



**Safe Access to Firewood and alternative Energy
WFP - North Darfur
September 2011**

Contents

- Executive Summary..... 4
- Project Background..... 10
 - Safe access to firewood and alternative energy..... 10
 - SAFE in North Darfur..... 11
- Fuel-efficient stoves and fire fuel briquettes training centers 15
 - Fuel-efficient stoves..... 15
 - Fire fuel briquettes..... 17
 - Nursery and Tree Plantation..... 18
 - Agri Business Centres..... 19
- Impact of the SAFE programme Changing Lives 20
 - Baseline..... 20
 - Impact assessment..... 21
- Conclusion: Lessons Learned and Ways Forward 25
 - Lessons learned..... 25
 - Way forward 26
- Annex 28
 - WFP’s fuel-efficient stove making production process 28
 - Nursery and Community Forestry..... 31
 - SAFE summary..... 32
- SAFE impact stories from North Darfur 33

Acronyms and Abbreviations

ABC	Agri business centre
CBOs	Community based organisations
CCT	Control cooking test
FAO	United Nations Food and Agriculture Organisation
FFB	Fire fuel briquette
FES	Fuel-efficient stoves
FFR	Food for recovery
FFT	Food for training
FIGs	Farmers interest groups
GFD	General food distribution
KAEDS	Kutum Agriculture Extension and Development Society
KPT	Kitchen Performance Test
KSCS	Kabkabiya Smallholders Charitable Society
PA	Practical Action
SAG	Sustainable Action Group
WBT	Water boiling test
WDAN	Women Development Association Network
WIGs	Women interest groups

Executive Summary

Through the Safe Access to Firewood and alternative Energy initiative (SAFE), the World Food Programme (WFP) is committed, as per the Inter Agency Standing Committee Task Force *“to reduce exposure to violence, contribute to the protection of and ease the burden on those populations collecting wood in humanitarian settings worldwide, through solutions which will promote safe access to appropriate energy and reduce environmental impacts while ensuring accountability.”* WFP’s interest and involvement in beneficiary access to firewood has many facets: protection and safety of beneficiaries; effectiveness of food and nutrition interventions; and mitigation of, and adaptation to climate change. Following a feasibility study, WFP started implemented the SAFE programme in North Darfur in July 2010.

This review presents the findings of an impact assessment and a technical review¹ of the SAFE programme in North Darfur one year after implementation started. The SAFE programme in North Darfur is the first pilot implementation and as such the process of reviewing the SAFE programme is a first attempt at measuring the results and impacts of the programme. This will enable WFP to consolidate lessons learned, highlighting successes that may be replicable and challenges, providing guidance for further programming. The technical review used a standard and commonly used technical testing procedure, the Controlled Cooking Test (CCT). However, the impact assessment remains limited due in parts to the technical difficulties in measuring impacts and the short duration of the programme implementation. Through the impact assessment, WFP has been able to gage the impact of the SAFE programme on protection, health, nutrition, environment and livelihood issues as well as other potential benefits through the perception of beneficiaries. Whether this perception reflects adequately actual impacts of the programme remains to be confirmed.

The objectives of the SAFE interventions in North Darfur are to:

1. Enhance the protection of women
2. Decrease dependency on firewood collection as an income source by creating alternative livelihood opportunities
3. Ease the burden on women and families by providing fuel-efficient stoves for households and WFP-assisted school meals
4. Protect the environment
5. Improve nutritional status and better diet diversity

¹ The full technical report is provided in the annex section.

The table below shows the SAFE activities, achievements and the number of beneficiaries reached through the SAFE approach during the period of July 2010 and March 2011.

<i>Fuel-efficient stoves and fire fuel briquettes training centres</i>				
Nb of centres established	Nb of trainings conducted	Nb of households reached	Nb of stoves made	Nb of fire fuel briquettes made and used
14	250	31,756	31,756	28,000
<i>Nurseries and tree plantations</i>				
Nb of nurseries established	Nb of plantlets germinated	Nb of community forestries promoted	Land area covered under community forestry	Nb of households reached
17	100,000	17	230 Acres	4800
<i>Agri Business Centres (ABCs)</i>				
Nb of ABCs established	Nb of trainings conducted	Nb of beneficiaries reached		
5	90	3500		

The outputs of the programme demonstrate the feasibility of implementing key activities to address the issues relating to access to cooking fuel in North Darfur. However, a number of challenges were faced in implementing the SAFE programme:

- The lack of effective cooperating partners on the ground
- The significant need to build up community structures and build the capacity of CBOs
- The need for a stronger and more systematic monitoring, including understanding the influence of economic and cultural variables

Successes and opportunities included:

- The acceptance of the project by the community allowed the project to flourish. This was due mostly to the fact that the SAFE approach was much needed in North Darfur as people truly struggled with accessing cooking fuel. In addition, WFP ensured that communities were sensitised to the issue and understood the objectives of the SAFE approach.

- While capacity building was necessary, CBOs working in the SAFE project were fully dedicated to the need of their communities and thus to delivering on the objectives of the project
- The introduction of mould to ensure better quality control of the fuel-efficient stoves was at first challenging but CBOs worked closely with beneficiaries to improve the mould which eventually became part of the success of the programme.

Overall, the pilot implementation of SAFE in North Darfur highlights insightful lessons learned, providing guidance for further programming. Key lessons learned to replicate in other programmes are:

- Setting up community structures
- Building capacity of CBOs/partners especially in terms of technical expertise
- Foster community ownership of the project by consulting, engaging and actively involving the community
- Development of adequate monitoring tools that can be flexible as the implementation of the project evolves with systematic and regular implementation
- Flexibility of programming to allow the project to evolve as opportunities arise and adaptation it to new circumstances with support from headquarters team
- Taking opportunities and initiatives to experiment new approaches and new modalities
- In-house technical expertise and know how on fuel-efficient stoves and alternative energy

The impact assessment, using a mix of quantitative method (household survey) and qualitative method (focus group discussions), is a first attempt at measuring the impact of SAFE:

1. The implementation of the SAFE programme appears to have contributed to reducing beneficiaries' exposure to **protection** risks linked with firewood collection. The household survey indicates that beneficiaries' interviewed observed a decrease in firewood collection-related protection incidents involving a member of their households. While the distance women have to travel to collect firewood has increased, the number of incidents appears to have decreased. This can be explained by the reduced need for firewood due to the provision of fuel-efficient stoves and fire fuel briquettes, effectively decreasing the frequency of trips needed to address cooking fuel needs at the household level.
2. **Alternative livelihood options** have been provided through the Agri Business Centres, benefiting 3,500 households. This provides an incentive to move away

from firewood collection as a livelihood option to more sustainable agriculture based livelihood options, effectively addressing protection issues linked with firewood options, the environmental impact of excessive firewood collection, and the need to develop agriculture to address food security.

