitated by the Women's Commission and CHF, on September 26, 2007.

The workshop reports are included below, in chronological order. Annexes 1 and 2 to the first workshop report, respectively, present:

Annex 1: Brief biographical informational on a few of the IDP participants who volunteered for individual interviews following the workshop (page 4); and

Annex 2: Talking points used during the IDP workshop (page 5).

WORKSHOP I: PARTICIPATORY WORKSHOP FOR IDP WOMEN

A. KEY ISSUES RAISED: FOR FURTHER DISCUSSION

[Please see also "Findings," below, for more details.]

- 1) Potential design changes to increase durability.
- 2) Camp coverage and actual usage – how to measure?
- 3) Livelihoods options – capital support for start-up costs?
- 4) True impact of FES on firewood collection/sale (and therefore protection).
- 5) Environmental impact of firewood harvesting – are FES programs reducing this impact?
- 6) How to increase acceptance of/willingness to try alternative fuels/fuel technologies?



B. FINDINGS

PART I: USAGE

Use of FES: Of the 30 participants, all but three used at least one type of FES. A small number reported using a metal stove in addition to the clay FES. Only the three participants who did not have an FES reported using a 3-stone fire. Participants reported that most of their friends and neighbors in the camps did have (and used) an FES.

Coverage: Workshop participants estimated the coverage of FES in each camp was as follows:

- Abu Shouk: Between 50 and 75 percent of households with FES were using them.
- As Salaam: Very few household have FES, but nearly 100 percent of those who do, use them.
- Zam Zam: Household coverage of FES is very arbitrary – some blocks have nearly full coverage; others none at all. Approximately 80 percent of the households with FES use them.

Durability: Certain types of FES can last as long as three years. The newer models, which incorporate a wire mesh in the design (to increase ventilation), last between seven months and one year, depending on how frequently they are used – the wire degrades quickly and may need to be changed as often as every three months. All materials required for making the stove are easy to find except for the wire mesh. Participants suggested that the stoves would be much more useful if the mesh were made stronger/lasted longer – the problem is clearly the mesh, not the stove itself. The clay walls are reported to be in good shape after long-term use (one or more years).

FES models: No participants seemed to have any stove models other than those designed/promoted by CHF, Relief International and Practical Action.

Length of use: Most participants had been using FES only since their arrival in the camp; many had been using them for only the more recent portion of their time in the camp. A few participants said they had used FES in their home villages. One participant, for example, said she had learned how to make an FES in the newspaper, and had made and used one in her home village (Tawila). The vast majority of participants, how-



ever, used a 3-stone fire in their home villages.

Cooking location: Participants reported cooking both indoors and outdoors, depending largely on weather conditions (i.e., they preferred cooking indoors if it was windy and/or rainy).

Cooking frequency: The vast majority of participants cooked three times per day, though a handful reported cooking two times per day. Assida is typically cooked twice per day; lentils and qisra, or sometimes soup, are cooked roughly once per day.

Other uses for FES: Participants reported using FES only for cooking, heating water and making tea.

PART II: COMPARISON WITH 3-STONE FIRE

Preference/reasons: All but three participants strongly agreed that FES were “definitely” better than a 3-stone fire (the three participants who disagreed did not have FES).

The key reasons why FES are considered better are (in order):

- Saves wood
- Avoids fires
- Protects children from burns
- Saves money (users do not have to purchase as much wood)
- Cleaner-burning (FES “keep the house and the cook clean”)

Quality/speed of cooking: All participants agreed the FES cook their food as well (in terms of taste) as a 3-stone fire. Most reported that the stoves cook food more quickly (in 15 minutes for a 2-3 person meal as opposed to one hour with a 3-stone fire).

Smoke: Most participants agreed the FES produces “much” less smoke than a 3-stone fire. With a 3-stone fire, the fire itself gets very hot, but the inside of the pot does not get as hot. The smoke produced from a 3-stone fire causes eye problems for women and children. Participants did not mention respiratory problems being caused by kitchen smoke, though this concern has been well-documented in other locations.

Safety: FES were reported to be “much less risky” than 3-stone fires; with much less risk of setting fire to fences and huts, because the fire is contained.

PART III: USEFULNESS/IMPACT

Training/knowledge transfer: Most participants agreed that they could and would make a new stove upon return to their home village (most would not bring the stoves with them during return because they are heavy and would break). The materials needed to make the stoves, except for the wire mesh, would be easy to obtain “anywhere.” Some participants said they had already trained their neighbors in the camps, and some reported teaching their relatives in surrounding villages how to make the stoves as well. Some participants agreed that making a new FES for a new bride would be a good gift.

