



Ethiopia Dollo Ado Camps

Domestic Energy Review and Recommendations

Mission Dates : 22 – 30 September, 2011

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<p>THE OPINIONS EXPRESSED IN THIS REPORT ARE THOSE OF THE AUTHOR AND NOT NECESSARILY OF UNHCR ITSELF</p>

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Glossary of Terms

Glossary of Terms

ARRA	Administration for Refugee-Returnee Affairs
CCT	Controlled Cooking Test
CRI	Core Relief Items
DRC	Danish Refugee Council
FES	Fuel-Efficient Stove
Gaia	Gaia Association (NGO)
Humedica	Humedica International Aid
IPs	UNHCR's Implementing Partners
LWF	The Lutheran World Federation
NFIs	Non-food Items
NGOs	Non-Governmental Organizations
PAPDA	Partnership for Pastoralists Development Association
SGBV	Sexual and Gender-Based Violence
THW	Technisches Hilfswerk, Federal Agency for Technical Relief
UNHCR	United Nations High Commissioner for Refugees
WASH	Water Sanitation and Hygiene
WFP	World Food Programme
WHO	World Health Organization
WV	World Vision
ZOA	ZOA Refugee Care (NGO)

Acknowledgements

Acknowledgements

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Appreciation is also extended to the refugee and host communities who provided vital feedback and ideas regarding the domestic issues, which has highly contributed to identify possible interventions.

Executive Summary

Executive Summary

In response to the request from the Dollo Ado operation following several critical security incidents including SGBV related to firewood collection, a domestic energy mission to Dollo Ado was conducted from 22 to 30 September 2011. The mission team consisted of environmental officers based in UNHCR Addis Ababa and from UNHCR Geneva.

The field assessment and household surveys showed that 100% of refugees who have not received a fuel-efficient stove (FES) are using firewood on open fires. Families in average claimed to be consuming around 10kg of firewood per day, exposing themselves to harassment and violence from the host communities. Almost half the refugees are choosing to buy firewood from the market to avoid risks associated with firewood collection, and spend around 15-20 birr (\$0.86 – \$1.2)/day, which is worth purchasing 2kg of rice or 4kg of wheat at the local market.

Most of the refugees in Bokolmanyo and Melkadida who received FESs between 2009 and 2010 are using them on a daily basis. However, of those who stopped using them, it was due to the lack of follow-up training or maintenance, thus showing that sufficient training programmes and establishment of stove maintenance program is needed.

Several types of FESs were tested through Controlled Cooking Tests (CCT). The results showed that locally made rocket stoves have a potential to save up to 83% of fuel if used properly. However, household surveys conducted with families who had previously received those stoves showed that they have only been saving up to 50%, also proving the need for training and follow-up. The test also proved that heat retention boxes are effective to save fuel in combined use with FESs.

The following action plans were discussed and agreed upon in Dollo Ado through coordination meetings with counterparts:

- ◆ Locally manufactured rocket-type FESs will be distributed to the entire refugee population and host communities in the Dollo Ado camps
- ◆ Follow-up assessment and training modules will be established for sustainable use
- ◆ Institutional FES to be installed in all group-cooking facilities. Stoves are already procured by OSTs and expected to arrive in November.
- ◆ Heat retention boxes will be procured by UNHCR
- ◆ IPs will install some solar street lights as a pilot project
- ◆ IPs will distribute thousands of solar lanterns
- ◆ UNHCR will seek additional funding for solar lighting
- ◆ Kerosene distribution will start after kerosene supply has been secured and safety ensured. Pilot study and intensive training are to be conducted. Alternative energy including ethanol will continue to be looked into.
- ◆ Planting of multi-purpose trees including those for firewood will continue with IPs

As a conclusion, locally-manufactured FESs are quite efficient, but establishing a training and maintenance program is crucial. Heat retention boxes will need to be procured and fuel distribution will be implemented in parallel to reduce pressure related to firewood collection. Fund-raising for solar lighting also needs to be boosted.

Background

Background

1. *Situation Context*

Four refugee camps in Dollo Ado, namely Bokolmanyoo, Kobe, Melkadida, and Hilaweyn now host over 120,000 refugees (as of September 2011) from Somalia. In response to the sudden and large scale refugee influx from Somalia, UNHCR has been providing emergency support to improve health, nutrition, and protection of refugees.

The issue of domestic energy is an inevitable component for the protection of refugees. A recent internal report alerted on the high risk of SGBV as a result of women collecting firewood. Host communities in Hilaweyn and Kobe are also reported to be reticent towards refugees collecting firewood because of environmental degradation in camps where natural resources are already scarce. While 80% of the camp population consists of children under 18 years old, malnutrition is widely reported.¹

UNHCR and its partners have stocked and distributed almost 30,000 stoves.² Some of them are kerosene-based, and some are FESs. While emergency procurement of stoves continues, it is crucial for UNHCR to conduct domestic energy assessments urgently in Dollo Ado camps and establish a strategy on further intervention. Sustainable and consistent intervention to improve the issue of domestic energy is essential to reduce protection risks related to firewood collection and conflict with host communities while ensuring cooking fuel is vital to improve the nutritional status of children.

