

NORWEGIAN REFUGEE COUNCIL

# EVALUATION REPORT

▶ ▶ **THE ECOLOGICAL IMPACT OF  
REFUGEE/RETURNEE  
PROGRAMMES SUPPORTED BY THE  
NORWEGIAN REFUGEE COUNCIL IN  
BURUNDI**

A REVIEW OF ACTIONS TAKEN TO MITIGATE SUCH IMPACTS

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STUDY CONDUCTED BY PROACT NETWORK

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FEBRUARY 2009

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## **ACRONYMS AND ABBREVIATIONS**

CEAP	Community environmental action plan
DRC	Democratic Republic of Congo
ha	hectare
IDP	Internally displaced person
IEC	Information, education, communication
m	metre
km <sup>2</sup>	square kilometre
NRC	Norwegian Refugee Council
REA	Rapid environmental assessment
UNHCR	United Nations High Commissioner for Refugees

## EXECUTIVE SUMMARY

At the request of the Norwegian Refugee Council, this review was undertaken of the ecological impact of the organisation in Burundi, including its Camp Management and Shelter programmes.

Following initial briefings from NRC, and additional background research and the drafting of a series of checklists and other tools, a field mission was undertaken from 27 October to 8 November 2008. The Mission consisted of a series of meetings in Bujumbura, the country's capital city, as well as on-site visits to three refugee camps and one resettlement site.

As a backdrop to this review, NRC Burundi – in its 2008-2009 Plan of Action – set certain objectives in terms of improved environmental protection in the implementation of its activities. Three specific objectives were noted:

- to find alternative solutions to the use of firewood in order to reduce its use by 75 per cent in refugee camps;
- to analyse the technical approach adopted by NRC in the construction of houses, household latrines and social infrastructure (classrooms, latrines blocs...), and propose improvements or possible alternatives for the use of materials with limited adverse environmental impact; and
- to mitigate waste and environmental pollution as a result of offices in Burundi.

The Mission commends NRC on the approach it has taken through this Plan of Action and particularly the high standards it has set – and maintains – in addressing these objectives. NRC, for example, has been highly conscious of the possible environmental impacts associated with the activities of its four offices in Burundi. Some minor areas for improvement do remain, e.g. in relation to the stocking and safe disposal of potentially hazardous chemicals and cross-referring the supplier's database with environmental information and considerations, but in general this activity was being conducted at a very high level. Some issue, such as the eventual disposal of waste at the Bujumbura tip level are outside of the control of this programme.

**ProAct recommends that NRC continues to exercise the activities it is currently supporting, and re-enforces this by appointing a country Environmental Focal Point, or a Burundi “Green Team”, with volunteer staff from each of its offices.**

Similar high standards were recorded in terms of the construction of shelters and schools. Local contractors and suppliers are carefully screened to ensure that the materials they use or supply, e.g. construction wood, are credibly sourced. Attention does, however, need to be given to backfilling pits dug for clay bricks, since these can quickly become a hazard to children and animals in particular. The can also serve as a reservoir for disease carrying vectors such as mosquitoes.

More attention needs also to be given to the distribution of saplings to beneficiaries once they have helped construct their houses. Consideration needs to be given to the space available for planting trees around their houses, as well as the selection of species provided. It is recommended that prior consultation be done with intended beneficiaries on the choice of tree species. Growing the appropriate seedlings could then become a small-scale income generating activity for selected refugees or host families in the respective areas.

**Overall, NRC shelter projects have taken environmental factors into consideration in the design of all shelter projects to a high level. ProAct recommends that the Burundi example is highlighted for other NRC projects.**

In relation to the third component of this review, several opportunities were identified where progress could be made. One of the underlying problems regarding the provision of firewood to camps – as is the current practice – is that there are no baseline data on a) the amount of firewood needed at a household level and b) the amount of wood actually consumed. What is apparent by the scale and extent of charcoal making in at least two of the camps is that too much wood is being delivered to the camps.

In addition, the wood supplied is neither stored nor dried, which is extremely energy inefficient. Households have no incentive to themselves split or dry wood as it is currently so freely available.

Manufactured briquettes have been introduced – together with a fuel-efficient stove – to Gihinga camp, but people do not care to use the briquettes, though they are known to burn them on some occasions. The actual fuel-efficiency rate of the current stove needs to be checked by an independent evaluation.

Firewood appears to remain the firm favourite source of cooking energy and heat for households, based on feedback during this Mission – as indeed it is in much of Africa. Several alternative solutions to firewood have been considered in this report, but no one stands out at this point in time as being either economically, culturally or practically feasible in the current Burundian context. However, there are several measures that NRC can take to reduce firewood consumption in camps, which are detailed in this report.

Significant reductions can almost certainly already be made in the camp context, with relatively little effort or cost. A series of baseline assessments urgently need to be carried out as a first step, otherwise any further intervention will have no reference point as to its effectiveness. This may require some external guidance and training of local staff and selected representatives from the communities to undertake the initial work and subsequent periodic assessments.

At the same time, however, the Mission strongly recommends that discussions are held between NRC, UNHCR, government counterparts and local community leaders to develop sound management and harvesting plans for plantations in the vicinity of camps. This would have environmental, economic and social benefits for local host communities.

**Reducing the current levels of firewood to camps is a challenge and should not be approached lightly. Finding a solution that accommodates all stakeholders will take some additional time but, in the meantime, some practical actions are highlighted that would already serve as an important step towards the overall goal. These include:**

- The use of fuel-efficient stoves, combined with the adoption of good cooking practices can result in between a 25-30 per cent reduction in firewood consumption. This is currently not happening.
- Regular and consistent use of kitchens and cooking shelters – which can also be used to dry wood – should result in firewood saving of between 5-10 per cent.
- The use of dry wood will result in lower rates of firewood consumption (between 10-15 per cent). This is extremely limited and related to lack of awareness, combined with ready access to firewood.