Suggested design changes or other modifications: Nearly all participants agreed that the FES models which incorporate a wire mesh need to find a stronger material for the wire, as the current one degrades very quickly. Participants noted the stoves were heavy and likely to break if moved a lot (as during return, for example), but said it would be easy enough to make a new one. No other changes were suggested.

PART IV: FIREWOOD COLLECTION

Frequency of collection/purchase: Before using the FES, most women reported collecting wood between 5 and 7 times per week. With the FES, they said that they now buy all of the firewood

they need in the market. Only a few said they bought wood in the market before the introduction of FES. However, purchasing firewood is more common in Abu Shouk and As Salaam than in Zam Zam, since the area around Zam Zam is relatively more forested. Other reasons noted for leaving the camps besides firewood collection included employment in town and farming.

Role of men: Women said men would not collect wood because the men “would be targeted and killed” and because “they are too afraid.” The women added that the culture would not allow men to collect wood; that women did much more



work than men; and that men were often working in the towns during the day and would not have time to collect wood.

Price/sale of wood: There were varying responses about the price of one bundle of wood. Most participants suggested the price of a “large” bundle was 5 SDG (approximately \$2.50 – considered to be roughly the same price as a small cylinder of liquified petroleum gas (LPG)); a “small” bundle was 1 SDG (\$0.50). Participants reported purchasing between 2 and 14 bundles of firewood per week, depending on the size of their household (it was understood that 14 bundles would refer to the smaller bundles) – this would mean an average weekly expenditure of between 10 and 14 SDG (US\$ 5-7) on firewood. No participant said she sold wood, though most participants agreed that many IDP women do sell wood.

Environment: Most women said they cut living trees and dry the wood in their houses. All participants said the level of deforestation (and the distance they must travel to find wood) has increased since their arrival in the camps.

Charcoal: Some participants reported using charcoal in addition to firewood, mostly because it was “more efficient.”

PART V: LIVELIHOODS

Activities/options: Only a few participants were merchants or traders; one sold sorghum seeds. Participants noted that many women work in brickmaking. Other livelihoods activities in which participants engage are sewing and handicrafts. Without income, many participants said they sold up to 50 percent of their World Food Program (WFP) rations to earn money and/or to exchange for other food items. Some said they sold water. No participants said they made charcoal.

Selling FES in the market: Almost no participants said they would make FES to sell, since they were not convinced there was a market for the stoves

outside of the camp, and they did not have the necessary capital to begin such an operation. The few participants who did not already have FES were asked if they would purchase one; they replied they would not, since it was expensive (4 SDG [US\$ 2] with the wire mesh; 3 SDG [US \$1.50] without the wire mesh) and would be easy to make on their own. It remains unclear as to why they had not yet made/received one.

PART VI: ALTERNATIVES

General: Most participants had only one stove, and did not seem to show great interest in learning about or obtaining other models.

Other types of FES: A few participants said they had, or had heard of, “very good” metal stoves.

LPG: A few participants had or had heard of LPG canisters or other gas-based fuels, though many were concerned about the safety of such fuels, especially with regard to children.

Solar: No participants had heard of, used, or were interested in solar cookers.

ANNEX 1: BIOGRAPHICAL INFORMATION FOR SELECTED PARTICIPANTS, IDP WORKSHOP

Huda Yagoub Abdullah, 25, is a resident of Salaam camp. Her home town is Tawilla, North Darfur. She uses both a clay and metal stove in the camp, but does not use a 3-stone fire at all. Both stove models she uses have been promoted by CHF.



In Tawila, she also used an improved clay stove. She read about the stove in the newspaper and learned how to make it from the article. She used the stove for a long time – it worked well and stayed in good shape. The clay stove she has in as Salaam has also worked for a long time.

She was trained by CHF to make the stove model she currently uses. Since her training, she has worked as a volunteer trainer and trained many other women in the camp to make their own stoves.

Hawa Abaker Mussa, 40, is a resident of Zam Zam camp. Her home village is Tabit, in North Darfur. She currently uses the CHF-improved stove, which she has had for approximately three years, and finds that it still works well. She uses the stove model with the wire mesh that many other participants had complained about, but she is satisfied with her stove.



In Tabit, she had only used a 3-stone fire.

She was trained by CHF to make the stove she currently uses, and has since trained many others in the camp – mostly women who live near her in her camp block.