2. *Camp population*

The refugee population in Dollo Ado region is at 112,115 people (as of 16 September 2011). Melkadida has the largest population followed by Bokolmanyoo, Kobe, then Hilaweyn. A high rate of refugee influx is continuing, and another camp is opening soon near Hilaweyn.

The male-female ratio is 46.7% to 53.3%, and 67.7% of the population is under 18 years old. This population demography adds another protection risk, as firewood collection is considered to be the work of women and children. Also during the mission, several Somali refugee men commented that they would never escort women for firewood collection despite the security incidents, as they do not feel comfortable culturally.

Cooking is also the responsibility of women and children, and Somali men often refuse to be involved. As the majority of the camp population is under the age of 18, even small children are seen cooking with firewood on open fires, making them vulnerable to fire hazards.

¹ [UNHCR Dollo Daily 26th to 28th August 2011](#)

² [Refugees in the Horn of Africa: Somali Displacement Crisis Information Sharing Portal](#)

Background

Dollo Ado Population Statistical Report

As of 16 September 2011

Figure 1.1 - Total Refugee Population in Dollo Ado

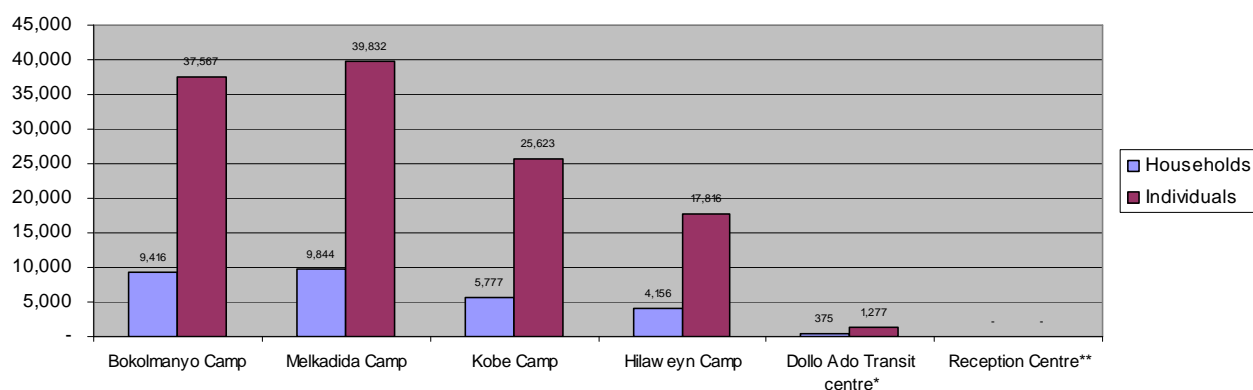


Table 1.1 - Total Refugee Population in Dollo Ado

Site/Camp	Current Total		As of 31 Dec 2010		Arrivals in 2011	
	Households	Individuals	Households	Individuals	Households	Individuals
Bokolmanyo Camp	9,416	37,567	3,988	14,988	5,428	22,579
Melkadida Camp	9,844	39,832	6,452	25,491	3,392	14,341
Kobe Camp	5,777	25,623	n/a	n/a	5,777	25,623
Hilaweyn Camp	4,156	17,816	n/a	n/a	4,156	17,816
Camp Sub-Total	29,193	120,838	10,440	40,479	18,753	80,359
Dollo Ado Transit centre*	375	1,277	n/a	n/a	375	1,277
Reception Centre**	n/a	n/a	n/a	n/a	n/a	n/a
Temporary Locations Sub-Total	375	1,277	n/a	n/a	375	1,277
GRAND TOTAL ALL LOCATIONS	29,568	122,115	10,440	40,479	19,128	81,636