3. Among the **benefits of the programme**, beneficiaries felt that the SAFE programme had freed income at the household level for other use - such as food, education, livelihoods and non-food items - reduced exposure to protection threats during firewood collection and freed up time to take care of children.
4. While the **impact on the environment** remains difficult to assess at such an early time, seventeen nurseries have been established as part of the SAFE project, 100,000 plantlets were germinated and 17 community forestry projects promoted representing 230 acres of land.
5. The **nutritional status and diet diversity** of beneficiaries were not directly evaluated. However, hygiene and smoke-related health issues were examined through the household survey indicating a perceived improvement in both hygiene-related health issues and a perceived decrease in smoke-related health issues. Additionally, beneficiaries stated selling less or none of their food rations to purchase cooking fuel, improving the food availability at the household level. Finally, as the SAFE programme allowed households to save money on cooking fuel, these savings may now be used for diet diversity and therefore improving the nutritional status of beneficiaries, although whether this actual occurs still remains to be evaluated.

The technical review complemented the impact assessment by reviewing the technical quality of fuel-efficient stoves and fire fuel briquettes. It involved conducting a series of Control Cooking Tests in order to evaluate the efficiency of the stoves, both household and institutional, provided through the SAFE programme. It also allowed a review of the fire fuel briquettes and their use. The team's main objectives were to: 1) assess the technical performance of various stove models, 2) study briquettes performance and production, 3) offer potential household and institutional stove designs, 4) provide capacity on Control Cooking Test, 5) make recommendations on commercialization and 6) provide recommendations on production and monitoring in parallel with scaling up.

Household fuel-efficient stoves

The technical review revealed that the WFP-briquette stove when used with wood is a viable stove design in that it reduces wood consumption by 60 percent. In relatively affluent areas such as El Fasher, the stove's heavy smoke emissions coupled with the potential odor and cultural taboo of handling animal dung may prove to be detriments to usability. However, in impoverished areas such as Kabkabiya where fuel is scarce, the

use of briquettes has great potential for success. Because smoke emissions are substantial, it is recommended that the current WFP-briquettes stove be used outdoors only and that research and development of improved briquettes and briquette-fueled stoves continue in earnest.

It is also observed that there is not only a need for an improved briquette stove, but also for an efficient wood burning stove in the region. The current WFP-wood stove requires modifications in order to be more efficient and to address usability issues. The development of a new design is recommended to provide a more viable wood-burning stove. This new design should ensure high levels of usability, at least a 40 percent fuel savings and a production process that ensures consistent stove dimensions and performance.

Additionally based on the prevalence of charcoal use throughout the region it is recommended that WFP add an improved charcoal stove to its current stove portfolio.

During visits to community based organisation (CBOs), it was observed that stove construction, maintenance, and training complement larger community development goals. As a result of these CBO visits, the importance of local stove production using local materials and local skills was apparent. Additionally, the construction, maintenance, and customization of the stoves are already well understood and practiced by the CBOs, thus ensuring the long term sustainability of the project.

Briquette Production

The CBOs have a well-established process of collecting raw materials for the use of briquette production and briquette production itself. In order to improve the quality of the briquettes being produced, the briquette press must be changed so as to yield uniform briquette thickness and increased density. More research is needed to determine the optimal raw material mix to make denser, higher quality briquettes.

Institutional stoves

The performances of three stone fires, mud stoves, and a factory stove (Prakti-Orka) were evaluated, but no conclusive performance comparison was made due to the large difference in pots used. The common pot used in Darfur schools is the standard 200-liter WFP pot while the Prakti-Orka uses an 80-liter pot. Without making a conclusive performance comparison, the high performance (fuel savings) and usability (reduced smoke, heat, speed, fire tending) of the Prakti-Orka were confirmed. In the future, improved stoves for schools should be able to use the standard 200-liter WFP pots.

Capacity Building

In order to support local capacity building, the following stove and fuel related activities were carried out in coordination with WFP staff and WFP partner staff: designing and running controlled cooking tests; processing test data and results analysis; interview of cooks; evaluation of briquettes performance; and new stove and stove tooling construction.

While the recommendations of the impact assessment and the technical review will be implemented to further improve existing activities, the SAFE project aims to scale up and introduce training and sensitisation for women on health, nutrition and care, and adult literacy.

Project Background

Safe access to firewood and alternative energy

The Inter Agency Standing Committee (ISAC) Task Force on Safe Access to Firewood and alternative Energy in Humanitarian Settings (SAFE) was created in March 2007. Its purpose was *“to reduce exposure to violence, contribute to the protection of and ease the burden on those populations collecting wood in humanitarian settings worldwide, through solutions which will promote safe access to appropriate energy and reduce environmental impacts while ensuring accountability.”*

Surveys mapping out how firewood and cooking fuel impact on food and nutrition were conducted in more than 17 countries across Africa, Asia and the Americas. They revealed that beneficiaries often resort to negative coping mechanisms to cook WFP food, including women collecting firewood in dangerous environments, exposing them to the risk of rape and other forms of gender-based violence; under-cooking food to save on fuel; skipping meals or selling part of their food rations to buy firewood or pay for milling costs. In addition to exposing people to violence, these coping mechanisms often limit the intake and nutritional absorption of WFP rations, reducing the impact WFP food assistance on relieving hunger and fighting under-nutrition. Harvesting firewood for cooking fuel also contributes to deforestation and the loss of important natural resources. In addition to the increased distance women and children have to travel to find available firewood and the increased exposure to risk of attack, environmental degradation also limits long-term livelihood opportunities in agriculture and forestry. As the linkages between climate change and food insecurity become more evident, the sustainable use of forests and natural resources are more critical.