Hawa Soluman Mohamed, 15, is a resident of as Salaam camp. Her home village is Korma, in North Darfur. She currently uses the CHF-improved stove, which she has had for approximately one year. She has had to change the wire mesh once during that period, but the stove itself is still in good shape, and works well with the new mesh.



In Korma, she had only used a 3-stone fire.

She was trained by CHF to make the stove she cur-

rently uses – she learned how at the CHF center. She has not (yet) trained any other women to make the stove, but believes she would know how. She would definitely make a new stove once she returns to Korma, as she feels it is “very easy” to make the stoves.

Nazic Ibrahim Yagoub, 35, is a resident of Abu Shouk camp. Her home village is Korma, in North Darfur. She currently uses the CHF-improved stove, which she has had for three years. She has to replace the wire mesh every three months, but other than that the stove works well and remains in good shape.



In Korma, she had only used a 3-stone fire.

She has only just learned how to make the stove, at the CHF center. Because she is a new trainee, she has not yet trained anyone, though she is confident she would be able to make a new stove once she returns to Korma.

Khadija Ezeldin Ismail, 28, is a resident of Abu Shouk. Her home village is Gadara, in the Kebkebiyah region of North Darfur. She currently uses a clay stove, but not the CHF model – she’s not sure what agency had designed or promoted it. It does not incorporate the wire mesh that was talked about during the larger discussion.



The stove was given to her just before the recent rainy season (in May or June 2007) by an Umdah (a traditional tribal leader in Darfuri society). The stove is still in good condition, but she doesn’t like it because it produces too much smoke. With a good hut and a good kitchen, she would much prefer a 3-stone fire, because there is more ventilation that way.

In Gadara, she had only used a 3-stone fire.

Since the stove was given to her, she does not know how to make a new one. She has not attended any CHF or other trainings.

ANNEX 2: TALKING POINTS FOR IDP WORKSHOP [DIVIDED BY GENERAL ISSUES AND MORE SPECIFIC QUESTIONS]

NOTE: These talking points were devised by the Women's Commission with input from CHF and IRC in el Fasher. As discussed by the facilitators before the workshop, the questions contained herein were meant only as an internal discussion guide and as a means of keeping track of which issues had been discussed. The facilitators raised discussion topics and moderated the participants' discussion, but did not lead or encourage specific responses.

USAGE

- o Determine roughly what percentage of the group use FES, and which model(s).
- o For how long (weeks, months or years) have the workshop's participants been using FES?
- o Do they use any other cooking techniques in addition to their FES? (3-stone fire; more than one FES, etc.)
- o Do they prefer to cook inside or outside? How many meals do they cook per day?
- o For what other reasons/uses do they need fire/smoke?
- o How did they cook in their villages?

OPINIONS

- o Determine if the participants like the FES – for example, do they prefer it to a 3-stone fire? (If so, why? If not, why not?)
- o What do they like about the FES? What do they not like about the FES? What would they change about the stove if they could?
- o Does the FES cook their food well? (Do they like the way the food tastes when made on an FES?)
- o Does it cook at the same speed as a 3-stone fire, faster, or slower? Is the speed at which the FES cooks acceptable to them?
- o Does the FES produce as much smoke as a 3-stone fire, more smoke, or less smoke? Are they happy with how much smoke the FES produces compared to a 3-stone fire?
- o Do they feel FES is a safer way to cook? Why? Do they think their houses/children are less at risk from fire?
- o Do they consider the skill of stove-making a valuable skill? If so why? And how do they see putting

it to use (either in camps or after return)? If not, why not?

IMPACT

- o Determine the frequency/amount of firewood collection before/after obtaining an FES.
- o Determine where/how the participants obtain their firewood – do they collect it, purchase it or other?
- o If they purchase it – from whom? How many bundles do they purchase per week?
- o If they collect it – from where; how often (per week), and how long does the trip take (broken down by camp)? How many bundles do they collect per trip?
- o For those in the camps a long time: Is it more difficult to collect firewood now than a few years ago? In what sense?
- o Determine the various reasons for which the participants leave the camps other than firewood collection (employment; fodder collection; to obtain shelter materials; for trading, etc.)
- o Determine what change, if any, they think using an FES has made in their lives.
- o Do they earn income (from where?) or trade rations? How do they obtain food/condiments that aren't in their food baskets (vegetables, spices, etc.)?
- o Do they sell firewood in the market? Do they know of anyone who sells firewood in the market? What is the going price?
- o If they do sell firewood, how much do they earn? Do they know of other ways of earning income? Do they want to learn other ways to earn income?
- o Do any of them make or use charcoal? If they make it: do they sell it? If they use it: do they prefer charcoal to firewood? Why?