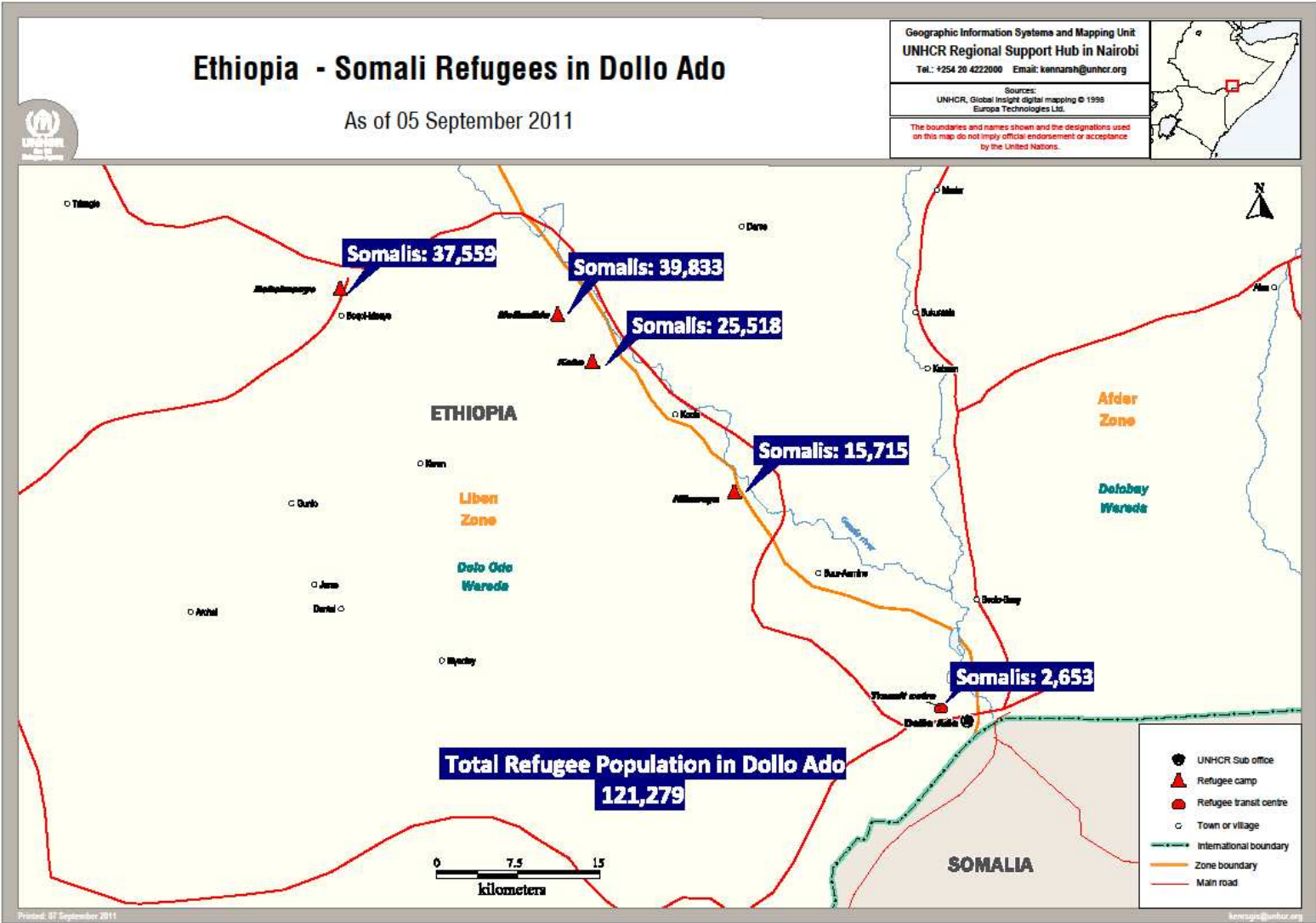
Table 2.1 - ALL CAMPS Demographic Breakdown*

Age Group	Sex				Total	
	Male	(%)	Female	(%)	Total	(%)
0 - 4	15,898	13.0%	15,428	12.6%	31,326	25.6%
5 - 11	19,414	15.9%	18,475	15.1%	37,889	31.0%
12 - 17	7,110	5.8%	6,468	5.3%	13,578	11.1%
18 - 59	13,188	10.8%	23,479	19.2%	36,667	30.0%
60 and above	1,443	1.2%	1,397	1.1%	2,840	2.3%
Total ALL CAMPS	57,053	46.7%	65,247	53.3%	122,300	100.0%

* These total figures apply only to camps, not to the Transit Centre or Reception Centre

Map of Dollo Ado

Map of Dollo Ado



Mission Overview

Mission Overview

1. Objectives of the Mission

- ◆ Assess the use of domestic energy in the Dollo Ado camps through field assessments, discussions with UNHCR, ARRA and IP staff, and focus-group discussions with refugee communities
- ◆ Train staff members to conduct domestic energy assessments and to use monitoring tools. It includes training on the fuel-efficiency testing method of various stoves currently provided by the different IPs and the ones available in the market
- ◆ Evaluate possible energy-saving and alternative energy options which could be applied to the Dollo Ado situation

2. Mission Programme

1. Assessment of Domestic Energy Use

Field assessments will be conducted in and around the refugee camps on the domestic energy use by the refugees. The assessment components will include the type and amount of fuel needed, what is available, and how much is currently provided. Focus-group discussions with refugee communities especially women and children, and home visits will also be conducted. Discussion with UNHCR, ARRA, and IPs will also be crucial to assess the overall situation surrounding the issue, and to come up with forward planning.

