WOMEN'S COMMISSION
for refugee women & children

The Perils of Direct Provision:

UNHCR's response to the fuel needs of Bhutanese refugees in Nepal

Women's Commission for Refugee Women and Children

March 2006

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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 levels 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.

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NOTE

Cooking fuel is traditionally seen by both displaced communities and humanitarian organizations as a "women's" issue, since it is a part of the cooking process. Because of this, the burdens associated with its collection fall almost exclusively on women and girls. In refugee and IDP settings worldwide, it has become common knowledge that women and girls are often at the their most vulnerable when gathering fuel, often alone, in remote environments outside the camps.

The Women's Commission for Refugee Women and Children has undertaken a project looking at fuel alternatives that, if used in place of firewood, might help protect refugee and internally displaced women and girls. The main report, *Beyond Firewood: Fuel Alternatives and Protection Strategies for Displaced Women and Girls,* is available at www.womenscommission.org/pdf/fuel.pdf. A case study on Darfur, *Finding Trees in the Desert: firewood collection and alternatives in Darfur,* can be found at www.womenscommission.org/pdf/df_fuel.pdf.

ACRONYMS

AMDA	Association of Medical Doctors in Asia
BRP	Bhutanese Refugee Project (of the Lutheran World Federation)
BRWF	Bhutanese Refugee Women Forum
CFUG	Community Forest User Group
CMC	Camp Management Committee
CRT	Center for Rural Technology
FAO	Food and Agriculture Organization
GBV	gender-based violence (also known as SGBV; sexual and gender-based violence)
IGA	income generation activity
LWF	Lutheran World Federation (Nepal)
NGO	nongovernmental organization
NOC	Nepali Oil Corporation
NPR	Nepali rupee (currency)
NRC	Nepali Red Cross
RAAP	Refugee-affected Areas Rehabilitation Program (of UNHCR)
SCI	Solar Cookers International
UNHCR	United Nations High Commissioner for Refugees
WFP	World Food Program

EXECUTIVE SUMMARY

Approximately 105,000 Bhutanese refugees currently live in camps in eastern Nepal. The majority of the refugees arrived in Nepal in the early 1990s, fleeing increasing harassment of ethnic Nepalis in Bhutan. Most refugees have been living in the camps for over a decade. Thousands of children have been born in the camps, and have never seen the land their parents still consider home.

Locally hired "forest guards" harass refugee women and girls collecting firewood outside the camps, beating them, stealing their wood and personal property, forcing them to pay fines and often imprisoning them despite pleas by the United Nations High Commissioner for Refugees (UNHCR) that they not do so. Refugee girls have been gang-raped and murdered in the forest by opportunists from local communities who know they will not be punished for their crimes.

Despite these graphic stories, however, sexually based attacks on refugee women and girls outside the camps in Nepal occur less often than in many other refugee or internally displaced persons (IDP) settings. This is in part due to UNHCR's long-running direct fuel provision scheme.

In an effort to stave off a worsening of the tensions between the refugee and local populations, UNHCR began providing a weekly kerosene ration to all Bhutanese refugee families in 1992-93. However, though kerosene was in the words of UNHCR "cheap, available and easy to obtain" when the distributions began, the price has more than doubled in the last two years alone, and strikes and blockades imposed as a result of the Maoist insurgency in Nepal have caused frequent scarcities of the fuel and delays in transporting it.

The rapid rise in the price of kerosene has led UNHCR and its main implementing partner, the Lutheran World Federation (LWF), to embark on a major alternative fuel development program, with an abundance of different initiatives in various stages of development. They plan to cease kerosene distribution in early 2006. Because of these wide-ranging, intensive efforts, Nepal can be seen as a sort of "cooking fuel laboratory." The camps present a unique opportunity to carefully study a wide variety of different fuel options, and to weigh their respective advantages and disadvantages.

However, there is much less willingness on the part of refugees to actually use such fuels. This is partly because kerosene is easy to use and satisfies many of the refugee women's preferences for cooking fuel, namely, speed of cooking, ability to cook indoors and flexibility of cooking time and temperature. In large part, however, refugees are reluctant to accept the introduction of alternative fuels because they are reliant on the sale of kerosene as a key source of income. They then collect or purchase firewood to use as cooking fuel.

ALTERNATIVE FUELS IN USE OR UNDER DEVELOPMENT

UNHCR and LWF are hoping to supply at least 50 percent of the refugee population with biomass briquettes (known as "honeycomb" or "beehive" briquettes) beginning in early 2006. The large, single-use briquettes are made from a combination of charred forest waste, filler and a binder such as clay or molasses. Refugees have been extremely reluctant to use the briquettes, however, in part because of the labor intensiveness of the manufacturing process but also because refugees consider the briquettes inferior to kerosene. Key advantages include smokeless burning, the fact that the briquettes can be produced locally (using all local materials) and their relatively low cost. Disadvantages include the labor-intensive production process, the large amount of raw materials needed to make relatively few briquettes, ongoing tension between refugees and host communities regarding use of forest products and the lack of flexibility of cooking time or temperature.

The demonstrations and small-scale trainings associated with the introduction of honeycomb briquettes caused significant confusion among refugees regarding who would be responsible for the collection of raw materials and for producing the briquettes – either the local community or the

refugees themselves. Poorly planned trainings may have contributed to the reluctance of refugees to accept the briquettes.

Despite potential tensions, the involvement of the local community in briquette manufacture is key to the success of the program, because they must permit the use of forest products as raw materials for the briquettes. If the briquette manufacturing process were to be concentrated within local communities, they would receive a tangible benefit, which would promote their continued acceptance of the camps.

Because of the large amount of biomass needed for the honeycomb briquettes, UNHCR has planned to supply the remaining 50 percent of the refugee population with compressed coal dust briquettes, also beginning in early 2006. Refugees appear to be much more accepting of the charcoal than of the honeycomb briquettes, at least in part because charcoal will be distributed – there has been no suggestion that the refugees themselves will be responsible for charcoal production. Unlike the honeycomb briquettes, charcoal provides flexibility of cooking time and temperature, and can be re-used if not fully burnt. Charcoal cooks relatively quickly but produces more smoke than either kerosene or honeycomb briquettes. Further, the manufacturing process itself requires significant energy compared to the amount of energy that the briquettes then produce for cooking. At least initially, charcoal will have to be imported from India, which will increase the cost and potentially be subject to the same transportation delays as kerosene.

There has also been a well-developed parabolic solar cooker program in Beldangi I camp (Jhapa) since the mid-1990s, supported by the joint Dutch-Nepali Vajra Foundation. The refugees use the cookers and are generally pleased with them. Because the cookers have so far been merely a supplement to kerosene, it remains to be seen how successful the program would be in the absence of non-solar alternatives. Solar is also problematic in Nepal as there is only enough sun on 40-60 percent of days during the year to effectively use the cookers – necessitating an additional fuel source and increasing overall cost. Per-unit cost for the parabolic cookers is also quite high, although it declines over time as the cookers require little upkeep and last for many years. The parabolic cookers cook food relatively quickly but require more space than is available in many of the camps.

Biogas, a fuel created from the fermentation of human waste, can be used for cooking or lighting purposes. It is obtained by linking latrines to a sealed, underground biodigester, where the materials ferment. Gas lines transport the gas to nearby homes or institutions. Although it has yet to be actually used in a camp setting, biogas has met with some success in local communities in Nepal and is often mentioned as a possible alternative fuel in some or all of the camps.

DEVELOPMENT OF INCOME GENERATION ACTIVITIES

As noted, a key reason why refugees are so eager to maintain the regular kerosene distribution is because of their reliance on the sale of the fuel as a main source of income. If refugees have other means of earning income, however, they may be more willing to accept other fuels.

Nepali law prohibits refugees from engaging in any type of paid work and from selling any goods they have produced – even within the confines of the camps. In recent years, established income generation activities within camps have been stopped by the district governments after complaints from local vendors from whom the agencies previously bought such goods.

Without the ability to legally earn income, refugee women and girls are more likely to put themselves at risk either by selling their kerosene and collecting firewood as a fuel replacement and/or by subjecting themselves to exploitation and abuse, including gender-based violence, by working illegally.

After a series of false starts in the early 2000s, negotiations regarding an eventual resolution to the Bhutanese refugee crisis are at a standstill – despite the fact that the refugees are eager to return home. The lack of durable solutions to the crisis makes it all the more imperative that UNHCR, the Bhutanese Refugee Women Forum (BRWF) and their partners continue to push for the development and promotion of sustainable income generation activities for refugee women and girls. Without safe opportunities to earn income, women and girls will remain both dependent and vulnerable.