- o For those who have been trained to make FES – do they think they can make extra stoves and sell them? To whom? If not, why not?
- o Would they purchase a stove? If so, what type of stove (clay or metal)? How much would they pay for a clay stove? For a metal stove?
- o Do they think they will bring the FES with them when they return to their villages? If not, why not?

ALTERNATIVES

- o Determine the participants' awareness of other types of cooking technologies/cooking fuels. Do they use charcoal, for example? Have they used any other type of fuel (in the camps or at home)?
- o What type of fuel or cooking device would they like to have? Why would this device be better than FES?
- o Have any of the participants seen or used a solar cooker? If so, what did they think about the solar cooker?



PART II: Inter-Agency (Service Provider) Information-Sharing Workshop on Fuel-Efficient Stoves

El Fasher, North Darfur September 26, 2007

BACKGROUND

On September 25, 2007, a participatory workshop for 30 IDP women from all three el Fasher-area camps (Abu Shouk, As Salaam and Zam Zam) on the subject of fuel-efficient stoves (FES) was facilitated at OCHA by CHF and the Women's Commission/IRC.¹

The results, findings and issues raised during the participatory workshop (all of which are included in part one of this report; above) guided the agenda for the subsequent information-sharing workshop on FES programming for FES service providers and other NGOs, UN agencies, government ministries and other interested parties. Participants were given the report from the IDP workshop in advance of the second meeting. That workshop was also held at OCHA and facilitated by the Women's Commission and CHF, on September 26, 2007.

PART I: SUMMARY

A. RECOMMENDATIONS

KEY RECOMMENDATION

TARGET MESSAGES ON THE BENEFITS OF FES TO THE HOUSEHOLD LEVEL

All trainings on FES **must include a major sensitization component** for the community, whether displaced or non-displaced. The users must understand the specific benefits of the stoves in order to be convinced to use them over the longer term. For the users themselves, the **more tangible and relevant the benefits**, the more likely they will be to use, maintain and replace the stoves as necessary, whether in camps or after return (when there is likely to be closer and easier access to firewood than in camp settings, and thus more "competition" from the 3-stone fire).

The "bigger picture" issues of concern to the

humanitarian community are important and should be discussed through appropriate channels (the regional FES working groups and other UN/NGO coordination mechanisms, for example), but broad themes such as environmental protection and rehabilitation are unlikely to be as convincing to beneficiaries as the **individual household-level benefits**.

CHF noted that **youth centers** can serve an important role for disseminating messages about the benefits of FES. Training youth on the importance of FES, environmental protection, reforestation, health, etc., for example, can have a large follow-on effect throughout the wider community.

B. MESSAGING

Several themes and messages were thought to be important:

1. Household economy:

- FES will save users money, because they will consume less wood² – OR –
- FES is income-supplementing, as money otherwise spent on firewood can be used for other purposes³ – OR –
- FES trainees can make and sell extra stoves to earn income.⁴

2. Health/safety:

- Because the fire is contained and the heating mechanism insulated, children are less likely to be accidentally burned from touching or getting close to the fire.
- Because the fire is contained, FES present much less risk of fire caused by wind, sparks, etc., to structures in the camp.
- FES emit less smoke than 3-stone fires, reducing the likelihood of respiratory inflammations and eye problems, especially among children and women.

3. Nutrition:

- For those who may sometimes skip or undercook meals due to lack of sufficient fuel, FES can save enough wood to allow more meals to be cooked per day – lessening the risk of malnutrition.

Lastly, workshop participants agreed that it is also important that agencies with FES programming take a **unified approach to trainings and the discussions of benefits**, etc. If presented in a unified voice, the messages noted above are likely to have a stronger and **more sustainable impact** than the current varied messaging campaigns have been able to accomplish.

PART II: WORKSHOP PROCEEDINGS

A. INTRODUCTION – AGENCIES’ ROLES, INTERESTS AND BACKGROUNDS:

The workshop began with introductions from the participants, focusing on their interest in FES and/or alternative cooking fuel sources. Most FES service providers present at the meeting had begun stove programs for livelihoods and/or environmental reasons. One participating agency was interested in beginning FES programming (also for livelihood and environmental reasons), but had not yet begun a project and was interested in learning more. Representatives of the North Darfur Food Security and Livelihoods Working Group (chaired by the Food and Agriculture Organization (FAO)) and from the Government of Sudan’s Forestry Department also participated in the meeting.