WFP’s interest and involvement in beneficiary access to firewood has many facets: protection and safety of beneficiaries; effectiveness of food and nutrition interventions; and mitigation of, and adaptation to climate change.

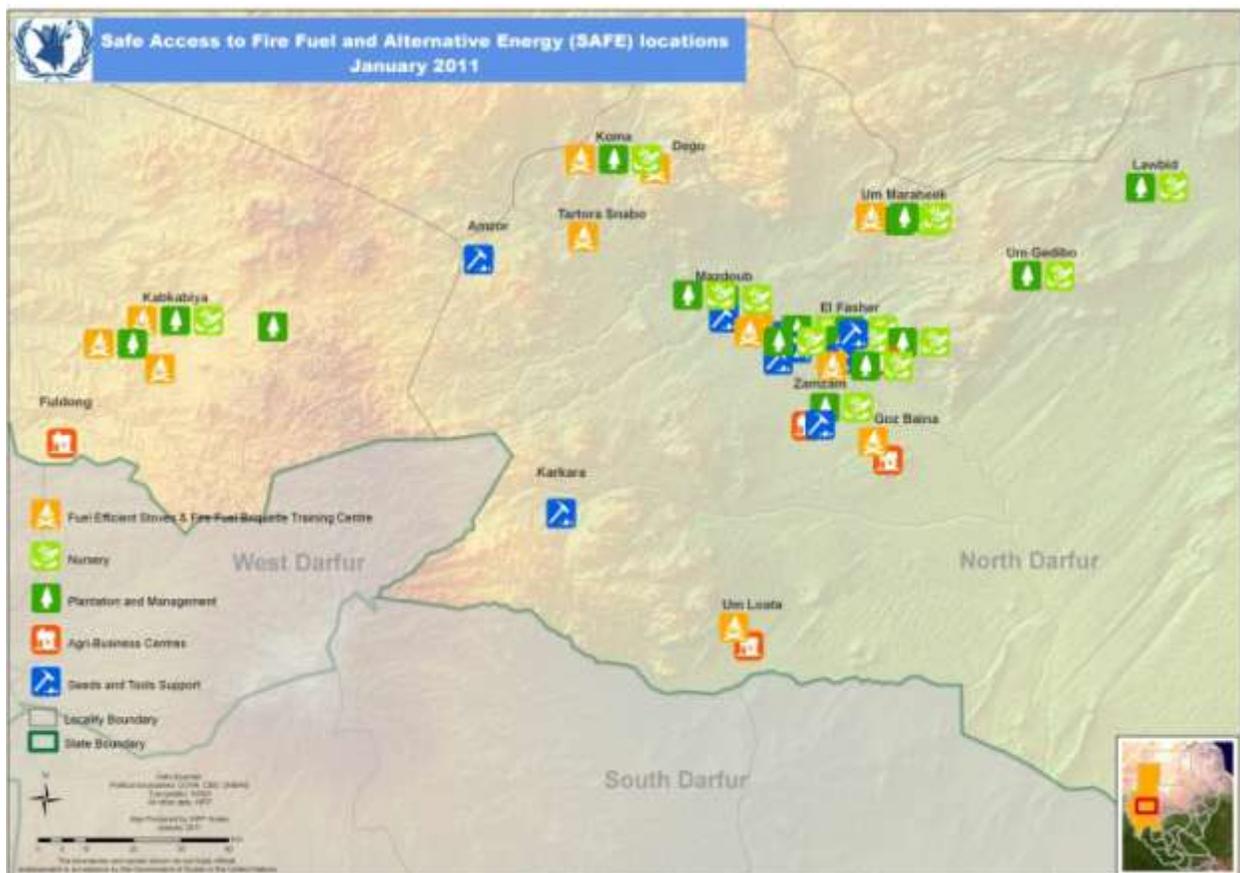
To address these challenges, WFP undertook feasibility studies in North Darfur, Uganda, Kenya, Sri Lanka, Chad, Ethiopia and the Democratic Republic of Congo where fuel scarcity is negatively affecting WFP beneficiaries. The purpose was to understand how beneficiaries are coping with fuel scarcity (and the related ramifications) in these contexts, to take stock of existing responses by both WFP and partners, and to propose a comprehensive approach that addresses human and environmental protection and recovery, livelihoods, food and nutrition.

SAFE in North Darfur

The feasibility study for North Darfur was conducted in October 2009. SAFE pilot interventions started in July 2010 in Kabkabiya and El Fasher Rural areas.

The objectives of the SAFE interventions in North Darfur are to:

1. Enhance the protection of women
2. Decrease dependency on firewood collection as an income source by creating alternative livelihood opportunities
3. Ease the burden on women and families by providing fuel-efficient stoves for households and WFP-assisted school meals
4. Protect the environment
5. Improve nutritional status and better diet diversity



SAFE is targeting both IDPs and rural communities in North Darfur. It is being implemented in El Fasher rural, Kuma, Kabkabiya, Tawila, Kutum and three IDP camps around El Fasher (Abu Shouk, Al Salam and Zamzam) reaching 96,000 households. The cooperating partners involved with SAFE are either local NGOs, including Kabkabiya Smallholders Charitable Society (KSCS), SAEKER Charitable Society, Kutum Agriculture and Extension Development Society (KAEDS) or community based organisations (Women Development Association Network).

WFP, in North Darfur, plans to continue supporting 96,000 households (500,000 beneficiaries) through December 2011 with SAFE activities.

WFP has adopted a community-based bottom-up approach for the implementation and monitoring of activities. Village level grass root structures have been promoted and small community groups are managing SAFE activities at the village level. They are responsible for monitoring and feedback.

WFP has established training centres to train communities on fuel-efficient stoves making, fire fuel briquette making as well as Agri Business Centres (ABCs) for training on agriculture-based livelihoods activities. These centres are being managed by small community groups called interest groups. For FES/FFB training centres Women Interest Groups (WIGs) and for Agri Business Centres (ABC), Farmers Interest Groups (FIGs) have been established.

WFP, in North Darfur, is implementing SAFE under Food for Recovery and Food for Training. During 2011, approximately **3,540 MT** of food will be distributed through SAFE in North Darfur.