2. Training of Domestic Energy Assessment and Monitoring Tools

Training will be provided to staff members on the ground for sustainable assessment and monitoring on domestic energy. Various tools and methods related to cooking fuel will be introduced, including the testing method of cook-stoves currently used in the camps and those available in the market.

3. Evaluating Possible Energy Saving and Alternative Energy Options

Through the mission, energy saving options such as FES and introduction of energy-saving practices as well as alternative energy including solar and eco-friendly briquettes will be identified and discussed for further implementation.



Key Findings

Key Findings

1. Summary of Current and Planned Interventions

1) Fuel-efficient Stoves (FESs)

Camp		Bokolmanyoy		Melkadida		Kobe	Hilaweyn
Demand	Refugee	9,416		9,844		5,752	4,155
	Host Community	(+tbc)		(+tbc)		(+600)	(+tbc)
Implementer		ZOAA	WV or PAPDA	ZOAA	WV or PAPDA	ZOAA	WV or PAPDA
Supply (2009-2010)		5,460	-	5,951	-	-	-
Supply (2011)		-	3,956 (+tbc)	-	3,893 (+tbc)	6,500	4,155 (+tbc)
Gap		0		0		0	

- Number of host community households in Bokolmanyoy, Melkadida, and Hilaweyn needs to be confirmed for effective distribution plan.
- Hilaweyn camp will be given a priority for distribution when the stoves ordered by WV and PAPDA arrive, as the situation is critical and the camp has not received any stove so far.
- ZOAA will conduct assessments on stoves which need to be repaired/replaced.
- With the stove contribution planned by WV and PAPDA, it will cover the whole refugee and host communities.
- WV and PAPDA sent orders for the same type of rocket stoves used by ZOAA to the supplier based in Addis Ababa. Current production capacity of the supplier is 300 per week. They are occupied to meet the order of 6,500 units from ZOAA until October. Intervention at Addis Ababa level is needed to increase production capacity without neglecting quality of the stoves.

2) Kerosene

- Procurement and stove distribution is to be confirmed by ARRA/UNHCR.
- Thorough training is needed for safe use of kerosene.
- Stable kerosene stoves need to be procured due to strong wind in the camps.

3) Alternative Energy

- Alternative energy will be further discussed. DRC is interested in the subject.
- Solar cookers did not show positive results under the climate conditions in Dollo Ado. Unless a particular agency/NGO shows commitment to conduct thorough testing and training, it is not a recommended solution.

4) Solar Lighting

- THW will be installing 5 solar street lights in a refugee camp as a pilot phase. There is a possibility of expansion depending on the results.
- World Vision will be distributing 20,000 solar lanterns in Bokolmanyoy and Melkadida.
- Humedica is planning to procure solar lanterns.

5) Tree Planting

Key Findings

- PAPDA has distributed 6,000 trees in Bokolmanyo and Melkadida mainly near NGO facilities. 30,000 seedlings are now in a nursery by Genale River near Melkadida camp, and they are targeting to grow and distribute 100,000 trees per year to be distributed in both camps as well as host communities.
- LWF in partnership with PWO is growing 60,000 seedlings in nursery sites near Dollo Ado town and Hilaweyn, and they will be distributed accordingly.

2. Household Survey

A household survey was conducted in all of the refugee camps through random home visits. 10 households in each camp were visited and women of the houses were interviewed. For Kobe camp, only 7 households were interviewed due to logistical reasons.

Refugees recognize firewood collection as a role of women and children, and several male refugees interviewed replied that they do not escort women during firewood collection despite the security risks they face.

The idea of communal kitchen was also shared with several refugee families. Communal kitchens have been effectively saving cooking fuel in some country operations, as cooking as a group consumes less firewood compared to each family cooking individually. The refugee families interviewed, however, disagreed strongly to this idea. They would like to maintain their individual kitchens to protect their privacy, and they claimed that different families cooking together is not a norm in Somali culture.

Regarding the rocket-type stoves already distributed by ZOA between 2009 and 2010 in Melkadida and Bokolmanyo, quite a number of refugees were seen using them on a regular basis. At the same time, some need more training and maintenance for their sustainable use.

Also, the most common comment by the refugees is the difficulty to cook Somali Injera (pancake) with this type of stove. The pan falls in the center of the stove, and as they cook pancakes, fire escapes from the sides of the pan, burning their hands. Some refugees therefore mentioned that they use open fire to cook pancakes.



Injera pan inside the rocket stove

“one woman-back of firewood” as Somali refugees call it. It is enough only to cook for maximum 3 days per family.



Key Findings

Hilaweyn

- **100%** of the family households visited were using open fire (3-stone fire) with firewood.
- Refugees use **2kg** of firewood per day per person in average.
- **60%** of households surveyed purchase firewood from the host community, costing **430 Ethiopian birr (25 USD)** in average per month. One kilo of rice is sold at 10 birr and wheat at 5 birr. In order to afford 430 birr for firewood, they have to sell at least 86kg of wheat distributed by WFP.