As a means of introduction, several agencies discussed the background to their FES programming.

CHF: CHF focuses its work on three sectors – shelter, food security and livelihoods. Initially, CHF’s FES programming was intended to be a livelihoods activity, but given a perceived lack of markets for FES sale (more details below), they now concentrate on training on FES production as a skills-building activity for women, through CHF’s camp-based community centers. Their key focus is on training, though occasionally the need to produce large amounts of deliverables in order to meet donor targets necessitates that trained

artisans (that is, those who have shown the most skill during trainings) are employed by CHF to produce many stoves at once, for distribution to other households in the camps.

Over the past three years, CHF has tried three different models of FES in Darfur:

- a model promoted by the Intermediate Technology Development Group (ITDG; now called Practical Action);
- a different version of the ITDG stove, altered by a team from University of California-Berkeley and called the “Avi-3” or, more recently, the “CHF-improved,” to allow better ventilation and respond to some of the opinions expressed by users; and
- a version of a lightweight metal stove, called “Tara,” again developed by UC-Berkeley, and which will be mass-produced in a Nyala-based youth vocational center. CHF currently has a 5,000 stove distribution target.

Forestry Department: Within the Government of Sudan, the Forestry Department is responsible for the protection of forests, replanting and general environmental conservation. Also within their mandate is finding alternatives to firewood, particularly for rural areas, in order to decrease the pressure on forest resources. The Forestry Department maintains a research unit which develops and tests various FES models – it is through this unit that the Forestry Department began promoting the (primarily charcoal-burning) Azza stove.

The Azza stove was developed by the Forestry Department with the support of FAO during the last major regional drought in the mid-1980s. FAO provided the production machinery and the Forestry Department invested heavily in an advertising campaign to promote the use of the stove. The stoves were subsidized for sale in the market. Since that time, however, the Forestry Department has fewer resources and can no longer produce and promote the Azza. The extension teams, however, still maintain the technical know-how for the stove’s production.

According to the Forestry Department, the conflict in Darfur has increased the pressures on forests and natural resources, especially with the creation of the camps. There has been a large negative environmental impact: IDPs have cleared most of

the greenbelt around el Fasher, for example. The Forestry Department would like UN agencies and NGOs to work with them to mitigate the overall impact and to increase their awareness of the pressures on the environment.

The Forestry Department provides extension services, including maintaining a large nursery in town. NGOs or others who would like to make use of the nursery for reforestation programs, etc., are welcomed, and it may be used for propagation, distribution of seedlings, etc. In addition, extension workers can provide background on the Azza stove to interested agencies.

OCHA explained that they are not implementers, but are charged with facilitating the establishment of FES working groups, promoting coordination, etc., and it is from this angle that they are interested in the outcomes of the el Fasher workshops.

FAO explained that they work primarily through implementing partners, but are interested in FES and alternative energy programming from both a livelihoods and an environmental perspective. In North Darfur, FAO began introducing FES in 2004, by training NGOs such as German Agro Action (GAA), ITDG and local agencies on FES and providing manufacturing support.

In addition, FAO supports the Forestry Department, including through a reforestation program and the rehabilitation/development of village nurseries for the production of seedlings, etc.

B. DISCUSSION OF KEY POINTS RAISED DURING PRECEDING IDP WORKSHOP

I. VARIATION IN USAGE RATES WITHIN CAMPS AND FROM CAMP TO CAMP.

In the previous day's workshop, IDP participants indicated that there was a wide range in usage rates for FES both within and between camps. Service providers were asked what they believed may be the reasons for the variations and how to overcome low utilization rates.

- IDP participants estimated that the average duration of a new FES is between seven months and one year. Given that many FES programs in Abu Shouk camp are significantly older than that, it is possible that the first few rounds of stoves that

were made or distributed in the camps are now broken – hence the lower percentage of use. As Salaam, on the other hand, has only recently seen the introduction of FES – most stoves there are newer and can therefore be expected to still be operable and in use.