The tables below show the SAFE achievements and the number of beneficiaries reached through the SAFE approach during the period of July 2010 and March 2011.

Fuel-efficient stoves and fire fuel briquettes training centres

Nb of centres established	Nb of trainings conducted	Nb of households reached	Nb of stoves made	Nb of fire fuel briquettes made and used
14	250	31,756	31,756	28,000

Nurseries and tree plantations

Nb of nurseries established	Nb of plantlets germinated	Nb of community forestries promoted	Land area covered under community forestry	Nb of households reached
17	100,000	17	230 Acres	4800

Agri Business Centres (ABCs)

Nb of ABCs established	Nb of trainings conducted	Nb of beneficiaries reached
5	90	3500

Baseline assessments were conducted before the start of the programme in Kabkabiya and El Fasher Rural. Baseline reports revealed that most of the beneficiaries were using a traditional three stone open fire, which impacted negatively the health of the users and consumed significantly higher quantities of firewood. A traditional three stone open fire consumes on average one bundle of firewood (approximately 8 Kg) to cook three meals a day for one household. The current cost of firewood in North Darfur is 6 SDG (US\$ 2.06). In urban/peri urban areas, households have access to markets to buy firewood and charcoal. In most of the rural areas, households rely on firewood collection. Due to high environmental degradation in North Darfur, most of the households gathering firewood have to currently walk around 13 Km per trip. Firewood collection mostly falls under the responsibility of women exposing them to the risk of physical harassment. The traditional three stone open fire is also a common cause of household fires.



Fuel-efficient stoves and fire fuel briquettes training centers

Fuel-efficient stoves

Nb of centers established	Nb of trainings conducted	Nb of households supported	Nb of stoves made	Nb of fire fuel briquettes made and used
14	250	31,756	31,756	28,000



WFP is promoting fuel-efficient stoves (FES) made from locally available materials like mud, donkey waste and agriculture waste. Following the recommendations of the FES assessment conducted in Darfur by ProACT Network and USAID and lessons learnt from previous stove programmes implemented by other agencies and NGOs, WFP adopted the strategy of promoting fuel-efficient stove principles instead of any specific type of stove. The training sessions at FES/FFB

training centres mainly cover environmental conservation, fuel-efficient stove principles, making of fuel-efficient stoves and fire fuel briquettes.

Based on community feedbacks, handmade stoves were time consuming as it takes 2-3 days to make 1 stove/beneficiary starting from collection of material, preparation and actual stove making. The 11 day training session for making stove was tedious. Most often handmade stoves were irregular in shape and size. After consultation with communities, WFP introduced stove moulds to ensure fuel-efficient stoves are uniform in quality and efficiency. The stove making with mould is now easier to do and more efficient than handmade mud stoves. It takes only 30 minutes to make one stove per beneficiary. These new mould stoves are very much liked by the community and consumption of firewood has been further decreased by 50 percent.



Several Water Boiling Test (WBT), Controlled Cooking Tests (CCT) and Kitchen Performance Tests (KPT) have been conducted to assess the efficiency of the stoves and

it was found that new mould-based fuel-efficient stoves (with firewood and briquettes) are 30 percent more efficient than the traditional three stone open fire.² CBOs/NGOs are now preparing to access carbon finance schemes for expansion of the project.

² See Annex for complete test results of the Water Boiling Test, Controlled Cooking Tests and Kitchen Performance Tests.

Fire fuel briquettes

While fuel-efficient stoves bring significant benefits, the scarcity of fire fuel in the area means that beneficiaries still need to go far away to collect firewood though the number of trips to collect firewood has diminished. To support beneficiaries in further reducing dependency on firewood for cooking needs and address the protection issues linked with firewood collection, WFP piloted fire fuel briquettes as an alternative fire fuel.

Fire fuel briquettes are being made from domestic waste (40 percent), animal waste (40 percent) and agriculture waste (20 percent). Beneficiaries collect waste from their house and neighbourhoods then sort the waste and non-biodegradable materials (metal and plastic). This waste is compressed in manual compressor called fire fuel briquetting unit provided by WFP.

So far WFP has distributed 1,600 manual fire fuel briquetting units seen in the picture below.



Nursery and Tree Plantation

Nb of nurseries established	Nb of plantlets germinated	Nb of community forestries promoted	Land area covered under community forestry	Nb Of households supported
24	290,000	17	230 Acres	4800

Through nurseries and tree plantation WFP is promoting community forestry in 17 locations along with scattered tree plantation. These community forestries consist of three different types of trees, long term sustainable firewood supplying species, tree species with commercial values and nutritious fruit trees. Below is the list of plant species grown and their purpose.

Nb.	Tree Species	Purpose
1	Gum Arabic	Its gum has commercial value, which is being used for manufacturing of soft drinks like Coke. Current market price of Gum Arabic is 14 SDG/KG.
2	Moringa	Highly nutritious and used for cleaning water.
3	Neem	High medicinal value and its extract being used as biopesticides for agriculture.
4	Jatropha	Soil re-conditioner, leaves used as fertiliser and seed oil used as alternative to the petroleum.
5	Lemon and other fruit trees	For household consumption

In 2010, 230 Acres of land have been covered under community forestry. Most of the trees are less than one year old and their commercial exploitation is yet to be determined. It is expected that, in the coming years, village level women groups will generate revenues from community forestry by selling the products specially Gum Arabic and Jatropha.

Within the same programme and as one of the sustainable option to graduate from general food distribution and blanket supplementary feeding programme, WFP is in the process of promoting highly nutritious Moringa specie, which helps addressing malnutrition. In Sudan, Moringa is also used for cleaning water.

Agri Business Centres

Nb of ABCs established	Nb of trainings conducted	Nb of beneficiaries
5	90	3500

As a pilot 5 agribusiness centres have been established in North Darfur. The main roles of these ABCs are capacity building and technology transfer for agriculture based livelihoods. Each ABC has a small demonstration farm where trainee farmers receive hands-on training on making compost and bio pesticides using locally available natural resources and sustainable agricultural practices. By the end of 2011, each ABC will have a seed bank and a tool bank to serve the community. These banks will loan seeds and tools to farmers in order to restore livelihoods.