RECOMMENDATIONS

- The international community, specifically UNHCR and donor governments, should pressure the government of Nepal to change the law prohibiting refugees from engaging in income generation activities within the camps.
- UNHCR and Lutheran World Federation-Nepal (LWF) should use a combination of fuels, at least in the short term, after the cessation of kerosene distribution in early 2006.
- UNHCR and LWF should carefully introduce new fuels to refugees to avoid potential misunderstandings about responsibilities for collection and manufacture of such fuels.
- UNHCR should lead a reinvigorated information campaign about the value of the briquettes and the method of collection and manufacture.
- UNHCR and LWF should ensure that the mass manufacture of honeycomb briquettes is well organized if the briquettes are chosen as the primary, long-term replacement for kerosene.
- UNHCR and LWF should continue to develop other types of cooking fuels beyond the honeycomb briquettes since they are not ultimately sustainable as the sole fuel source in the camps in the long term.
- UNHCR should consider promoting solar cookers as a supplement to the various fuels being used or tested. The solar program should only be expanded by UNHCR if outside funding for solar cookers can be secured by the Vajra Foundation or others. Because the initial investment is so high, it would be inadvisable for UNHCR and/or implementing partners to take on financial responsibility for the development of such programs.
- UNHCR should consider establishing biodigesters in surrounding communities to produce biogas to be used for heating and lighting. This would reduce overall fuel needs, and would benefit both refugees and host populations.
- UNHCR and its partners should provide more (non-fuel) rations in order to lessen the refugees' acute need for cash and therefore – at least in part – their reliance on the sale of kerosene for income.
- UNHCR and its partners should also issue blankets and warm clothing in the winter season to reduce the need for kerosene or firewood for heating purposes.
- UNHCR and LWF should promote the use of fuel-efficient stoves in both refugee and host populations. Though stoves are not a solution in and of themselves, they can serve to reduce overall pressure on local forests and open up space for dialogue between the two groups on other, more comprehensive solutions.
- The World Food Program (WFP), UNHCR and LWF should promote the use and distribution of fuel-efficient rations and cooking techniques to reduce the overall amount of fuel needed.

PART 1: BACKGROUND

THE BHUTANESE IN NEPAL

There are approximately 105,000 Bhutanese refugees currently living in seven camps in the Jhapa and Morang districts of eastern Nepal. The majority of the refugees arrived in Nepal in the early 1990s, fleeing increasing harassment of ethnic Nepalis in Bhutan by the ruling government, led by King Jigme Singhe Wangchuk. Most refugees have been living in the camps for over a decade, and thousands of children have been born in the camps, and have never seen the land their parents still consider home.

For the most part, the refugees govern themselves through a system of highly organized Camp Management Committees (CMCs). CMC members are elected by their fellow refugees on an annual basis to positions including camp secretary, camp administrator, gender focal point, etc. The CMCs attempt to deal with most problems presented to them by camp residents, including the concerns of vulnerable persons or families, domestic violence, unaccompanied or orphaned children, and others. They approach UNHCR in a coordinated manner to express concerns about such issues as food and fuel rations or the need for extra construction materials after especially bad rainy seasons. Beyond the CMCs, the camps are managed by the UNHCR sub-office in nearby Damak (Jhapa) – almost all camps have an assigned field protection officer and all are overseen by UNHCR's technical staff, including a gender-based violence (GBV) advisor. UNHCR partners with the Lutheran World Federation (LWF) for infrastructure development and repair, technical implementation and overseeing the Bhutanese Refugee Women Forum (BRWF; see below), the Nepali Red Cross (NRC) for fuel distribution,[1] CARITAS for secondary education, the Nepal Bar Association for legal aid and the Association of Medical Doctors in Asia (AMDA) for health care.

KEROSENE PROVISION

UNHCR began direct provision of kerosene to all Bhutanese refugee families in the camps in eastern Nepal in 1992-93, shortly after the refugees arrived. According to UNHCR representatives in the country office in Kathmandu and sub-office in Damak, there were three main reasons for deciding to provide kerosene to the refugees: the Nepalese Ministry of Forestry informed UNHCR that the refugees would not be allowed to leave the camps, even to collect firewood from the surrounding forests[2]; at the time, kerosene was "cheap, available [from neighboring India] and easy to distribute;" and funding for all types of relief activities, including fuel provision, was relatively easy to obtain early in the emergency, as is often the case.[3] In addition, many of the refugees had used kerosene stoves in their homes in Bhutan, or were at least familiar with the fuel, which also made it a logical choice. Other non-wood fuels at that time were more difficult to obtain and, because the price of kerosene was so low, there was little incentive on the part of UNHCR to seek out alternatives. The use of locally obtained firewood by refugees was forbidden by the government both because the government wanted to maintain enough firewood for use by the local community and because wood – as timber – is an important commodity for Nepal.

For most of the last decade, kerosene has been purchased by the Nepali Oil Corporation (NOC) from neighboring Assam, India. UNHCR buys the fuel from the NOC at a subsidized rate and it is trucked to each camp on a weekly basis in a local tanker. Between 1992 and 1995, UNHCR managed the distribution directly; after 1995 this responsibility was devolved to the NRC as an implementing partner. Within the camps, NRC and the CMCs ensure that the proper rations are distributed to each family, at a rate of two liters per week per family of two, increasing by 0.5 liters per week per additional family member.[4] UNHCR supplies the stoves to refugees through the NRC.

The kerosene stoves distributed by UNHCR are, according to refugee women and UNHCR alike, of very poor quality. UNHCR obtains the stoves from India and replaces them every two years, though

refugees in the focus groups reported that most stoves break within six months.[5] Even when the stoves still work, as they age they become increasingly inefficient, radiating heat and using more kerosene. UNHCR sponsored brief, one-off trainings for refugee women on the use, maintenance and storage of the stoves as well as on the safe use of kerosene fuel shortly after distribution began.

According to UNHCR, until the development and distribution of briquettes in 2006 (see below) the only source of fuel available to refugees apart from kerosene – legally or illegally distributed, purchased or collected – was firewood. It appears that most refugees who use firewood purchase it from the local community in markets that surround the camps. Refugees buying wood in this manner generally receive a receipt and the transaction is legal.

COMMUNITY FOREST USER GROUPS

The Ministry of Forestry oversees a country-wide network of Community Forest Users Groups (CFUGs) throughout Nepal, including in Jhapa and Morang districts. The CFUGs are highly organized groups of individuals from local communities who manage the local forests, including who uses the forests and how, what materials may be collected from the forest and in what amount, and who has permission to collect forest materials. The CFUG in Temai camp, which is located in a large and sparsely populated forest,[6] runs a coupon scheme that permits refugees to collect a specified amount of wood from the forest.

To ensure that the forest or forest materials are not used without permission, the CFUGs also maintain a network of forest guards, who patrol the forests on a regular basis and are charged with finding and detaining anyone caught in the forest without official permission. In order to be released from forest guard detention, the person in custody is generally forced to pay a fine of 500 to 1,500 Nepalese rupees (NPR) (U.S.$6.60 – U.S.$20).

From interviews with camp management staff and refugees, it appears that refugees are among those most often caught and detained by the forest guards. Refugees shared stories of being caught in the forests (sometimes with wood and sometimes without), being beaten by the guards, having their wood or other possessions stolen, and then being forced to pay for their release. In many cases, camp management has had to negotiate with the CFUGs for a refugee's release and/or pay the fine. In order to avoid the forest guards, who typically patrol the forests until 4 p.m., women and girls have been leaving to collect wood at night, increasing their risk of attack by "opportunists" – often teenage boys from the local community.[7]

GENDER-BASED VIOLENCE IN AND AROUND THE CAMPS

According to interviews with UNHCR, the BRWF (see text box, page 6) and with refugees, there have been incidents of gender-based violence (GBV) outside of the camps, including attacks on women and girls collecting firewood. Such attacks, however, have not been on the scale of many other refugee or IDP situations, such as Dadaab refugee camp in Kenya or Darfur, Sudan, and in the words of UNHCR, are "not yet alarming."[8] However, some camps, such as Sanischare Camp, have reported a higher incidence of GBV than others in the region. It is unclear precisely why this is the case, though camps located closer to forests and further from towns appear to be more at risk than those closer to more urban areas. One interviewee also suggested that perpetrators of violence against refugee women and girls outside of the camps often threaten their victims with retaliation against the victims or their families if they report the incident to the CMC.[9]

The main GBV concerns within the Bhutanese refugee community are instead focused within the camps, and include domestic violence, early marriage and polygamy. Outside the camps, key concerns include exploitation of refugees working illegally within local communities and, increasingly, the trafficking of refugee girls to work in Indian brothels.[10]

The above notwithstanding, there have been incidents of GBV, theft and physical assault perpetrated against refugee women and girls collecting wood in forests outside of the camps. According to interviewees, reports of such incidents have been increasing in recent months, as shortages in kerosene supply have necessitated more firewood collection, particularly by those refugees without the means to purchase wood. One interviewee relayed a story of a refugee woman caught by a

THE BHUTANESE REFUGEE WOMEN FORUM (BRWF)

The Bhutanese Refugee Women Forum is an unregistered NGO active in all seven Bhutanese refugee camps in Nepal, with its secretariat located in Sanischare. It began in 1995 and now has more than 2,000 members and 200 voluntary workers, in addition to 90 paid staff filling management and technical roles. BRWF is supported by UNHCR, LWF and WFP, with whom it meets on a monthly basis for program-level discussions.