- Some inhabitants of As Salaam camp are actually (non-displaced) residents of nearby villages, who may have taken the stoves to their homes – resulting in the relatively low figure of FES coverage in that camp.
- Many IDPs still prefer to use small charcoal stoves for making tea and other items that require small fires.⁵ In many cases, they use firewood left over from a larger meal as the charcoal for their tea stoves. Several models of FES do not leave any leftover charcoal and IDPs may therefore not be using them.
- In Abu Shouk, for example, there have been so many different stoves promoted by so many different agencies throughout the years that it is difficult to get an accurate gauge of the overall coverage, let alone use of FES.
- Many participants believed that women who have been trained in the production of FES do indeed know how to repair and replace them (this belief was largely supported by the IDP participants themselves). However, trainees may not be repairing/replacing aging stoves due to lack of materials – particularly of donkey dung and metal grates used for ventilation in the CHF-improved model.⁶
 - The Forestry Department suggested that agencies with FES programs consider other options besides donkey dung for making the stove materials cohesive. Such alternatives could include sawdust, millet or sorghum straw, or chaff – which is readily available after a harvest. Agencies are welcome to liaise with the Forestry Department to learn more about such alternative materials.
- Many agencies promoting FES have used a Training of Trainers (ToT) model for stove production and it has become clear that the quality and efficiency of the stoves tend to decrease the farther removed the stove is from the original trainer. After becoming aware of this problem, CHF, for example, has changed its production/training technique from ToT to a skilled artisan model, whereby the same group of a few skilled trainers are responsible for training small

groups of women each day.

- Participants agreed that many IDPs have developed a sense of dependence, and once the stoves break, they await a new handout rather than taking the initiative to make a new stove on their own.

2. POTENTIAL DESIGN CHANGES

IDP participants had suggested that the “wire” – the mesh grate used toward the bottom of the stove to allow ventilation – in many of the stoves was prone to rapid degradation and greatly decreased the life expectancy of the stove. In addition, the wire mesh grate was expensive and difficult to obtain, possibly leading some users to abandon their stoves once the degraded mesh rendered them unusable. Service providers were asked to discuss possible design changes that could overcome this problem.

- CHF explained that the original version of its stove model used a thin mosquito screen for ventilation. When this proved too flimsy, it was switched for a thicker, one-layer wire grill. When this again proved too weak, it was supplemented with a second layer. CHF believes that the users who were noting the weakness of the mesh were likely still using earlier stove models and that in fact the concerns they raised had already been addressed.
- Other FES models use metal rods as opposed to the mesh grate. The rods are very sturdy and durable, but since the wood falls through the rods once burned, there is no remaining “leftover” charcoal. The mesh helps to collect such charcoal. Moreover, the mesh allows women to use the stove with either firewood or charcoal, whereas the rods only allow the use of firewood.
- The Forestry Department uses a fired brick with holes in the base of its otherwise primarily metal Azza stove. This design eliminates the need for a mesh or rods and, because the brick is fired, is very strong and long-lasting. Though the brick



takes a long time to heat up initially, once hot it can retain heat for long periods of time.

3. FES AND LIVELIHOODS OPTIONS

IDP participants had expressed doubt that there would be a market for the sale of FES produced in the camps; none of the 30 participants had attempted to sell a stove. However, many service providers have begun FES projects with the stated purpose of livelihoods support. These service providers were asked to discuss this perceived dichotomy.

- A key problem has been targeting, as was also noted by the IDP participants the day earlier. Though agencies with FES programs have developed very good coordination mechanisms for information-sharing, they have not been as successful with regard to determining and discussing beneficiary populations: different agencies may target the same women, not only causing confusion and wasting resources, but depriving other women of receiving trainings.
- At the beginning of its programming in Zam Zam camp in late 2005/early 2006, CHF observed that there were some stoves for sale in the camp market – leading the agency to believe it could begin an FES project for livelihoods purposes. However, there are fewer stoves for sale in the market now and demand has clearly dropped. CHF believes this change may be a direct result of FES programming: whereas in 2005, relatively few households had stoves, now many do, and therefore the market has constricted.
- Many – if not most – households have received or know they can receive a stove for free, so they will not buy one. In addition, the purchasing power of IDPs is extremely low, and most will only use their cash for necessities – apparently a stove is not considered a necessity in this calculation.
- The stoves themselves are quite heavy (15kg or more) and transporting many of them at once for sale in the market necessitates a wheelbarrow, donkey cart or other form of transportation – which is not always readily available.
- It is possible that a *few* women may be selling stoves in the town markets, or may be bartering stoves for other items, but this has not been documented. In as Salaam camp, many residents are

close to their home villages and may bring stoves there for use or sale. Zam Zam, however, is different, as most residents there come from more distant areas.

- Workshop participants did not believe there was a large market within the local community for stoves introduced by NGOs, including those produced in the camps. Most of the local population would prefer the metal stoves, as they are lighter, easier to carry and considered more valuable. The Azza stove has been well known for a long time and enjoys a good reputation among the local communities.
- The Azza stoves currently sell for 10 SDG (US \$5), though mass production by NGOs (as well as the increasing availability of empty metal containers) may decrease this cost.