Impact of the SAFE programme Changing Lives

Baseline

Household demography- Most of the population targeted under SAFE are IDPs (67 percent) with an average displacement period of 6 years. They mostly have daily labour (agriculture as well as non-agricultural labour). Some of them collect firewood for sale as a means of livelihoods earning on average 130 SDG per month as an income. After food (other than WFP food rations) expenditure which counts for 40 percent of total income, firewood /charcoal stands as the second most significant expenditure (15.94 percent of total income) for these beneficiaries. Most of them (84.58 percent) do not have savings and they are indebted to cover the cost of fresh food and firewood/charcoal.

Health is a major concern in this area. Respiratory diseases (68.08 percent) and other hygiene related problems are predominant and are caused by indoor air pollution and sanitation, both contributing factors for high rates of malnutrition in the area.

Household energy- 97.64 percent of the respondents use a traditional three stone open fire, which consumes a large amount of firewood and exposes people to smoke endangering the health of women and children. Most women tie their babies on their back while cooking which causes children to inhale the smoke coming out of the traditional three stone open fire. Worldwide 1.8 million people die due to indoor air pollution mainly from smoke coming out of traditional stoves and 85 percent of them are women and children. Most of the beneficiaries interviewed used both firewood and charcoal for cooking. Sources of firewood are mostly from collection and charcoal is bought from the market with an average expenditure of 2.49 SDG per day for firefuel.

Firefuel price is very high in the market due to scarce natural resources. Firewood price is on average 6 SDG/bundle (average 8 kg) which increases exponentially during the rainy season. Charcoal price is 10 SDG/15 kg.

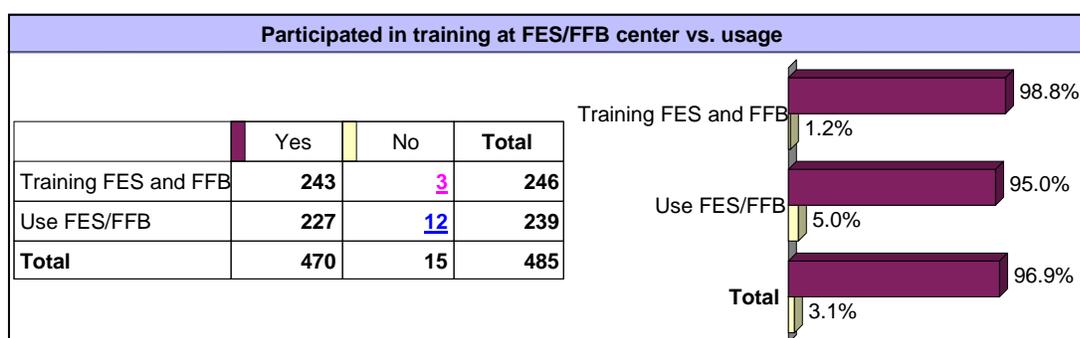
Protection issues- More than 50 percent of beneficiaries interviewed mentioned that they or their family members experienced harassment during firewood collection mainly from other ethnic/tribal groups. Women commonly bear the brunt of firewood collection. On average they travel 15 km by foot or donkey to collect firewood at least twice a week and spend more than six hours per trip to collect firewood.

Livelihoods- Ten percent of respondents were involved in firewood collection as means of livelihoods.

Impact assessment

SAFE activities target both IDPs and host communities. The impact assessment conducted in March 2011 shows the following findings.

Trainings – 98.8 percent of the respondents mentioned that they attended training on fuel-efficient stoves and fire fuel briquettes at the training centres and benefitted from environmental conservation activities, practical skills to produce and maintain fuel-efficient stoves and fire fuel briquettes. Ninety five percent of respondents mentioned that they are actively using fuel-efficient stoves and fire fuel briquettes at the household level.



Health - There is a significant decreasing trend in the occurrence of smoke-related diseases linked with indoor air pollution and hygiene.

Was any of your family sick/under treatment for the following diseases during the last 3 months?	Baseline responses		Impact assessment responses	
	Yes	No	Yes	No
Tape worm/hook worm/round worm	19.88%	80.12%	15.30%	84.70%
Diarrhoea / dysentery	65.02%	34.98%	49.40%	50.60%
Scabies	28.14%	71.86%	19.30%	80.70%
Anaemia and malnutrition	16.46%	83.54%	7.60%	92.40%
Respiratory diseases	68.08%	31.92%	57%	43%
Other hygiene related problems	40.80%	59.20%	19.30%	80.70%

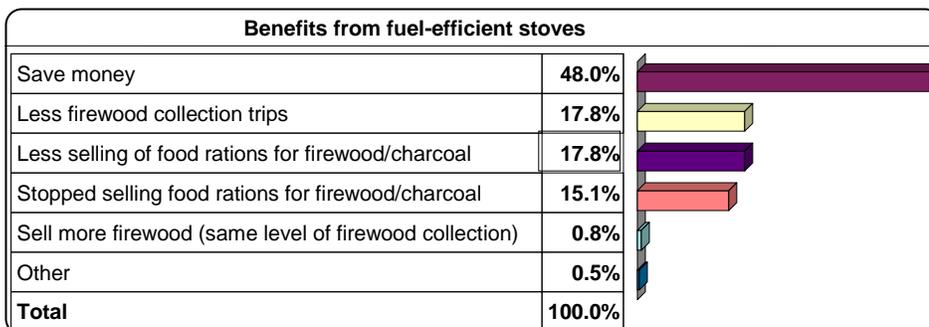
Fuel-efficient stoves -

There is a significant change in the type of stoves currently being used at household level: 74.30 percent of beneficiaries mentioned that they use fuel-efficient stove at their house and using it for cooking.