Kobe

- **84%** of the family households are using open fire (3-stone fire) with firewood.
- Refugees use **4kg** of firewood per day per person in average.
- All refugee households visited were collecting firewood, and there was no firewood being sold in the market.
- Regarding rocket stoves distributed by ZOA, one household was not using it as she felt that the stove consumed more firewood, while another household was using it and was saving 50% of firewood.

Melkadida

- Among those provided with rocket stoves by ZOA, **80%** of the family households are using the stove. Many of them need repairs, especially the wooden handles as they seem to fall off easily.
- With rocket stoves, refugees in average feel that they use **45%** less firewood than open fire.
- **40%** of the refugees are collecting firewood, while **40%** others buy them, and **20%** sometimes buys and sometimes collects them by themselves. Those who buy the firewood spend **10-40 birr (0.60-2.4 USD) per day**.

Bokolmanyo

- Among those provided with rocket stoves, **60%** of the family households are using the stove. **40%** are not using it for two reasons i) stove gets too hot and it burns their hands and ii) inner ceramic part got broken. Among those using rocket stoves, some of them are also using open fires to meet the demand to cook larger quantities for the family in a short time.
- With rocket stoves, refugees in average feel that they use **59%** less firewood than open fire.
- **30%** of the refugees are collecting firewood, while **50%** others buy it, and **20%** sometimes buys and sometimes collects wood by themselves. Those who buy the firewood spend in average **17 birr (1 USD) per day**.



Key Findings

3. Stove Testing Result

Controlled Cooking Test (CCT) was conducted. One kilo of rice was cooked in the same way using four different types of stoves; i) open fire, ii) rocket-type FES, iii) multi-fuel stove, and iv) Save80 (German stove previously piloted in Jijiga) with heat retention box.

Test Result

Stove Type	Open Fire	Rocket stove used by ZOA		Multi-fuel stove	Save 80 with Wonderbox (heat retention box)	Open Fire with Wonderbox
		Test 1*	Test 2**			
Firewood used (kg)	1.77	0.93	0.3	1.93	0.19	1.2
Fuel efficiency (%)	Baseline	47%	83%	9% more than open fire	89%	32%

*Test 1: Cooking rice until it was completely done

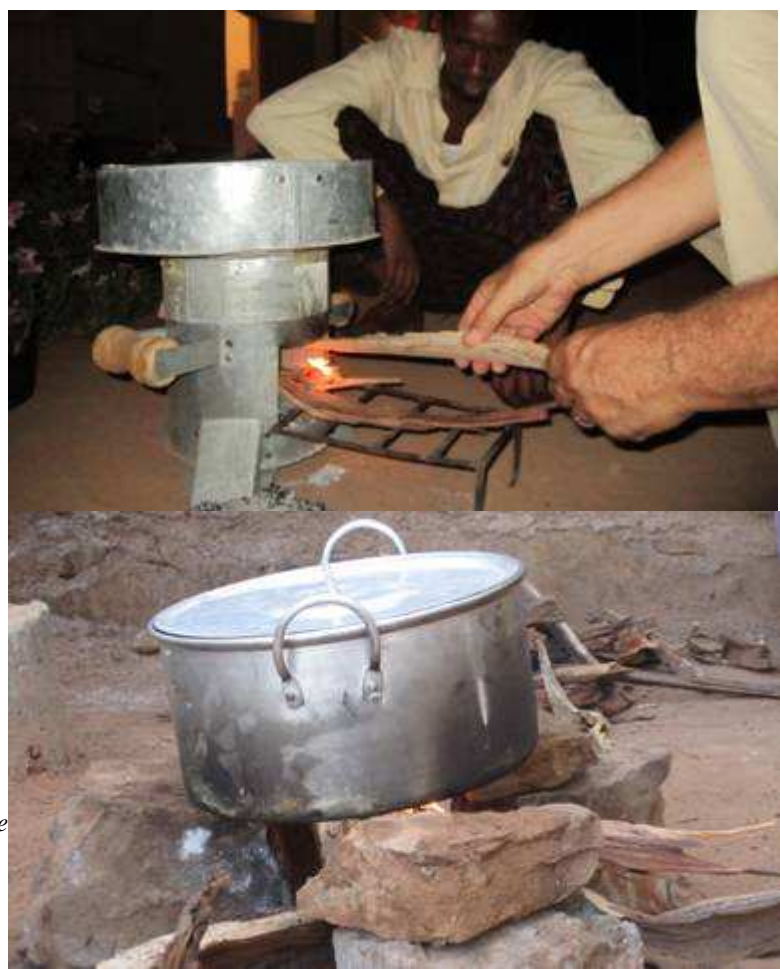
**Test 2: Cooking rice until it starts boiling then removing firewood, letting it continue cooking only with the heat from the ceramic layer of the stove.