4. PROMOTION OF ALTERNATIVE FUELS

Few IDP participants had heard of any types of stoves, fuel or fuel technologies beyond clay or metal FES. A few had heard of or even used gas cylinders, though the vast majority of participants in the previous day's discussion expressed extreme reluctance to use gas fuels because of the perceived risk to their children. No participants expressed any knowledge of or interest in solar cookers or other types of energy. Service providers were asked to discuss their experiences in developing and/or promoting alternative fuels and fuel technologies in Darfur.

- **Kerosene/gas:**
 - FAO has considered distributing kerosene, but acknowledged the concerns re: safety and security of the fuel among both displaced and non-displaced communities, as well as during transport and storage. FAO also engaged a consultant to investigate possibilities, and it was determined that the supply of kerosene in Sudan, particularly in rural areas, was too unpredictable to allow a large-scale kerosene program in the region.
 - CHF has worked with the (Darfur-based) Dar es Salaam Development Association to distribute a kerosene stove and determined that certain populations were more likely than others to use it – these were: 1). the elderly who could not physically collect firewood; and 2). the very poor, for whom the stoves were subsidized.

- CHF distributed approximately 400 kerosene stoves in Zam Zam camp, but found that availability of kerosene – as a result of supply fluctuations, travel/transport restrictions and cumbersome bureaucracy – is a serious problem.
- The Forestry Department introduced a refillable gas cylinder program for use in urban areas, which has been popular especially in South Darfur because there is ready access to the gas. However, it has been less successful in West and North Darfur, due to increased insecurity, higher cost resulting from larger transport distances and an overall lack of accessibility. Originally, the gas was distributed in installments, but this program failed as many users defaulted on their payments. In the end, the community has blamed the Forestry Department for failing to provide the gas in a reliable manner.
- Some participants believed that gas may be more of a possibility for use in Sudan now and in the future than it has been in the past, since Sudan is now an oil and gas producer, and there are more companies and infrastructure.

- **Solar:**

- Several service providers agreed that solar energy may prove valuable for both cooking and electricity generation, though effective/inexpensive means of harvesting this energy have not yet been fully exploited.
- CHF tested the cardboard and aluminum “CooKit” model of solar cooker in Darfur in 2005, but found that it was too slow and did not cook assida, the staple food in Darfur.
- The UN Industrial Development Organization (UNIDO)-Khartoum has been promoting the development of a new model of solar cooker and met with several NGOs in Darfur in early 2007 in order to obtain more information on the needs of beneficiaries, etc., to incorporate into their design.
- The local government sponsored a communal solar kitchen in el Fasher market in the early 1990s, but the project was a complete failure.
- Most service providers attending the workshop did not believe there would be major cultural barriers preventing the use of solar cookers in Darfur *provided that* the cookers were able to cook assida and other staple foods well and quickly. In order to do this, it was noted that the

cookers need to be very sturdy and able to support rigorous stirring. Convincing demonstrations would be key to the potential success of any solar cooker.

- Even if a solar cooker were not able to be used for the main meals, it was noted that it might still be used for sauces, tea, boiling water, etc.
- **Communal cooking:**
 - Some agencies have suggested building communal gas kitchens in camps, in a ratio of one per block. Though such a model could feasibly reduce firewood collection, etc., community acceptability has proven to be a major concern. Culturally, women in Darfur want to cook on their own, in their own houses. Communal cooking would require a very large-scale sensitization campaign, and may still not work.

PART III: IMPACT OF FES PROGRAMS ON FIREWOOD COLLECTION AND RESULTANT IMPACTS ON SPECIFIC SECTORS

One of the issues that arose from the previous day's discussion with IDPs was the question of whether or not firewood collection had decreased since the proliferation of FES. Most IDP participants said they no longer collected firewood at all, but rather were able to purchase the small amount they needed – roughly 50 percent of what they had been using with a 3-stone fire. However, participants estimated their total weekly firewood costs to be between 10 and 14 SDG (US \$5-7) depending on family size. Given the previously noted low purchasing power of IDPs, this seems to be a large sum, and the likelihood that women are no longer collecting firewood at all is in question.

Service providers were asked their opinions on this issue, as well as on how to increase the overall impact of FES on firewood collection patterns. It was acknowledged that whatever the original stated objective for a particular FES program was, the true impact would only be reached by first reducing the overall amount of firewood collection. Other positive impacts of FES programming – whether protection, environment, livelihoods of health/safety – would be secondary.