Stoves currently being used at household level	Baseline	Impact assessment
Three Stone	97.64%	24.90%
Mud (Fuel-efficient stove)	1.97%	74.30%
Metal	0.39%	0.80%

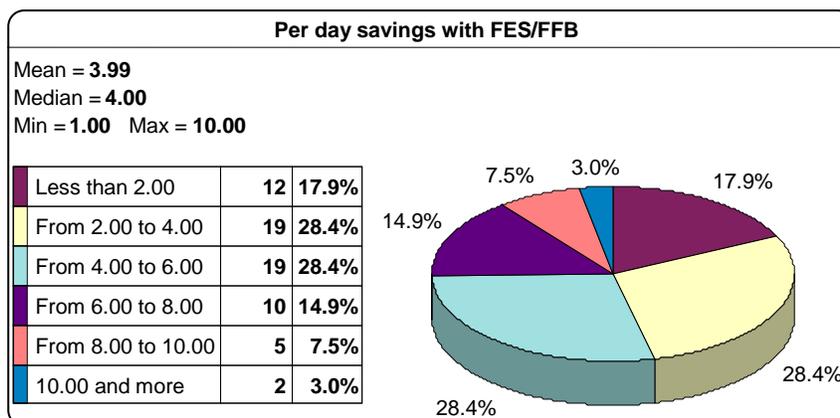
Household Energy

– While there is no notable change in fire fuel prices between the baseline and impact assessment period, all beneficiaries mentioned that fuel-

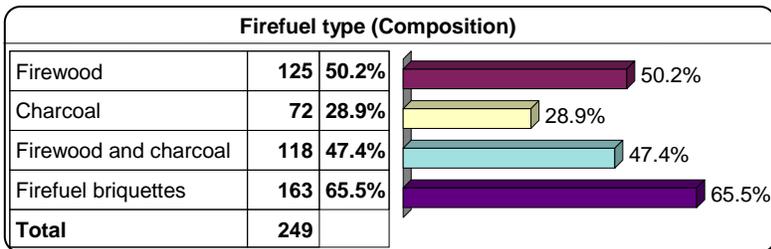


efficient stoves consumed less fuel compared with the traditional three stone open fire. This resulted in a number of benefits for beneficiaries: saving money, fewer trips for firewood collection and beneficiaries stopped selling or sold less WFP food rations for firewood/charcoal purchase.

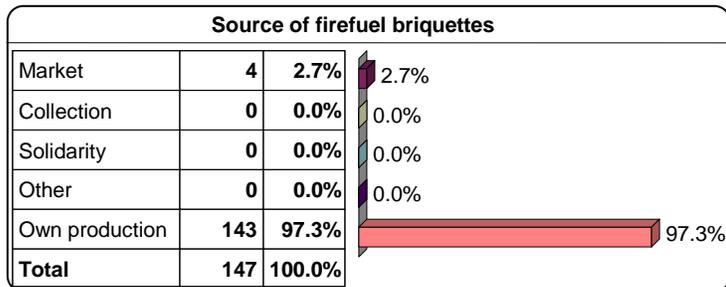
On average 3.99 SDG were saved per day using fuel-efficient stoves compared to a traditional three stone open fire. All respondents liked the design of the stove and mentioned that they faced no problems using fuel-efficient stoves for cooking.



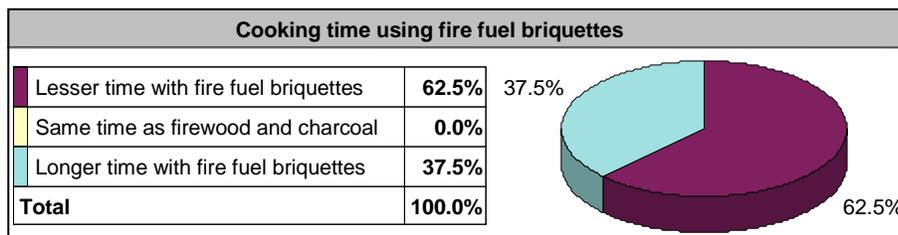
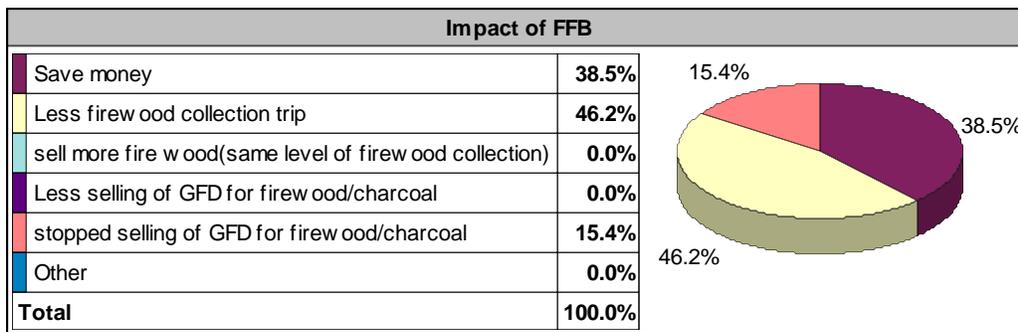
Fire fuel briquettes were introduced under the SAFE approach to provide an alternative cooking energy. The impact assessment revealed that 44.4 percent of beneficiaries are using self-made firefuel briquettes for cooking. On average nine briquettes are being used per day. Most of the beneficiaries are using mixed fire fuel (either firewood or charcoal with fire fuel briquettes).



Almost all respondents make fire fuel briquettes themselves to address household cooking needs.



The use of fire fuel briquettes contributed to reducing the number of firewood collection trips, saving money and no or less selling of food ration for firewood/charcoal purchase.



A majority of beneficiaries observed less cooking time using fire fuel briquettes in comparison with firewood or charcoal.

However, almost 40 percent estimated that cooking time was longer using fire fuel briquettes. All beneficiaries interviewed mentioned that there is no change in the taste of food when using fire fuel briquettes.

Protection

How far you or your family member travels to collect firewood?	Baseline	Impact assessment
Average (Km)	15.32	17.8

For those beneficiaries who still collect firewood, the distance between their village and firewood sources

has increased but *frequency/week to collect firewood has reduced from an average of four trips per week to two trips per week*. The reduction of firewood collection trips effectively reduces the exposure to firewood collection-related protection threats. Unfortunately, the increased distance may mean that the risks are higher for each firewood collection trip.

However, the impact assessment also reveals that there is an actual decrease in physical harassment during firewood collection.

Did you or your family members experience harassment during firewood collection?	Baseline		Impact assessment	
	Yes	No	Yes	No
	50.88%	49.12%	14.30%	85.70%

This decrease can be explained by the reduction in the frequency of firewood collection trips.