- Training is crucial to achieve expected fuel efficiency, as shown in rocket stove test 1 and 2 results.
- Heat retention boxes would be effective for energy saving.
- Multi-fuel stove, due to the long tube shape of the stove, the unused part of the stove consumes a lot of energy, making the overall cooking less efficient.

Conclusion:

Combined use of effective FES together with heat retention box will significantly reduce the amount of firewood used for cooking.

From left to right:
Rocket stove, multi-fuel stove, Save80, Wonderbox



Key Recommendations

Key Recommendations

1. Fuel-efficient stoves (FESs)

- **Follow-up assessment** of rocket stoves is needed. Joint assessment by all the NGOs involved in stove distribution is recommended.
- **Training** is crucial for successful reduction of cooking energy. It would be very useful for all partners involved in stove distribution to work together on training modules and plans including the allocation of animators.
- Stove **maintenance** programmes are needed. Locally manufactured stoves require parts to be replaced regularly, especially the wooden handles and inner ceramic layer due to their frailty. A group of refugees need to be trained on maintenance, which would also lead to income-generating activity.
- **Production capacity** of rocket stoves is to be discussed at Addis Ababa, seeking the possibility to increase production capacity while maintaining stove quality.
- Some **modification** on rocket stoves are needed to be able to bake **Somali injera**, such as the introduction of metallic layer to be able to hold injera pans safely. As many refugees are still using open fire to cook Somali injera, this modification would be appreciated.
- **Heat retention boxes** need to be procured by UNHCR or potential donors, especially as Somali refugees are already familiar with the concept. They call it “Kuleleyse” in Somali, usually made simply with hay basket and cloth/plastic layer.
- **Multi-fuel stoves**, sample already sent to Dollo Ado, are not recommended as they do not save energy. This is due to the long-tube shape of the stove with two pot placements. While only one placement is usually used for cooking, it consumes energy to heat up two pots. The three-legs of the stoves also make them unstable, leaving them vulnerable against wind.
- **Solar cookers** are not recommended unless a dedicated partner comes with a full awareness-raising package.
- LWF is interested to procure and distribute 2,000 **FESs**. Quality and feasibility on use of the stove needs to be assured before implementation.
- **Institutional FESs** to be implemented in all the group cooking places (eg. Health clinic, schools, canteens, feeding centers). Allocating some of the stoves on the way right now (60 units) which is expected to arrive in November is one idea, or local production could be looked into.

2. Fuel

- **Kerosene** distribution will be discussed and confirmed.
- **Training** is crucial to ensure the safe use of kerosene. Pilot implementation is also recommended before starting full implementation.
- A **stable** model of kerosene stove needs to be used as camps are extremely windy.
- **Alternative energy** options will continue to be looked into.

Key Recommendations

3. *Impact Assessment*

Impact assessments before and after the FES intervention are important. Coordination with IRC and other partners who keep track of SGBV and other security incidents related to firewood collection to be ensured and review the impact in a few months after the stove implementation.

4. *Environmental Strategy for Dollo Ado Camps*

While key action plans were established during this mission, a holistic environmental strategy for Dollo Ado camps as well as continuous coordination with partners are needed. As there is no environmental officer based in Dollo Ado currently, having an external resource even on mission basis, or appointing a focal point within Dollo Ado is necessary.

5. *Community Dispute Resolution*

Dialogue between the refugees and host community needs to continue. According to the Community Services team in Dollo Ado, after the security incidents in Kobe and Hilaweyn, ARRA, supported by UNHCR, led meetings to bring refugees, host community, local elders, local government and police together to the same table, and agreed on the mechanisms for future dispute resolution. This approach needs to continue, and different activities to enhance coexistence and awareness-raising should be encouraged.

6. *Improving Nutritional Value of Distributed Grains*

Currently, grains such as wheat and sorghum are distributed unhusked. Refugees have to bring the distributed grains to the local mills to be processed, and they have to give up part of their ration to compensate them. Many refugees also have to pay for transporting distributed grains back to their shelter, as each person is given 16kg of wheat per month. For large families, carrying them home which could be as far as 2km or more, is not possible without hiring donkey carts at their own expense, which often means giving up another part of their ration.

For those who can't afford to bring the grains to the mill, some refugees were witnessed cooking the grains with husks on, which significantly makes it difficult for them to digest, reducing the nutritional value.

It is therefore recommended to collaborate with WFP in distributing grains after unhusking them. The husks may also be used as fuel source, as the successful case study in Bangladesh of compressed rice husks shows.