• **Protection**

- Several informal studies have shown that women collect less firewood, and less frequently, after the introduction of FES. For example, CHF noted that studies in Kebkebiyah and near el Fasher both determined that firewood collection had decreased by up to two-thirds. The participants in the previous day's IDP workshop echoed this finding; suggesting that with FES they were using half as much firewood as they did with 3-stone fires.
- However, there is disagreement among many agencies as to whether or not this is truly the case: women may be *using* less firewood, but they may be collecting just as much in order to sell the excess. Some agencies have even suggested that FES does more harm than good from a protection standpoint, because they have “changed the mentality about wood” – that is, it is now seen as a commodity and business opportunity, not just a household necessity. [Participants in the IDP workshop denied that they sold firewood, though they indicated that they knew other IDP women who did.]
- Agencies that have expressed concern about FES have said that they distort the traditional lives of beneficiaries; women now see a benefit from selling wood, which encourages *more* cutting, not less, and therefore has a negative impact on both physical and environmental protection.
- Other agencies, however, disagree with the conclusion that FES may be having negative impacts, and suggest that women would not subject themselves to the risks associated with firewood collection “merely” to earn income – they have other, safer means of earning income (working in town, farming, etc.), and by reducing the amount of wood necessary for cooking, the FES have indeed reduced the protection risks to women.
- In the end, workshop participants agreed that it is unlikely that anyone has concrete information on whether the amount or frequency of firewood collection has indeed decreased since the introduction of FES in Darfur, though it *is* clear that the consumption of firewood at the household level *has* decreased.

• **Environment**

- The number of inhabitants within the confines

of the camps and, increasingly, in urban areas is well beyond the capacity of the local forest resources – the settlement patterns are beyond the forest coverage capacity. Overgrazing is also a major environmental concern.

- The Forestry Department noted that the only areas in Darfur that have been showing measurable improvement (either before or after the introduction of FES) in terms of forest cover and other natural resources are the areas from which the IDPs fled and which are now uninhabited – and therefore recovering. There has been total destruction of the environment immediately surrounding IDP camps to up to a radius of one hour’s walk from the camps.
- Some local businesses are known to cut wood and sell it in the camps. However, not all IDPs can afford to buy the wood, and therefore still collect it themselves. The near-total deforestation around the camps has led many women to dig up the roots of previously cut trees, exacerbating the environmental damage (some species of trees can regenerate over time if their roots are in tact).
- **Livelihoods**
 - As noted above, service providers at the workshop did not believe that the evidence supports the idea that FES supplement income, either through the sale of stoves by trainees (to earn income) or through the money saved by having to purchase less firewood for use with the FES. In the camps, most women can only “buy” wood by trading or selling their food rations or shelter materials. Therefore, if they are using less wood, they may be saving rations rather than money.⁷
 - Several participants raised the issue of firewood suppliers, whether displaced or non-displaced: if the total amount of firewood being consumed truly is decreasing as a result of the introduction of FES, then their business should be decreasing as well, and the suppliers should be moving into different lines of work. A market survey of the firewood industry would be helpful to determine whether or not this is the case.

- **Health/safety**

- Most (though not all) participants agreed with the IDPs’ statements that the FES produced less smoke than a 3-stone fire and, because the fire itself is contained, greatly reduces the risk of burns (especially to children) and of accidentally settings huts and other structures on fire.
- More than any of the other suggested benefits of FES, the health/safety benefits are clear and tangible, and should be promoted as such (see “messaging,” above).

NOTES

¹ The Women’s Commission for Refugee Women and Children is a New York-based NGO focused on addressing the particular needs of refugee and displaced women and children. It is legally part of IRC.

² Though participants noted that this is only true if women and girls were not previously collecting wood, but rather were only purchasing it.

³ See above.

⁴ Though as noted in Section B (Part 3), the true market for such stoves is in doubt.

⁵ Participants explained that, traditionally, Darfuri women use firewood for cooking things in larger pots, such as assida, and charcoal for cooking smaller items, such as tea – a cook would not want to use a new bundle of firewood just for cooking tea. The “leftover” firewood from the main meal is then used as charcoal. Moreover, charcoal is cleaner-burning and a higher premium is placed on keeping teapots and tea utensils clean. Assida pots, on the other hand, are larger, stronger and do not need to be kept as clean.

⁶ CHF noted that it typically buys dung in bulk for use in its centers and that it can be complicated to obtain in large quantities.

⁷ In theory, these “excess” rations could then be sold as a means of earning income, though this would certainly not be encouraged.

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