The Forum's overarching goals are to increase the empowerment and decrease the vulnerability of refugee women. It works to achieve these goals through a variety of activities divided into five main sectors: human resource development; self-sufficiency development; people and development; policy and advocacy; and women's empowerment. Specific programs managed by the Forum include literacy courses, anti-domestic violence training, skills development, leadership courses and income generation trainings.

According to BRWF's Supplementary Income Generation Activity In-Charge, the Forum's income generation activities are aimed at producing goods that can be used within the camps, including jute mats and chalk for use in schools, baby blankets for use by the Association of Medical Doctors in Asia and sanitary napkins and soap for general camp distribution. BRWF is also ready to begin schoolbook-making programs, but cannot do so as yet because the government is increasingly reluctant to allow refugees to undertake any type of productive activities, even within the camps (BRWF's soap-making project was recently shut down).

Since the crackdown on soap and other material production within the camps, BRWF and UNHCR have been undertaking intensive lobbying efforts with the local Chief District Officer and the National Unit for the Coordination of Refugee Affairs (NUCRA), respectively, to allow refugees to at least make and sell goods legally within the confines of the camps. Neither organization has yet been successful (see below for more information on income generation activities).

forest guard, who took her wood and forced her to clean his house before she was allowed to go back to the camp.[11] Some interviewees added that the forest guards get particularly upset at refugees collecting wood since the guards are aware that the refugees are given kerosene by UNHCR.[12] Interviewees at Beldangi II camp went even further, saying that "local people have become the enemy of refugees," illegally taking wood themselves and blaming refugees.[13]

It is unlikely that the provision of kerosene is singlehandedly responsible for the relatively low incidence of GBV outside of the Bhutanese camps, particularly since refugee women and girls do still collect wood with some frequency. However, UNHCR acknowledges that its decision to begin the distribution in the early 1990s was, based on the agency's experiences with GBV in other regions, meant to be preventative. Additionally, UNHCR was intensively focusing on protection of women and girls in all of its activities at the time, having produced its first Policy on Refugee Women in 1990.[14]

The relatively low frequency of GBV outside of the Bhutanese camps as compared to some other refugee or IDP situations seems to be a result of a combination of several factors which include: 1) the decision by UNHCR very early in the crisis to reduce the need for refugees to leave the confines for the camp for fuel collection; 2) strict monitoring and regulation of the forests by the CFUGs; and 3) the ability of refugees to at least occasionally purchase vouchers allowing them to legally collect small amounts of wood.

PART 2: KEROSENE ALTERNATIVES

THE NEED FOR SOMETHING NEW

By the late 1990s, it became clear to UNHCR that kerosene distribution would not be sustainable in the long term. Whereas at the beginning of distribution, kerosene was "cheap, available and easy to obtain," by the end of the decade the price had increased exponentially and was continuing to rise – currently accounting for upwards of 50 percent of UNHCR's annual budget for the Bhutanese in Nepal (roughly U.S.$1.6 million).[15] In addition, increasing activity by the Maoist insurgency in Nepal (including in several of the camps) has caused overall insecurity and unpredictable bandhs (restrictions on movement), making it difficult to transport the kerosene and leading to several weeks-long shortages of the fuel during the last few years.

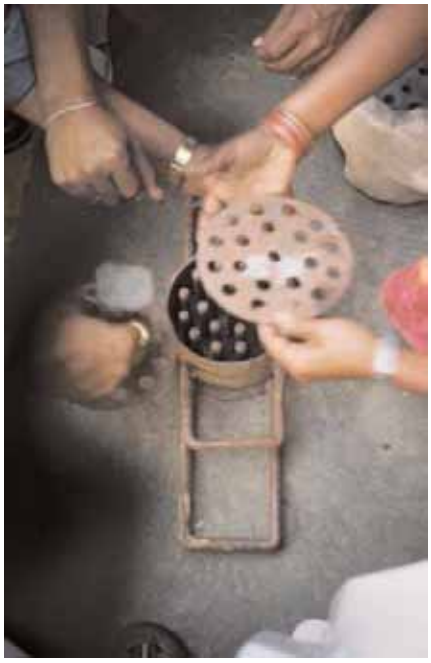
As the price of kerosene increased, so did its value on the local market.[16] UNHCR and its partners have become keenly aware of the increasing propensity of refugees to sell all or part of their kerosene rations[17] and substitute firewood for cooking purposes. In an internal rapid assessment survey conducted by UNHCR-Damak in 2005, 70 percent of refugees reported using firewood as their main cooking fuel.[18]

UNHCR also acknowledges that refugees are choosing to sell kerosene largely because the agency's rations do not meet all of the refugees' needs, meaning they must earn cash in order to purchase items or pay for services (such as clothing or higher education) not supplied by UNHCR or its partners.[19] The increased collection of firewood by refugees, however, has increased tensions with the government, as well as with local communities and the CFUGs, resulting in more attacks on refugees found in the forests.

With all three of UNHCR's key reasons for choosing to distribute kerosene at the beginning of the refugee crisis no longer applicable, and tensions with the government and local communities increasing as a result of refugees' collection of firewood, the agency and its partners first decreased the total kerosene ration. When the smaller ration still did not make up for the total increase in price, the agency and several national and international NGOs embarked in 2004-2005[20] on an intensive search for an appropriate alternative fuel. As UNHCR staff explained, if the agency is going to spend money on fuel, it prefers to spend it on a minimum amount of expensive kerosene and use the rest for a larger amount of an alternative fuel.[21]

I. Briquettes

"Honeycomb" or "beehive" briquettes are made from a combination of forest waste (usually an invasive weed called banmara)[22]; soil or sand and, often, rice husks as filler; and a binding material such as clay or, sometimes, molasses where it is available. During demonstrations on briquettes in the camp, the manufacturing process was labor-intensive and small-scale in nature: collection of raw materials, charring in pits or metal drums (where available), grinding into dust and mixing with a binder, such as clay or molasses, by hand, placing the pasty mix of 80 percent char and 20 percent binder[23] into a single-briquette mold and pressing into form by hitting the mold with a hammer. The briquettes are then dried in the sun



Trainee demonstrating the use of the single-briquette press for the honeycomb briquette.

for up to four days. The entire process, including collection of raw materials and drying, takes approximately 10 days (the longer the briquettes are allowed to dry, the more efficiently they burn). Waste briquettes can be used as fertilizer.

According to LWF, one person can make 16-17 briquettes per day using the single-briquette mold (a typical Bhutanese meal requires 1-2 briquettes to cook). Different organizations both inside and outside Nepal have developed more sophisticated, larger-scale and less labor-intensive means of producing the briquettes, such as bigger charring drums and screw-press machines. In Nepal, the Center for Rural Technology (CRT) has taken the lead on developing mass-production methods for briquettes, adapting Japanese technology for use in the Nepalese context. The more industrialized the process, however, the more expensive the start-up costs. The intensive capital investment required for mass production of briquettes would make more sense were the entire production concentrated within local communities, with the machinery sold to pre-existing or start-up manufacturing centers at a subsidized rate.

The development of briquette or other fuel-production industries within the local population could also have a positive impact on relations between refugee and host populations, since the host populations would realize a direct benefit from the presence of the refugees. However, many interviewees – including CMC members – also expressed significant concern that anti-refugee sentiments would cause local producers to purposely make lower-quality briquettes (increasing the binder-to-char ratio). There is no evidence that such a problem would indeed arise, but it provides important insight into the level of suspicion between the two groups.

These concerns could be alleviated, at least in part, by encouraging co-production of the briquettes, that is, developing local capacity to collect and process the raw materials, including charring and grinding. The char dust could then be transported to the camps, where refugees themselves would be responsible for mixing the dust with binder and pressing the actual briquettes. Such a scheme would necessitate infrastructure investments within both local communities and in the camps, and would also serve to build capacity and encourage cooperation among both populations. Rather than direct subsidies, micro-credit schemes could be used to support the development of local production factories, increasing the likelihood of sustainability even after the eventual resolution of the refugee situation.

Honeycomb briquette in specially designed mud stove.

II. Biogas

Biogas is a fuel created from the fermentation of human (or occasionally animal) waste, and can be used for cooking or lighting purposes. It is obtained by linking latrines to a sealed, underground biodigester, which can be of varying sizes depending on the number of latrines to which it is linked. The materials ferment within the biodigester, and gas lines transport the gas from the digester into nearby homes or institutions. Once the process is completed, the leftover slurry can be used as fertilizer. Though it has yet to be actually used in a camp setting, biogas has met with some success in local communities in Nepal and is often mentioned as a possible alternative fuel in some or all of the camps.