A donkey cart pool in front of food distribution center



Old woman and her son struggling with heavy food bags



Action Plan

Action Plan

The following action plans were discussed and agreed in Dollo Ado through coordination meetings with counterparts:

1. *Fuel-efficient Stoves (FES)*

- IPs will distribute rocket-type stoves to all the refugee population and surrounding host communities
- Follow-up assessment will be conducted jointly
- Training modules will be established to ensure efficient stove use
- Production capacity of FES in Addis Ababa to be increased if possible
- Institutional FES to be installed in all group cooking facilities eg. feeding centers, transit centers, hospitals, schools. Stoves already procured by OSTs and on the way.
- Heat-retention boxes will be procured by UNHCR. Refugees are already familiar with the concept as «Kuleleyse ». The shape of the Wonderbox might need to be modified according to UNHCR standard kitchen sets.

2. *Solar Lighting*

- IPs will install some solar street lights as a pilot
- IPs will distribute thousands of solar lanterns
- UNHCR will seek additional funding for solar lighting

3. *Fuel*

- Kerosene distribution will start after kerosene supply has been secured and safety ensured. Pilot study and intensive training are to be conducted.
- Ethanol will also continue to be looked into along with Ethiopian government and IPs

4. *Tree Planting*

- Planting of multi-purpose trees including those for firewood will continue to be encouraged with IPs
- Tree-planting for income-generation is to be promoted



Conclusion

Conclusion

Dollo Ado operation has a very good working relationship with the Ethiopian government including ARRA and the host government, NGOs, host communities, and refugee communities. Steady progress has been made in the area of environmental management, including the issue of domestic energy. Further partnership and funding opportunities would be needed to respond to the growing number of refugees in the region.

The case of Dollo Ado would be a good example of locally manufactured FES covering the entire refugee population and host community. Through the establishment of further training and maintenance programmes, this mechanism would be feasible for other operations in need of similar interventions.

Dollo Ado's domestic energy project has also been effective also because it has been taking a holistic approach instead of focusing only on the distribution of fuel and energy-saving stoves. The issue of firewood collection has social, economical, and environmental implications which need to be addressed in parallel. Improvement of environmental management in general, as well as specific activities such as reforestation and coexistence process, are taking place in Dollo Ado, which makes the interventions sustainable.

On the other hand, the environmental situation surrounding Somali refugees in Dollo Ado camps remain vulnerable due to extreme weather conditions and the continued large influx of refugees, leading to the establishment of more refugee camps. Any support for the operation should therefore not be delayed, and further intervention is needed to secure the protection of refugees.



References

References

1. Current Registered Somali Refugee Population

(As of 23 November 2011)