All the beneficiaries mentioned that their participation in the SAFE programme has brought significant changes in their lives by freeing income at the household level for other use - such as food, education, livelihoods and non-food items, reducing exposure to protection threats during firewood collection and freeing up time to take care of children.

Conclusion: Lessons Learned and Ways Forward

Lessons learned

This impact assessment not only demonstrates the feasibility of the SAFE programme but highlights the possibility of impacting positively health, nutrition, protection, environment and livelihoods issues linked with safe access to cooking fuel.

However, a number of challenges were faced in implementing the SAFE programme:

- The lack of effective cooperating partners on the ground
- The significant need to build up community structures and build the capacity of CBOs
- The need for a stronger and more systematic monitoring, including understanding the influence of economic and cultural variables

Opportunities fostered a successful implementation of the SAFE programme:

- The acceptance of the project by the community allowed the project to flourish. This was due mostly to the fact that the SAFE approach was much needed in North Darfur as people truly struggled with accessing cooking fuel. In addition, WFP ensured that communities were sensitised to the issue and understood the objectives of the SAFE approach.
- While capacity building was necessary, CBOs working in the SAFE project were fully dedicated to the need of their communities and thus to delivering on the objectives of the project
- The introduction of mould to ensure better quality control of the fuel-efficient stoves was at first challenging but CBOs worked closely with beneficiaries to improve the mould which eventually became part of the success of the programme.

Overall, the pilot implementation of SAFE in North Darfur highlights insightful lessons learned, providing guidance for further programming. Key lessons learned to replicate in other programmes are:

- Setting up community structures
- Building capacity of CBOs/partners especially in terms of technical expertise
- Foster community ownership of the project by consulting, engaging and actively involving the community

- Development of adequate monitoring tools that can be flexible as the implementation of the project evolves with systematic and regular implementation
- Flexibility of programming to allow the project to evolve as opportunities arise and adaptation it to new circumstances with support from headquarters team
- Taking opportunities and initiatives to experiment new approaches and new modalities
- In-house technical expertise and know how on fuel-efficient stoves and alternative energy

Way forward

Integrating nutrition, women rights, literacy training with SAFE training

Through SAFE, WFP adopts an integrated approach to skill transfers and community-level capacity building. FES/FFB training centres are not only used for training on fuel-efficient stoves and fire fuel briquettes but also to conduct training of trainers and community trainings on nutrition, handicrafts, literacy and women rights.

Access to carbon finance

To ensure the long-term sustainability of the SAFE project, WFP in North Darfur is in the process of linking implementing partners directly to carbon financing opportunities. WFP-promoted stoves are efficient and reduce firewood consumption. Each stove together with the use of fire fuel briquettes saves on average 50 percent of firewood compared to a traditional three stone open fire. WFP is exploring the possibilities to access Gold Standard Carbon Credits with premium carbon credit value.

Piloting biogas

While using fire fuel briquette is one effective alternative source of cooking fuel, WFP will continue to pilot the use of other alternative household energy sources. Currently, WFP is developing a pilot for biogas and has procured 400 medium-scale biogas plants. The units will be distributed one per 8-10 households as well as WFP-assisted schools. This pilot will be monitored and evaluated to establish the feasibility of scaling-up.

Creation of alternative livelihoods

Some households are involved in firewood collection and selling of firewood as a means of livelihoods and as a result of SAFE activities may lose this livelihood. Though it is a negative coping mechanism adopted by the community and affects the local environment adversely, households who cannot rely on firewood collection as an income generating activity are actively engaged through Agri Business Centres set up by WFP to encourage and restore their agriculture-based livelihoods, a much safer type of livelihoods that also supports efforts for recovery and food security.

Fuel for Education

One hundred institutional fuel-efficient stoves have been procured and will shortly be distributed in North Darfur to support the school meals programme in WFP-assisted schools. This initiative will reduce the costs of cooking meals for the community and reduce the drop-out rate of school children whose parents cannot afford to provide cooking fuel to the school while ensuring a clean and smokeless environment for children and cooks at school.

Annex

WFP's fuel-efficient stove making production process





WFP has established 14 fuel-efficient stoves and fire fuel briquette training centres in Kabkabiya, El Fasher rural locality and three IDP camps around El Fasher (Abu Shouk, Al Salam and Zamzam). So far, 31,756 households have been trained on environmental conservation, fuel-efficient stoves principles and making of fuel-efficient stoves and fire fuel briquettes. Twenty eight thousand fire fuel briquettes have been made and satisfactorily used by the beneficiaries for cooking purposes. Fire fuel briquettes are high density brick made up of domestic/household waste, agricultural waste and animal waste. It addresses two key issues: a) sanitation and utilization of garbage resulting in clean house and environment and b) the need to reduce the consumption of firewood and charcoal while fulfilling the need for household energy.





**Cooking Demonstration –
Control Cooking Test using different fire fuels**



Nursery and Community Forestry

Seventeen nurseries have been established/rehabilitated with a capacity of 120,000 plantlets per annum. Currently, 100,000 plants were transplanted and maintained by the community under community forestry. Two hundred and thirty acres of land have been reforested as part of the SAFE programme since the start of the programme in July 2010.



SAFE summary

WFP in North Darfur is promoting Safe Access to Firewood and alternative Energy (SAFE). SAFE is an initiative that aims to promote the integration of household energy needs into humanitarian response, and more specifically:

1. Enhance the protection of women
2. Decrease dependency on firewood collection as an income source by creating alternative livelihood opportunities
3. Ease the burden on women and families by providing fuel-efficient stoves for households and WFP-assisted schools
4. Protect the environment
5. Improve nutritional status and better diet diversity

So far, more than 30,000 households were trained on the principles of fuel-efficient stoves and hands-on training for fuel-efficient stoves (mud stoves) making through 14 fuel-efficient stoves training centres. WFP is promoting alternative firefuel energy sources like briquettes (made of animal waste, domestic waste and agricultural waste).

So far, 1,600 briquetting units were provided by WFP in North Darfur. Groups of beneficiaries use the training centres to make briquettes for their household consumption. This year, WFP's target is to support 96,000 households with fuel-efficient stoves and firefuel briquettes. WFP's approach is not only providing stoves but also to train beneficiaries on FES principles and environmental conservation linked with household energy. WFP is also in the process of providing institutional fuel-efficient stoves and briquetting units to WFP-assisted schools under WFP's School Meals Programme.