UNHCR looked into the possibility of developing biogas as an addition or alternative to kerosene in the mid-1990s, commissioning a feasibility study by Consolidated Management Systems (CMS) Nepal, a private company. CMS began a pilot project in Pathari, a small town near Sanischare camp, with the aim of supporting a refugee-affected area by providing a subsidized alternative to firewood. Though the bio-latrines proved to be popular, the gas itself was not: the community

accepted it for use in lighting but not for cooking, as the gas was considered to be impure and unacceptable for cooking purposes.

Apart from the issue of acceptability, biogas has proven to be difficult to implement in camps in Nepal, as the Nepali government does not permit the establishment of any permanent structures within the camps. Since biodigesters require significant capital investment and infrastructure,[24] and are buried underground, they are considered permanent. They also take up significant space, which is already at a premium in the Bhutanese camps.

This is not to suggest that there is no role for biogas in Nepal. Rather, the fuel might be more suitable for use in refugee-affected areas than in the camps themselves for several reasons: 1) the establishment of permanent structures within Nepali villages should be accepted by the government and/or could be managed by a private group, cooperative or similar; 2) there is generally more physical space available in rural villages than in camps; and 3) the expenditure of significant upfront capital is less controversial or problematic.

The issue of acceptability may be overcome if installation of the biodigester is accompanied by well-designed information campaigns about the cleanliness of biogas and the financial savings and other benefits (free fertilizer, better crop yields, improved sanitation and hygiene, less pressure on forests, etc.) that will accrue to its users. Even if campaigns are not able to convince potential users of the acceptability of biogas for cooking, it could instead be used primarily to offset other energy needs such as lighting or heating, thereby serving to reduce overall fuel needs within refugee-hosting communities and in so doing, relieving some of the pressure on local forests.

Some camps in Nepal, such as the Beldangis, are bordered by villages – which raises the possibility of constructing a biodigester on village land for use by both populations. The issue of space constraints may still arise, as could tensions between host communities and refugees. However, engaging the two groups in a jointly managed project beneficial to both could also serve to build constructive relationships.

III. Solar cookers

The Vajra Foundation is a joint Dutch-Nepali foundation supporting a variety of education, health and environmental protection projects throughout Nepal, including in rural areas and refugee camps. It began a large-scale solar cooking program for refugees in Beldangi I camp in 1998, eventually providing 548 cookers for use by 75 percent of the camp population, at a ratio of one cooker per four families.

Vajra began its solar project using the box cooker model, which is a wooden box lined with a reflective mat on the bottom, insulated sides and an adjustable glass top. All materials needed to construct box cookers were available in the local markets, and the average per-cooker cost was NPR 2275 (U.S.$30). However, box cookers are very slow cooking (taking approximately 2.5 hours per small pot of food) and broke frequently – particularly the glass tops. Maintenance and repair therefore became expensive. Over the course of the year in which Vajra actively distributed box cookers, it found that the refugees were often not repairing the cookers if they broke, casting them aside in favor of using strictly (free) kerosene. The foundation therefore decided to switch to a different model, the SK-14 parabolic cooker.

Parabolic cookers are large dishes made up of interlocking reflective plates. The dish is mounted on a rotating frame and a single,[25] insulated, black-painted pot is suspended in the center of the dish in order to absorb the maximum amount of solar energy.

Parabolic solar cooker being used in Beldangi I camp.

All materials required for constructing the parabolic cookers are available in Nepal except for the reflective plates themselves, which come from Germany but are assembled locally, and the pots, which are purchased in India. According to the Vajra Foundation, the last set of 300 parabolic cookers took approximately three months to make.[26] The users themselves paint the pots black, and repaint them when necessary.

Parabolic devices cook much more quickly than the box cooker model – roughly 45 minutes to one hour for a full family meal, according to tests conducted by Vajra representatives and to refugee women interviewed by the Women's Commission. One liter of water will reach a boil on a parabolic cooker in 15 minutes – about the same amount of time as on a kerosene stove. However, the parabolic cookers must be turned every five to ten minutes to follow the most direct rays of the sun, making the cooking process somewhat labor intensive.[27]

Refugees apply to the Vajra Foundation to receive a cooker, and must pay NPR 150 (U.S.$2) to receive it.[28] They are then given a one-day training in use and maintenance of the cooker and pot by the vice-chairman of the Vajra Foundation-Nepal. According to Vajra, the cookers are so popular in Beldangi I that there is currently a waiting list. During the Women's Commission's visit to the camp – which occurred on a sunny day – the cookers were clearly being heavily used. The Vajra Foundation has also set up and supports users groups, which meet on a monthly basis to discuss problems they may be having with the cookers, learn additional maintenance and repair techniques and report on the weather. If there are problems with any of the cookers, Vajra's local staff will help the refugees fix them.

The Vajra Foundation has estimated that each cooker costs NPR 9,500 (U.S.$120), including transportation and assembly as well as the stand, cooking pot and haybox (see text box, page 11).[29] The foundation currently has sufficient independent funding to cover approximately 80-90 percent of the total solar cooker requirements in all seven Bhutanese camps at a maximum ratio of one cooker per two refugee families.[30]

Refugee woman explaining the use of her solar cooker in Beldangi I camp.

As in many other locations, one of the biggest problems with solar cooking for the Bhutanese refugee population is acceptability. It is difficult to gauge how pervasive this problem really is, however, since refugees interviewed by the Women's Commission were so clearly reluctant to accept or even to express positive sentiments about any type of cooking fuel other than kerosene. Even the fact that the cookers were indeed being widely used in Beldangi is not necessarily a predictor of their overall acceptability, since at the time of the Women's Commission's visit solar energy was still only a supplement to kerosene rations. It is conceivable that users' opinions of the solar cookers would change were solar to become the predominant source of cooking fuel.

An additional problem with solar energy is the lack of strong enough morning sun to use the cookers for breakfast. Refugee women interviewed by the Women's Commission did not like the fact that they could not use the solar cookers to cook breakfast for their children before school. Some users also complained that they could not use the cookers in the evenings for the same reason, though proper use of the haybox should address this problem.

A cultural barrier to solar cookers that could prove difficult to overcome, however, is that Bhutanese women believe cooking outdoors is unhealthy. Information campaigns regarding the high risk of respiratory infections and other

HAYBOXES

A haybox is in actuality more of a basket. It is made primarily of straw, banana leaves or other strong organic material, insulated with wool and lined with plastic. The Vajra Foundation currently distributes one haybox per family that uses a solar cooker, meaning there is no wait or potential scheduling problems for the haybox.

During use, the pot is wrapped in an insulating blanket (similar to the mats used by people in the region as mattresses) and placed in the box, which is then covered and typically placed on the roof of the user's hut. A haybox will keep food warm for up to 9 hours and can even finish cooking food - such as rice - if properly used, meaning that women should be able to cook evening meals during the daytime, and still serve them hot well into the evening.

A haybox in Beldangi I camp.

health problems associated with smoke from indoor cooking (particularly for children) could help to convince some mothers that it is actually more unhealthy to cook inside, but this could take some time.

Although the parabolic cooker seems to overcome the most common complaint regarding solar cookers – that they cook too slowly – it is still far from a perfect solution for camp situations. Perhaps the biggest problem is the size of the cooker – the dish itself is roughly one and a half meters in diameter, and the full device is close to two meters tall when set up on its frame. Though Beldangi I and a few of the other Bhutanese camps have some space between huts and/or available land around the outskirts of the camps, this is not the norm for most refugee or IDP camps in the rest of the world – space is almost always at a premium, particularly as displacement situations become protracted and camp populations grow. Vajra has discussed the possibility of placing all cookers in a single, dedicated area in order to save space, but most refugee women have rejected the idea as being too inconvenient. Communal cooking has also been rejected.

Currently there is only one cooker available for use per four families,[31] meaning the women must carefully schedule their use of the cooker. Though refugee women in focus groups were reluctant to discuss scheduling problems in great detail, it was clear that there were often problems in determining which family would use the cooker at which time. An interviewee privately told the Women's Commission that higher-caste women often refused to let lower-caste women share their cookers, leaving the lower-caste women without access to a cooker.

Even if solar cookers were to be totally accepted by all refugees in all camps in Nepal, some sort of additional cooking fuel would still be required: the Vajra Foundation found that solar energy would only be viable as the sole source of cooking fuel in the region for an average of 34 weeks per year – meaning something other than solar would be required for the remaining 22 weeks (42 percent of the time).[32] In the words of a Vajra representative in Nepal, "a solar cooker will never be 100 percent of the solution."[33] Vajra has estimated that one solar cooker would cover 55 percent of the cooking requirements currently being met by kerosene – meaning one cooker would save an average of 150 liters of kerosene per year.[34]

Of course using solar for more than half the year would significantly reduce the need for firewood collection, thereby simultaneously helping to protect women and girls and lessening pressure on local forests. The fact that a second fuel would be necessary, however, means that wood or other fuel would still have to be collected or purchased for more than one-third of the year, or that there would be significant fuel-related costs to agencies in addition to the high cost of the solar cookers themselves.