1) Total Somali Refugee Population

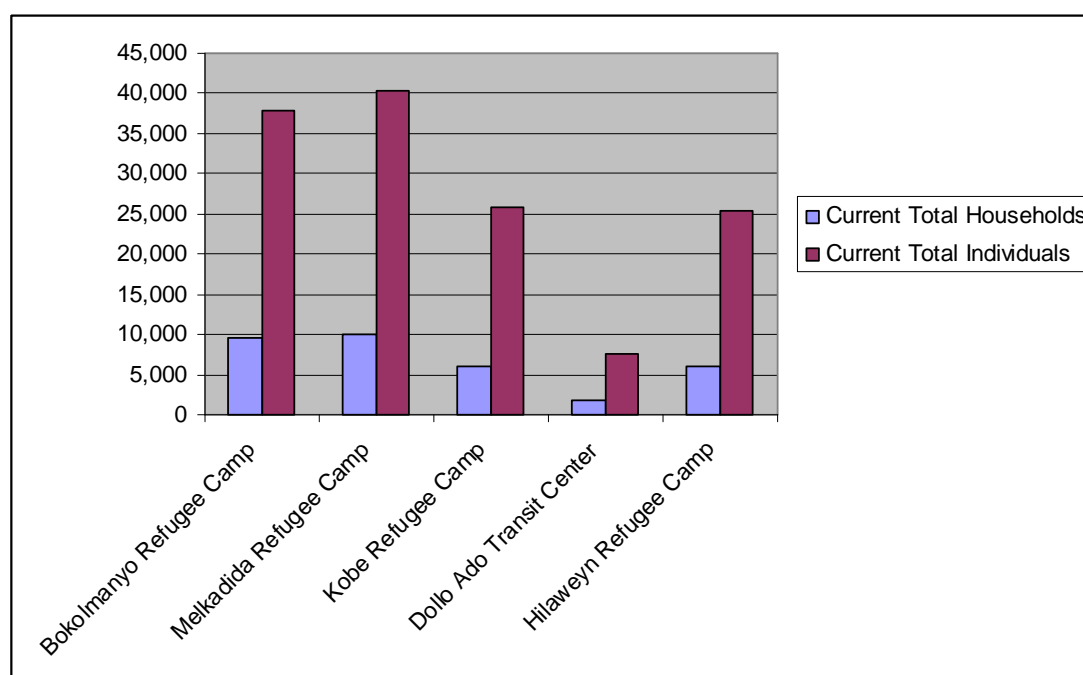
137,068 Individuals

33,290 Households

2) Breakdown by Settlement

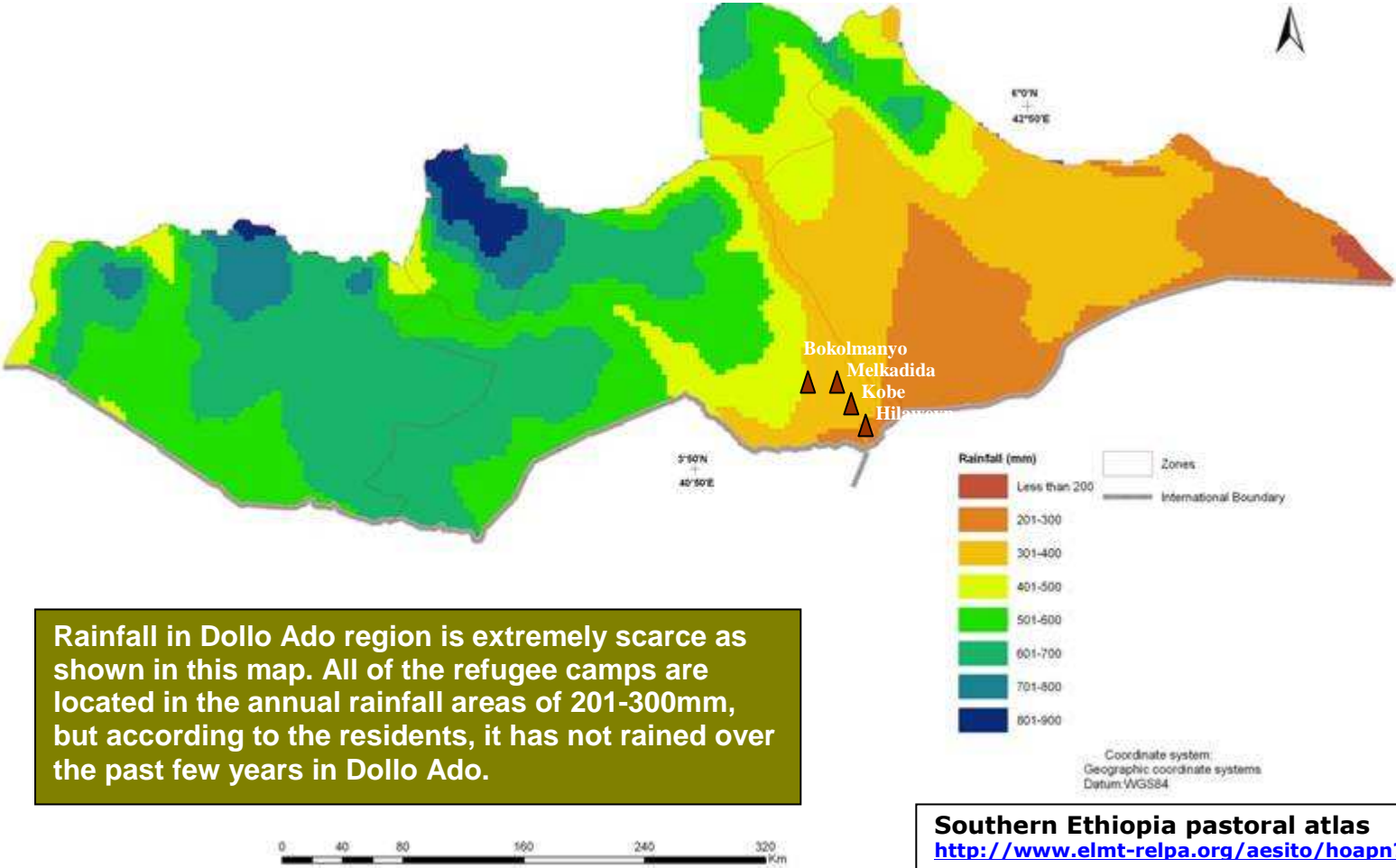
Hilaweyn

Settlement	Current Total		Registered Arrivals in 2011		Updated
	Individuals	Households	Individuals	Households	
Bokolmanyo Refugee Camp	37,803	9,493	22,815	5,505	23/11/2011
Melkadida Refugee Camp	40,260	9,931	14,769	3,479	23/11/2011
Kobe Refugee Camp	25,859	5,908	25,859	5,908	23/11/2011
Dollo Ado Transit Center	7,655	1,893	7,655	1,893	23/11/2011
Hilaweyn Refugee Camp	25,491	6,065	25,851	6,065	23/11/2011



References

2. Rainfall in Dollo Ado



References

3. Water Inventory in Dollo Ado