As an alternative livelihood option to firewood collection and selling, WFP has developed agriculture-based livelihoods. WFP has established five Agri Business Centres where beneficiaries learn how to make compost and bio pesticides using locally available resources, Good Agricultural Practices (GAPs).

WFP has established 17 nurseries for tree plantation and more than 120,000 trees are being maintained by beneficiaries.

WFP is working with local NGOs and CBOs for the implementation of SAFE. The objective is to link these community groups to the carbon credit market to ensure a responsible exit strategy and the sustainability of the programme. In the mean time, WFP is aiming to link these community groups with small grants/funds sources until they are able to access carbon funding.

SAFE impact stories from North Darfur

Darfur Mother Designs Award-Winning Stove

Published on 08 December 2010 WFP GO



Halima, 28, won a contest organised by WFP among women trained to make their own clean-burning cook stoves to see who could design the most efficient model. WFP/Pia Skjelstad

Halima, a 28-year-old mother from Northern Darfur, has won first prize in a contest among local women trained by WFP to make their own clean-burning cook stoves. She won by designing a stove that consumes less wood and produces less smoke than all of the others.

NORTH DARFUR — Though Halima, 28, has no formal education, the stove she now uses to prepare her lunch for her 12-year-old daughter suggests that she has a solid grasp of the laws of thermodynamics.

She points to the combustion chamber and the air intake, and shows how the pot sits over the cooking surface to get maximum use out of the heat.

“It produces less smoke and saves me time,” she says proudly. “Instead of spending hours and hours gathering wood, I can look after my family and work in my vegetable garden.”

The stove, which won Halima a US \$300.00 cash prize, will burn anything from wood to cow dung to household waste. She learned to make it during a training course organised by WFP as part of its Safe Access to Firewood and alternative Energy (SAFE) initiative in Northern Darfur. Halima says that she named the model Sabrin after a dear friend who lives in Khartoum.

Innovative design

On average, these stoves consume around two-thirds less wood than the traditional way of cooking—over an open fire—which means that women like Halima can spend less time foraging for firewood.

In the arid plains of northern Darfur, gathering firewood can take hours and exposes women to the threat of rape and violence by the many armed groups which roam the area. It also despoils the land of precious vegetation, leaving it vulnerable to drought and floods.

Better and safer

Stoves like Halima’s also produce much less smoke, the cause of deadly indoor air pollution, which kills over 1.8 million people every year.

But Halima says that one of the nicest things about her stove is that it is safe. Unlike an open fire, she can walk away from the stove while her food is cooking and clean up around the house or perform other chores.

As efficient as her new stove is, Halima added that she has already begun thinking about ways it could be improved even more.

About the author



[Pia Skjelstad](#)

Policy Officer

Pia works as a Policy Officer in WFP’s Humanitarian Policy and Transition Service.

Sudan: Clean Cookstove Puts Mother's Mind at Ease



Khadija prepares the mid-day meal for her family using her new fuel-efficient cookstove. WFP/Pia Skjelstad

Khadija, a mother of 14, recently got a new stove that burns two thirds less wood than the open fire she used before. That means much less time spent foraging for firewood, a dangerous necessity in northern Darfur which carries the risk of rape at the hands of roving militants.

By Pia Skjelstad

MAJDUB -- Khadija is a mother of 14 and the wife of the village leader, or "Sheikh", thus a respected lady in Majdub village in northern Darfur.

She shows off her cooking area where she has two different stoves. The first one—her “old” stove—consists of three stones on which she used to balance a cooking pot over an open fire.

The new stove, which she learned to make herself through a WFP training programme, is made out of clay and has all but replaced the one Khadija used before. She explains that it consumes a third of the amount of firewood her old stove burns, which has drastically reduced the amount of time she spends gathering firewood.

Straying from home

“Women and girls can be raped by soldiers if they go even just a few hundred metres outside of the village,” she explains. “If they get pregnant, their babies are *haram* – forbidden.” Within the village confines, there is almost no firewood left to gather, so she has to buy it.

One of Khadija's daughters is 15 years old now and she and her husband fear for her safety. But the new stove has put their minds at ease. Now that they consume two-thirds the amount of firewood they burned before, they can afford to buy it if they have to.

Khadija's new stove is also protecting her and her family's health. It produces far less smoke, which used to fill the house when she cooked, burning their eyes and lungs.



Set in her ways

Khadija got her stove as part of WFP's Safe Access to Firewood and alternative Energy (SAFE) initiative which is bringing stoves like hers to over 131,400 households and 219 schools in both Northern Darfur and Uganda.

Her husband suggests that they get an LPG stove instead, which runs on a kind of fuel that produces practically no smoke at all. "It will keep my wife beautiful and protect her skin," he reasons.

But Khadija tells him to shush. She has cooked with wood all her life, and while she is happy to burn less of it, she is not interested in cooking with anything else.

Talking to Arafa Hassan Musa Ibrahim:

The fire fuel briquettes are too big for the stove, making it less practical and giving out more smoke. But it is still very useful to have the briquettes. Arafa uses seven briquettes per day for her family, which means money saved every day. She gets to use the unit for two days, every other week. Arafa is grateful for the SAFE project and the additional money she can save for her children.

Talking to Fatuma Ahmed Abubaker:

Fatuma, a smiling young woman, shows how the entire SAFE process of making fire fuel briquettes works. From a collected pile of garbage, to the newly pressed damp bricks drying in the sun, to a smouldering brick in a stove where tea is being prepared, Fatuma gestures and explains the steps that need to be taken in order to produce fire fuel. Fatuma has been collecting garbage for a year in Kabkabiya, but it wasn't until 6 months ago that she started to use the garbage as fire fuel. This was when WFP piloted the SAFE project. Prior to that she collected firewood outside the town and risked both possible beatings and rape. With the briquettes, Fatuma says she avoids these risks, plus she can now use the money she saves on milling cereals instead. When asked what can be improved with the current SAFE project she replied "more units for us to use!". Fatuma says that she needs 5 briquettes per day to be able to cook for her family, and the SAFE project saves her both time and money, and removes a big risk element in her daily life.