The cost issue could be offset in Nepal by the fact that Vajra has enough independent funding to cover the initial cost of almost all the solar cookers that would be required in the camps in Nepal, meaning UNHCR would only have to supply fuel for approximately 22 weeks per year, much less than it currently provides. While this scenario might work in Nepal for the time being, it is not necessarily replicable in other regions, nor does it appear that Vajra's independent funding is limitless – raising the question of what would happen when cookers eventually need to be replaced.

The Vajra Foundation itself has expressed concern about the sustainability of a large-scale solar project in the camps without UNHCR or other partnerships.[35] To this end, Vajra has discussed with LWF the possibility of combining solar cookers and bio-briquettes. Such a combination could address a shared problem of both fuels, since the raw materials needed to make the briquettes are, like solar energy, not available year-round. At least one bio-briquette trainee interviewed by the Women's Commission was amenable to the idea of combining briquettes and solar cookers, though she added that both fuels were time and labor intensive.[36] At the time of writing, no formal agreement between Vajra and LWF had been reached.

IV. Improved stoves

As noted above, LWF has been actively involved in designing new models of stoves for use with the honeycomb briquettes and/or stoves that can be converted for use with a variety of different fuels, such as honeycomb briquettes, charcoal and firewood. LWF has been experimenting with different materials, including mud, clay, galvanized steel and combinations thereof. The stoves that are most likely to be feasible for use in camps from a cost and production standpoint are those made of locally available materials.

One such stove currently under development by LWF is a so-called "flowerpot stove." The flowerpot stove is a combination metal-clay stove designed for use with the honeycomb briquette. It consists of a typical, pre-manufactured clay flowerpot with the pot bottom removed. The briquette rests in the flowerpot, which is then placed inside a galvanized steel bucket with a metal grate used to separate the bottom of the bucket from the base of the flowerpot. The top of the pot and bucket are sealed with a binding material, and a "door" is cut into the bucket to allow for air circulation – the larger the door, the hotter and faster the briquette will burn. This model of stove costs approximately NPR 160 (U.S.$2.13) to produce, though the cost would decline to NPR 130-140 (U.S.$1.75-1.85) per stove with large-scale production.

Other local and regional organizations have also been working to develop fuel-efficient, wood-burning stoves for use in rural areas of Nepal, including in refugee camps. The Center for Rural Technology (CRT), for example, has been the government of Nepal's national implementing partner for the promotion of improved stoves in Nepal since 2,000. In five years, CRT has distributed approximately 145,000 stoves throughout Nepal, training local women to build and maintain them and then employing the trainees as "promoters" of the technology. CRT's stoves are made entirely of abundant and locally available materials such as bricks and clay. The general stove design is similar to a traditional Nepali stove, and therefore familiar to users. The users are required to pay a small fee (between NPR 250 – 500; U.S.$3-6) for the stove to cover the cost of materials as well as to instill a sense of ownership – meaning the only stove-related cost for CRT is the fee paid to the promoters.

CRT's stove model is designed both to improve fuel efficiency and to reduce smoke. Tests have shown that the stoves can reduce firewood consumption by between 30-50 percent with proper use, and burn almost smoke-free.[37] Using less firewood not only reduces the risks associated with firewood collection,[38] but frees up time for women and girls who would otherwise be collecting wood – allowing more girls to attend school, for example.

Fuel-efficient wood-burning stoves are unlikely to play a key role in the search for fuel alternatives in the Bhutanese camps in Nepal – at least in the

short term – due to the continued reluctance of the CFUGs to allow any systematic use of firewood in the region. However, since it appears there will be no single fuel solution to the current problems, and refugees continue to rely on firewood despite regulations to the contrary, it would make sense to support the spread of fuel-efficient stoves as widely as possible. Not only is the technology easy to use and the materials abundant and inexpensive, widespread use of fuel-efficient stoves in both refugee and host populations can help to reduce overall pressure on local forests – something in which both populations have a stake.

V. FUEL-EFFICIENT RATIONS AND COOKING TECHNIQUES

Two more points that should not be overlooked are non-fuel rations and fuel-efficient cooking techniques. Seemingly unrelated, both points in fact highlight the issue of using less fuel, regardless of the type.

This is particularly the case with regard to clothing and blankets: countless refugees interviewed by the Women's Commission said they used much of the income they earned to purchase sweaters and blankets for use during winter, since such items were no longer provided by UNHCR. It appears as though kerosene may also be used to a limited extent for heating purposes and/or that more firewood is collected in the winter to be used for heating purposes. This need could be eliminated by the (less expensive) provision of blankets and/or warmer clothing. Blankets and sweaters could serve a dual purpose if they were made by refugee women themselves as an income generation activity, if such activities were allowed by the Nepali government.

Teaching refugee women fairly simple techniques to save fuel during cooking also has a small, yet important, payoff. Such techniques include – but are not limited to – soaking beans and lentils in water before cooking, cutting meat and larger vegetables into smaller pieces to speed cooking time, and using only dry firewood. The knowledge of such techniques exists within the camps, and BRWF offices and courses could provide the venue for promoting such discussion. The Bhutanese refugee population is also familiar with the use of pressure cooker pots, which also serve to reduce overall cooking time and therefore fuel consumption.

Rehabilitated forest outside Beldangi I camp, Nepal.

PART 3: WHAT'S NEXT?

THE SWITCH TO BRIQUETTES

UNHCR has decided to cease most kerosene distribution as of January 2006. Charcoal briquettes will replace kerosene as the main fuel source in four of the camps, as local communities and/or refugees are trained to make honeycomb briquettes. Refugees appear to be much more accepting of the charcoal than of the honeycomb briquettes, at least in part because charcoal will be distributed – there has been no suggestion that the refugees themselves will be responsible for charcoal production. Unlike the honeycomb briquettes, charcoal provides flexibility of cooking time and temperature, and can be re-used if not fully burnt. They cook relatively quickly but produce more smoke than either kerosene or the honeycomb briquettes. Further, the manufacturing process itself requires significant energy compared to the amount of energy that the briquettes then produce for cooking. At least initially, charcoal will have to be imported from India, which will increase the cost and potentially be subject to the same transportation delays as kerosene.

Over the course of the year, the agency and its main implementing partner, LWF, will begin supporting the manufacture and distribution of honeycomb and compressed coal dust briquettes, while continuing to supply one liter of kerosene per family per month for lighting purposes. For the first three months of the new program, it is anticipated that UNHCR will purchase the coal dust briquettes from India and distribute them through a refugee-run distribution committee on a per-household basis, in a similar manner to the previous distribution of kerosene. During these three months, UNHCR and LWF will simultaneously work to develop the capacity of local producers to manufacture the honeycomb briquettes. By July 2006, the goal of UNHCR and LWF is to involve both refugees and host communities in the production of honeycomb briquettes, eventually achieving full local production.

Initially, UNHCR and LWF will supply the refugees with specially designed mud stoves for use with the briquettes, though the agencies hope to train refugee women over time to make the stoves themselves. As discussed above, LWF is also working to develop improved stoves for use with the briquettes, including more efficient metal-clay models and "3-in-1" stoves.

According to UNHCR, the agency approached refugees directly – through women's groups, the CMCs, sector heads, etc. – to ask for their input on acceptable alternative fuels. Perhaps due to their reluctance to accept any fuel other than kerosene, the refugees offered few viable suggestions. UNHCR then studied fuels that had been used by the government of Nepal as well as by relief agencies in other countries such as Bangladesh and Thailand in order to determine what might work in the Bhutanese camps.

UNHCR eventually chose briquettes as the main replacement for kerosene for a variety of reasons: the Nepalese government had already undertaken briquette programs, and a nearby university group was available to undertake test projects and demonstrations in Beldangi and Sanischare camps. LWF also managed its own feasibility study and has, as noted, been working to develop improved stove models for the briquettes.[39] In addition, the materials used for the briquettes are locally available and inexpensive,[40] and the briquettes themselves can be manufactured by local communities and/or within the camps themselves, thus avoiding potential difficulties with transportation. Lastly, the biomass material used for the briquettes – banmara – is damaging forests throughout the region, and its mass collection can help alleviate the environmental problems it causes – a 2-for-1 solution.

The involvement of the local community in briquette manufacture is key to the success of the program. First, UNHCR and its partners must obtain the permission of the local CFUGs to collect the raw materials: providing a financial incentive for doing so makes it easier to obtain. Whereas the CFUGs would normally pay to have the banmara removed, it would be cleared for free and have financial value in and of itself. Making the local community responsible for collecting the banmara is also an important way to avoid

potential misunderstandings or even conflict between local communities and refugees.[41] Nearly all refugee women interviewed in separate focus groups in four camps made it clear that briquettes would not be a viable option if the refugees had to collect the raw materials themselves.

Second, the processing of the materials into either char or the actual honeycomb briquette is an income generation activity for local manufactures, since UNHCR will then purchase the material from the local producers for distribution within the camps. It is also conceivable that some of the briquettes might also be purchased by the local communities, particularly if mass production can make a briquette less expensive than the equivalent amount of firewood. Lastly, by simultaneously reducing pressure on and improving the conditions of the forest as well as creating an income generation activity for local communities, briquette production may help reduce tensions between local communities and refugees.

ACCEPTANCE BY REFUGEES

The refugees themselves are extremely reluctant to accept the switch to briquettes or, for that matter, to any type of fuel other than kerosene. In interviews, UNHCR field staff suggested that though refugees were initially "completely resistant" to any fuel other than kerosene, over the course of 2005 they were beginning to at least accept the idea that a new fuel might eventually be necessary. The increased acceptance may be due in part to intensive information campaigns undertaken by UNHCR to explain the reasons behind the switch and the dangers associated with collecting firewood. It is perhaps even more a result of the increasingly common and ever-longer interruptions in kerosene supply caused by the transportation bans. The irregular supply has forced refugees to get used to not having kerosene to use or sell – thereby providing an incentive for the acceptance of a new fuel.

Accepting the need for a new fuel is one thing; accepting the new fuel itself is entirely another. In group discussions, refugee women expressed significant practical concerns about the briquettes, beginning with the production process. According to two participants in LWF's initial briquette-making trainings in late 2005, the collection and production process was "long and difficult," and both women were very concerned about the reaction of the local community and particularly of the forest guards were they to have to collect additional forest materials in the future.[42] Despite the "from scratch" trainings, however, it does not appear that either UNHCR or LWF intend for refugee women to collect or process the raw materials when the briquettes are introduced on a large scale. It is clear from interviews that this fact was not sufficiently explained to the trainees – and may now be impeding the willingness of refugee women to accept the briquettes. UNHCR's information campaigns during late 2005-early 2006 may help to dispel this misunderstanding.

Many of the women interviewed by the Women's Commission also noted that there is no flexibility in cooking with the briquettes, either in terms of temperature or burning time. Once a briquette is lit, it will burn for 50-80 minutes and cannot be extinguished and re-used. The briquettes are impractical, therefore, for cooking a small meal or for just boiling water for tea. Similarly, if a full meal[43] for a large family requires a total of 90 minutes of cooking time (commonly the case, according to interviews with refugee women), two full briquettes must be burnt – even if the second is only needed for 10 or 15 minutes.[44]

The above notwithstanding, it did appear as though refugee women who had participated in the trainings were more willing to at least try alternative fuels, and agreed that any fuel – even the briquettes – was better than nothing. Women who had used the briquettes were generally pleased by the fact that they burned without flame or smoke and were therefore safer for use around children, though interviewees were also generally quick to add that they still preferred kerosene to the briquettes. Some trainees also clarified that they were happy to have learned how to make the briquettes, since any chance to learn a new skill is good, but that they will not actually use the briquettes they have made as long as they still have access to kerosene. Interviewees also stressed that their acceptance of briquettes would be heavily dependent on the quality of the briquettes, and echoed the concern of some of the camp leaders that local producers could be apt to make poorer-quality briquettes in order to save money. It remains to be seen how the general refugee population will accept the switch as it plays out during early 2006.

The switch to briquettes also raises concerns about

the quantity and sustainability of biomass available in local forests. The briquettes require a large amount of raw biomass – according to LWF, 14 kilograms of raw biomass will yield about 4 kilograms of useable char, which in turn will make eight briquettes for a maximum of 10 hours 40 minutes of cooking time. With at least two briquettes needed per family per day, this calculation suggests that each refugee family will use at minimum the equivalent of 3.5 kilograms of raw materials every day.

This is a significant amount of biomass, whether from an invasive weed or not. LWF has estimated that locally available biomass will only be able to cover approximately 25-50 percent[45] of the total need – clearly not a full or long-term solution. Additional biomass is likely to be available in other regions in Nepal and/or in India; any materials brought in from outside the immediate vicinity would be subject to the same transportation problems and potential irregular supply as was kerosene[46] – not to mention the increased expense.

UNHCR is aware of this problem and is attempting to solve it – or at least delay eventual shortages in honeycomb briquettes – by using only coal dust briquettes in three of the seven camps (the Beldangis), covering 50 percent of the total refugee population and thus reducing the overall amount of biomass collected. The four camps chosen to use honeycomb briquettes are those located the closest to large, sparsely populated forests.

From UNHCR and LWF's perspective, the briquettes present several logistical problems: namely, they are difficult to transport (they crumble easily) and to store (they must stay dry in order to remain usable – a particular problem during the rainy season). CRT has suggested that briquettes can be made stronger, and therefore easier to transport, by using a better binder – such as molasses or flour waste from mills. UNHCR and LWF have also been devising drying machines, plastic casing and other means of storing the briquettes, though most of these solutions increase the per-briquette cost. Co-production of the briquettes by local manufacturers (collection of raw materials and processing into char dust) and refugees themselves (mixing char and binder and pressing the briquettes) could also help to address problems of transportation and storage, since only the char dust would need to be transported, and the briquettes themselves could be made on a smaller-scale basis, reducing the need for long-term storage.

Lastly is the problem common to all charcoal and briquette-based fuels: they typically require more energy to produce than they emit during use. This fact may be less important in areas where fuel in general is not scarce and/or where the production cost of fuel is less a priority than obtaining the fuel: the former is the case in Nepal. In other displacement situations, however – particularly those in arid and/or very remote environments – energy itself may be the primary concern. In such cases, charcoal or other types of briquettes would not be a logical choice. As even LWF admits in Nepal "[briquetting] isn't a fuel-saving technology."[47]

PART 4: THE NEED FOR INCOME

As discussed above, the Nepalese government has strict laws in place that prevent refugees from engaging in any type of income generation activities, including within the camps and even those that are produce goods for the refugee population or relief agencies. Skills-building and vocational training programs are justified on the grounds that such skills could be useful after the refugees' eventual return to Bhutan, but the refugees cannot legally sell any items produced as a result of the programs nor engage in any type of paid work. After more than 10 years of vocational trainings, the refugee population in general – both women and men – has a wide range of well-developed skills and abilities but cannot use them to earn income.

UNHCR and LWF have managed some small programs through BRWF whereby refugee women are trained to make goods for use in the camp, such as soap and sanitary napkins. UNHCR then purchases the goods from the women and re-distributes them inside the camps. Some programs have been successful, particularly those that are small enough to "fly under the radar" of the local and district government.[48] However, those programs – such as soap making – which must be done on a large scale in order to be practical, came to the attention of local producers (from whom UNHCR originally purchased soap), who in turn complained to the district government, and have been shut down. Regardless, WFP and BRWF have several years of experience with very small (maximum NPR 5,000 [U.S.$67] per woman per year) micro-credit schemes for supporting small, women-run businesses inside the camps. Such businesses have included beauty parlors, vegetable selling, butter making and others. Though limited, this experience can and should be harnessed.

The lack of available income generation activities has direct implications for firewood collection and, therefore, for the potential risk to refugee women and girls. Without the ability to legally earn income, women and girls are more likely to put themselves at risk either by selling their kerosene and collecting firewood as a fuel replacement and/or by subjecting themselves to exploitation and abuse by working illegally. As BRWF explains, lack of income inhibits the agency's goal of increasing the empowerment and decreasing the vulnerability of women. Without income, women are more dependent on men and on relief agencies – and increased dependency is almost always accompanied by increased vulnerability.

The Bhutanese refugees have developed both marketable skills (furniture making, bicycle repair and beauty shops, for example) and saleable goods (such as soap, sanitary napkins, baby blankets, butter, vegetables and Dhaka cloth) for which there are identifiable in-camp, local and regional markets. The major need in Nepal, then, is for a change in the law to at the very least allow refugees to work legally and produce goods for sale/distribution within the camps.

It is likely that changing the law may negatively affect local suppliers of certain goods in the short term – though such losses may at least be partially offset by the creation of new income generation opportunities for the local community, such as the production of biomass briquettes. Regardless, there is no excuse for continuing to force refugees into a state of total dependence (on insufficient and decreasing rations) more than a decade into their displacement – particularly since the government is not currently entertaining any practical solutions to the refugee problem.[49]

PART 5: CONCLUSION

The 105,000 Bhutanese in Nepal constitute one of the most protracted refugee situations in the world today – most having lived in the camps for more than a decade.

Until early 2006, UNHCR supported the direct provision of kerosene to all Bhutanese refugee families – meaning, in theory, that there was no need for refugee women and girls to collect firewood. In reality, however, many women and girls sell their kerosene rations to earn much-needed income, and collect wood for personal use. Despite such collection and increasing tensions with the local population, reports of sexually based attacks on women and girls outside the camps in Nepal occur less often than in many other refugee or IDP settings.

The frequency of kerosene sales points to the profound need for income among refugee women. The population is relatively well educated and highly skilled, having participated in more than 10 years of trainings and skills-building courses. However, Nepalese law does not permit refugees to legally engage in paid work or to sell goods for income. UNHCR and BRWF are actively lobbying for a change in the law to at least allow refugees to work within the camps, but so far such efforts have not been successful.

Because of rapidly rising costs, UNHCR has begun phasing out the direct provision of kerosene to the Bhutanese refugees. Instead, a variety of different coal- and biomass-based briquettes are being tested and distributed. In addition, UNHCR, NGOs such as LWF and CRT, and the Vajra Foundation are actively developing and promoting fuel-efficient and alternative fuel technologies, such as new designs for fuel-efficient stoves and large-scale distribution of solar cookers. Because of these wide-ranging, intensive efforts, Nepal can be seen as a sort of "cooking fuel laboratory." The camps present a unique opportunity to carefully study a wide variety of different fuel options, and to weigh their respective advantages and disadvantages.

After a series of false starts in the early 2000s, negotiations regarding an eventual resolution to the Bhutanese refugee crisis are at a standstill – despite the fact that the refugees are eager to return home. The lack of durable solutions to the crisis, however, makes it all the more imperative that UNHCR, BRWF and their partners continue to push for the development and promotion of sustainable income generation activities for refugee women and girls. Without safe opportunities to earn income, women and girls will remain both dependent and vulnerable.

KEY FINDINGS

- Nepal presents a clear example of the need to think ahead in terms of sustainability when beginning a fuel program. Whereas kerosene was "cheap, available and easy to obtain"[50] when the distribution began in 1992, the price has more than doubled in the last two years alone. In addition, strikes and blockades imposed as a result of the Maoist insurgency have caused frequent scarcities of the fuel. While political events are often difficult to predict, it was less difficult to predict that the prices of petroleum-based fuels would increase over the long term.
- There is currently an enormous amount of effort by UNHCR and local and international NGOs to develop alternative fuels for use in the camps in Nepal, and therefore an abundance of initiatives are in various stages of development (see below). Because of refugees' reliance on kerosene as a key source of income, however, they are much less willing to use such fuels. This may change once UNHCR officially ceases kerosene distribution in early 2006.
- The most important aspects of cooking fuel for Bhutanese refugee women (apart from its ability to cook food) appears to be the speed of cooking, ease of use and ability to cook indoors. Other important qualities are low smoke emissions and flexibility of cooking time and temperature.

- The demonstrations and small-scale trainings associated with the introduction of the honeycomb briquettes caused significant confusion among refugees regarding who would be responsible for collection of raw materials and for producing the briquettes. Poorly planned trainings may have contributed to the reluctance of refugees to accept the briquettes.
- The involvement of the local community in briquette manufacture is key to the success of the program, both in terms of permitting the use of forest products and providing local communities with a tangible benefit to encourage their continued acceptance of the camps.
- Even when kerosene is plentiful, the vast majority of Bhutanese refugees use firewood as their main cooking fuel. Refugees inside the camps often pool and sell or exchange part or all of their kerosene rations for cash or for supplements to their rations. If refugees have other means of earning income, they may be more willing to accept other fuels – or at the very least to try them.
- Under Nepali law, income generation activities are prohibited – even within the camps. Without the ability to legally earn income, refugee women and girls are more likely to put themselves at risk either by selling their kerosene and collecting firewood as a fuel replacement and/or by subjecting themselves to exploitation and abuse, including sexual violence, by working illegally.
- In recent years, established income generation activities within camps have been stopped by the district governments after complaints from the local vendors from whom the agencies previously bought such goods.
- Refugee women in Nepal seemed reluctant to express positive sentiments about any type of fuel except kerosene. This attitude can be attributed to the fact that the women were aware and upset that UNHCR is intending to scale back kerosene distribution, and feared that discussing the good qualities of alternative fuels would be seen by UNHCR as supportive of the change. Such attitudes, however, have likely skewed some of the women's actual opinions of the alternative fuels and/or devices, and their responses must be understood with this possibility in mind.

OVERVIEW OF SPECIFIC FUEL-RELATED FINDINGS

Kerosene: kerosene has been distributed to all Bhutanese refugee families since 1992-93. It is undoubtedly the fuel preferred by refugees. Not only is it easy and fast to cook with, but it provides them with a major source of income. However, it is very expensive (and continually increasing in cost), must be imported and is therefore subject to transportation and other potential delays. It also produces a fair amount of indoor pollution, though not nearly as much as firewood.

Bio-mass briquettes ("honeycomb" or "beehive"): these large, single-use briquettes are made from a combination of charred forest waste, filler and a binder such as clay or molasses. UNHCR hopes that after an initial training period and investment in capacity-building, honeycomb briquettes will become the main source of cooking fuel in at least four of the seven camps. So far refugees have been extremely reluctant to use the briquettes, in part because of the labor intensiveness of the manufacturing process but also because refugees consider the briquettes inferior to kerosene. Key advantages include smokeless burning, the fact that the briquettes can be produced locally (using all local materials) and their relatively low cost. Disadvantages include the labor-intensive production process, large amount of raw materials needed to make relatively few briquettes, ongoing tension between refugees and host communities regarding use of forest products and lack of flexibility of cooking time or temperature.

Bio-mass briquettes (other): various organizations and local universities are experimenting with different combinations of raw materials in the briquette-making process, including using rice husk and other agricultural wastes rather than strictly forest waste. Advantages and disadvantages are similar to the honeycomb briquettes described above, although they vary in shape, size and burn time.

Charcoal: charcoal briquettes will replace kerosene as the main fuel source in four of the camps beginning in early 2006, as local communities and/or refugees are trained to make honeycomb briquettes. Refugees appear to be much more accepting of the charcoal than of the honeycomb briquettes, at least in part because charcoal

will be distributed – there has been no suggestion that the refugees themselves will be responsible for charcoal production. Unlike the honeycomb briquettes, charcoal provides flexibility of cooking time and temperature, and can be re-used if not fully burnt. They cook relatively quickly but produce more smoke than either kerosene or the honeycomb briquettes. Further, the manufacturing process itself requires significant energy compared to the amount of energy that the briquettes then produce for cooking. At least initially, charcoal will have to be imported from India, which will increase the cost and potentially be subject to the same transportation delays as kerosene.

Solar cookers: the joint Dutch-Nepali Vajra Foundation has supported an extensive parabolic solar cooker program in one of the camps (Beldangi I) for several years. The refugees use the cookers and are generally pleased with them. Because the cookers have so far been merely a supplement to kerosene, however, it remains to be seen how successful the program would be in absence of non-solar alternatives. Solar is also problematic in Nepal as there is only enough sun on 40-60 percent of days during the year to effectively use the cookers – therefore necessitating an additional fuel source and increasing overall cost. Per-unit cost for the parabolic cookers is also quite high, though it declines over time as they require little upkeep and last for many years. The parabolic cookers cook food relatively quickly but require more space than is available in many of the camps.

Biogas: biogas is an organic fuel created by the fermentation of human waste collected in sealed underground tanks called biodigesters. Biodigesters have been installed in refugee-affected host communities by various local organizations (at least one with support from UNHCR), but attempts to install smaller versions in the camps themselves have run into government resistance because the digesters are considered permanent structures. Some beneficiaries have also been reluctant to use a fuel they consider "unclean."

APPENDICES

METHODOLOGY

The aim of the Women's Commission's project on refugee women and fuel needs was to investigate methods for reducing the vulnerability of displaced women and girls to GBV during the collection of firewood. The project set out to assess alternative fuel options, firewood collection techniques and other protection strategies appropriate to the local context and in all phases of an emergency.

As a part of accomplishing these goals, the Women's Commission researcher conducted site visits in the Bhutanese refugee camps in the Jhapa and Morang Districts of eastern Nepal, in order to get a first hand view of how UN agencies and NGOs approach cooking fuel needs in camp situations. Nepal was chosen as a site visit location because it provided a chance to carefully study and weigh a variety of different fuel options.

In Nepal, the Women's Commission organized a series of focus group discussions through the Bhutanese Refugee Women Forum (BRWF) in three of the four camps visited (Sanischare, Kudunabari and Beldangi II) in November 2005. The first group consisted mostly of BRWF leaders (6-8 in total); the second was 13-15 strictly BRWF project participants and trainees (that is, not leadership level); and the third was six secondary school teachers and counselors.

The first two groups were asked their opinions about kerosene, kerosene stoves, whether or not they had tried or heard of alternative fuels such as bio-briquettes or solar cookers and their opinions thereon, as well as the most important qualities of any potential cooking fuel and their opinions on communal cooking. They were asked about the sale of kerosene or use of kerosene for purposes other than cooking and whether or not they had access to other means of earning income. Lastly, they were asked about their feelings of security outside the camps. The secondary school teachers and counselors were primarily asked questions related to opportunities available to refugee girls after finishing their education.

In addition to group discussions with displaced women, the Women's Commission conducted a series of one-on-one interviews with refugee women, as well as with UN and NGO staff at field, country and headquarters level. The interviews were conducted in a free-flowing manner, aimed at encouraging as much discussion as possible on a wide range of topics.

Displaced women were asked their opinions on fuel-related trainings they had participated in, such as bio-briquette making. Women using solar cookers in Beldangi I camp were asked about their opinions of the cookers, including how often they use the cookers, the speed of cooking, taste of the food and scheduling use of the cookers with their neighbors. The Women's Commission researcher was also given a one-on-one demonstration of bio-briquette trainings in Nepal (the actual trainings had been conducted before the visit).

UN and NGO staff were asked questions specific to their agencies, including fuel-efficient rations and cooking techniques in the case of the World Food Program and the Food and Agriculture Organization, as well as how both agencies view their respective protection roles. NGOs such as LWF and CRT were asked questions related to their specific activities in the field or to their development and testing of fuels and fuel technologies. All humanitarian actors were asked their opinions on coordination of fuel-related initiatives.

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Mina Parajuli Panthi, Community Service Officer and Chanakya Adhikari, Program Officer – Bhutanese Refugee Project, Lutheran World Federation (LWF). Damak. November 14, 2005.

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Geert Brugman, Field Volunteer, Vajra Foundation-Nepal. Beldangi I Refugee Camp, Jhapa District. November 16, 2005.

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Manoj Rai, Administrator, Kudunabari Refugee Camp. Jhapa District. November 17, 2005.

BRWF, focus group of 13 members. Beldangi II Refugee Camp, Jhapa District. November 18, 2005.

Ganesh Ram Shrestha, Executive Director, and program, training and management staff, Center for Rural Technology (CRT). Kathmandu. November 21, 2005.

TIMELINE OF SITE VISITS (ALL 2005)

10 - 13 November: Kathmandu

13 - 19 November: Jhapa and Morang Districts
- Sanischare camp
- Beldangi I camp
- Kudunabari camp
- Beldangi II camp

19 - 22 November: Kathmandu

END NOTES

[1] The Nepali Red Cross (NRC) was UNHCR's implementing partner for fuel distribution through 2005 but has since been replaced by LWF in a consolidation move by UNHCR.

[2] Refugees are still not legally allowed to leave the camps without official permits, though in practice many do, mostly to work illegally.

[3] UNHCR-Nepal country office staff, interview, and UNHCR sub-office field protection staff, interview with author, Damak, November 14, 2005.

[4] Aryal, email to author, January 29, 2006.

[5] LWF briefly supported a stove repair training program, but it was not successful because the stove repairers charged for their services and most repairs only lasted a few days.

[6] Both Temai and Goldap camp are located in larger forests with smaller local communities, resulting in less pressure on the surrounding environment. According to UNHCR, some refugees from other camps travel to Goldap or Temai on weekends in order to collect wood [UNHCR field protection staff, interview].

[7] DB Bhattarai (CARITAS teacher/counselor), interview with author, Sansichare camp (Morang), November 15, 2005.

[8] UNHCR-Nepal country office staff, interview.

[9] Bhattarai, interview.

[10] Trafficking is not limited to refugee girls; the trafficking of Nepali girls to India is widespread, with estimates of between 5,000-7,000 Nepali girls and women trafficked to India every year.

[11] Group discussion with six BRWF members and author, Kudunabari camp (Jhapa), November 17, 2005.

[12] Group discussion with five secondary school teachers/counselors and author, Kundunabari camp (Jhapa), November 17, 2005.

[13] Group discussion with 13 refugee women and author, Beldangi II camp (Jhapa), November 18, 2005.

[14] UNHCR-Nepal country office staff, interview.

[15] Ibid.

[16] Directly contradicting a key recommendation of UNHCR's own *Cooking Options in Refugee Situations*: *A Handbook of Experiences in Energy Conservation and Alternative Fuels* (2002), which states clearly that the selected cooking fuel should be "unattractive for resale" (p. 39).

[17] The sale of kerosene by refugees has become well organized over time: often, groups of refugees will pool their rations for mass sale by a fellow refugee or small group of refugees who have identified and developed markets, with total profits divided among contributors.

[18] UNHCR-Nepal sub-office, "Rapid Appraisal of Domestic Energy Needs of Bhutanese Refugees, Damak, August 2005." Internal document obtained from UNHCR by author.

[19] UNHCR-Nepal country office staff, interview.

[20] Solar cookers have been tested in Beldangi camp since 1998.

[21] UNHCR-Nepal country office staff, interview.

[22] The CFUGs have been reluctant to allow collection of any other forest product for use in briquette production, and do not allow *any* collection, even of banmara, during the rainy season (1-2 months per year) for ecological reasons.

[23] The ratios of char to binder can be varied, but tests by both LWF and CRT have suggested 80/20 gives the longest burn time.

[24] The Kathmandu-based Biogas Support Group estimates a cost of NPR 35,000 (U.S.$470) for a small plant of seven cubic meters, though the overall cost declines over time since most of the costs are sunk rather than ongoing [Anup Aryal, Program Assistant, UNHCR sub-office, interview with author, Damak, November 14, 2005]. The author's attempts to reach the Biogas Support Group directly were unsuccessful.

[25] Currently each SK-14 comes with 2 pots, though only one can be used at a time. The Vajra Foundation is experimenting with different ways of cooking with more than one pot at a time.

[26] Geert Brugman (Vajra Foundation field volunteer), interview with author, Beldangi I camp (Jhapa), November 16, 2005.

[27] Though not necessarily any less labor-intensive than the constant stirring required when using kerosene or firewood as a cooking fuel.

[28] According to the Vajra Foundation, having users pay a token sum for the cookers is important in that it instills a sense of ownership in the device, making the users more likely to use, maintain and repair them. [Brugman, interview].

[29] Brugman, interview. However, UNHCR has estimated the per-unit cost to be somewhat higher: NPR 11,500 (U.S.$153) [Aryal, interview].

[30] Brugman, interview.

[31] The Vajra Foundation estimates that it could cover approximately 80 percent of all refugee families at a ratio of one cooker per two families.

[32] Brugman, interview.

[33] Ibid.

[34] René Goverde and Ralph Lindeboom, "Solar Cooking: Moving One Step Ahead" (preliminary report prepared for the Vajra Foundation and University of Utrecht, December 2004, pp. 4, 8).

[35] Brugman, interview.

[36] Sita Rai (refugee bio-briquette trainee), interview with author, Beldangi I camp (Jhapa), November 16, 2005.

[37] CRT staff, interview with author, Kathmandu, November 21, 2005.

[38] As noted by CRT staff, rural women and girls are also vulnerable during firewood collection, though not always in the same way as refugee women and girls. The most common risks associated with firewood collection in rural, non-refugee settings include natural disasters such as floods and landslides and attack by wild animals [CRT staff, interview].

[39] Badri Maharjan, "A Report on Alternative Cooking Fuel for Bhutanese Refugees" (report prepared for UNHCR and LWF-Damak Bhutanese Refugee Project, November 17, 2005).

[40] LWF estimates the cost of each briquette at between NPR 5 and NPR 7.5 (U.S.$0.06-0.10) depending on size; UNHCR places per-briquette cost at NPR 8 (U.S.$0.11), approximately 37 percent less than the cost of an equivalent amount of kerosene. [Badri Maharjan (Deputy Eastern Region Coordinator – LWF Bhutanese Refugee Project), interview with author, Damak, November 14, 2005 and Aryal, interview].

[41] According to LWF and CARITAS staff in Sanischare camp, despite the fact that UNHCR and LWF obtained permission from the CFUG before collecting banmara during the initial briquette-making demonstrations, the local community was suspicious that refugees were collecting wood in addition to banmara. At the time of the Women's Commission's visit, 2-3 months after the initial demonstrations, the tensions had still not been resolved and there had been no additional collections or briquette-making demonstrations. [Prabhan Ram Cherwan (LWF Incentive Post In-Charge), interview with author, Sanischare camp (Morang), November 15, 2005 and Bhattarai, interview].

[42] Chari Maya Thatal (refugee bio-briquette trainee), interview with author, Sanischare camp (Morang), November 15, 2005 and Rai, interview].

[43] The typical meal for a Bhutanese refugee family consists of *daal bhaat* (lentils and rice) and curried vegetables when available. With only one pot and/or one small stove, the dishes must be cooked consecutively and the overall cooking process is therefore fairly lengthy.

[44] LWF has been developing a smaller briquette, but it was not yet widely used at the time of the Women's Commission visit to Nepal. As the current manufacturing and cooking processes are organized, the smaller briquette would require both separate presses and stoves.

[45] LWF estimates that 25 percent of total need can be met by banmara alone; 25 percent more can be met if banmara is combined with other biomass such as sawdust or rice husk. Maharjan, interview.

[46] The compressed coal dust briquettes being used in the three Beldangi camps would in theory also be subject to these concerns as they will also be imported from India.

[47] Maharjan, interview.

[48] BRWF Secretariat staff, interview with author, Sanischare camp (Morang), November 15, 2005.

[49] Talks between the Nepali and Bhutanese governments regarding eventual repatriation have stalled, and Nepal so far has not allowed any resettlement of Bhutanese refugees, partly out of fear that doing so would encourage local integration.

[50] UNHCR Nepal country office staff, interview by author, Kathmandu, November 11, 2005.

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