**The combination of several approaches as outlined in the report below, together with a responsible reduction of the amount of firewood provided should bring about a significant and lasting stable reduction in energy demands. Key to achieving this, however, rests on another combination of activities, namely assessments, capacity building, awareness raising and monitoring.**

# **1. INTRODUCTION**

## **1.1 COUNTRY CONTEXT**

Burundi is located along the north-eastern shores of Lake Tanganyika, in Central Africa, bordering the Democratic Republic of Congo (DRC), Rwanda and Tanzania. It is a relatively small (27,830km<sup>2</sup>) and mountainous country, with an estimated population of between 8.5 and 9 million people.

Since 1993, conflicts in Burundi, Rwanda and the DRC have resulted in more than five million deaths and have generated hundreds of thousands of refugees and internally displaced persons (IDPs). The situation in Burundi today reflects the impacts of these conflicts, with approximately 350,000 Burundian refugees now living in Tanzania and 117,000 people being internally displaced within the country. In addition, there are currently three refugee camps in Burundi, at Gihinga, Gasorwe and Musasa, housing – as of November 2008 – 16,382 Congolese refugees.

Some 800,000 Burundians fled to Tanzania over the past three decades. The suspension of fighting in most of the country from 2004, however, has led to the return of large numbers of people. Many more are expected to return in 2009 and some transitional camps for returnees have already been established.

Of the Burundian refugees still living in Tanzania, some 110,000 remain in camps. The Tanzanian authorities have, however, confirmed their intention to close the refugee camps in 2009, which may cause a sudden rise in the number of possible returnees. Over 45,000 refugees from the 1972 caseload residing outside of camps have also expressed their intention to return.

Today, the main challenge of Burundi is to consolidate peace, but this is in a context of extreme structural poverty, of general impunity and of a fragile post-conflict situation. General elections are planned in Burundi in 2010.

## **1.2 ENVIRONMENTAL SITUATION**

Burundi is faced with a suite of environmental issues many of which are aggravated by the high population density and scarcity of land. The waves of human displacement that parts of the country at least have experienced since the early 1990s have added to this pressure, particularly in terms of forestry resources. These issues are mainly related to limited human resources and a low awareness of environment-related issues, but are also exacerbated by the various crises the country had faced.

Possibly the most significant environmental issue of concern to the country is the high level of deforestation for energy, construction and land clearance for agriculture. More than 90 per cent of the population depend on wood as their primary source of energy, for cooking and heating. In some parts of the country, uncontrolled wood harvesting for shelter construction and as a source of domestic energy have led to localised deforestation. This, in turn, is having noticeable impacts on local climates, resulting in denuded lands, the destruction of water catchments, unpredictable rains, a loss of soil fertility, crop failure – which is also attributed to poor agricultural practices – and the loss of marshland habitats, an important source of agricultural

land. Deforestation activities are now strongly linked to food security issues in the country.

Burundi, like the rest of Sub-Saharan Africa, is particularly vulnerable to the impacts of climate change. The changing patterns of rainfall and temperature, and increased frequency and scale of weather-related extreme events such as droughts and floods affect especially agriculture, water resources, natural ecosystems and health, all of which are likely to be the most vulnerable sectors to climate change in Burundi. Adaptation to climate change is imperative and will need to be integrated both into national planning, disaster management strategies and development programmes.

Given the anticipated rate of return from Tanzania – combined with the current refugee caseload – it is likely that the pressure on critical ecosystems such as wetlands and specific natural resources such as trees for fuel and construction purposes will only increase. The need to curb unauthorised deforestation, improve agricultural practices and re-plant areas with indigenous tree species are major challenges facing the government, to which disaster risk reduction and taking measures to adapt to local and regional changes in the climate should now also be added.

### **1.3 NRC BURUNDI ACTIVITIES**

The overall objective of NRC in Burundi is to promote and protect the basic rights of returnees, IDPs and refugees, and to facilitate voluntary return or re-integration as a durable solution. The programme focuses on the most recent and the most vulnerable returnees and IDPs. Activities examined in this review included:

- **Shelter:** NRC's Burundi shelter programme has constructed over 200 permanent and 600 semi-permanent classrooms, and more than 13,000 shelters for returnees and the host population.
- **Camp management:** NRC currently manages Gihinga, Gasorwe and Musasa camps, with a caseload of 16,382 Congolese refugees. Musasa camp, which used to be a transit centre, was constructed in 2008. NRC distributes food and non-food items – including firewood – in the camps.

The NRC will continue its current work in order to facilitate the re-insertion of returnees, with an integrated and protection-oriented approach that includes a major advocacy role. Geographical priorities correspond to areas where rates of return are highest and where the population has been most affected by conflict and displacement, in co-ordination with other intervening organisations. Factors influencing the volume of activities are the number of returnees and IDPs, the return of Congolese refugees to DRC and the influx of new refugees to Burundi.

Environment-related issues are central to much of the camp management and shelter components mentioned above, as indeed they are to the entire humanitarian programme in Burundi. Some significant challenges are identified in this report which, if addressed, should result in a general improvement of the current situation, sizeable cost savings and improved conditions for the refugee community at least. Additional broader initiatives might also be started, for example re-afforestation or

assisted agricultural programmes, some of which would have positive benefits for helping address issues such as risk reduction and prevention. This does not require a completely new programme of intervention by the NRC or its partners, merely some adjustments, refinements and the introduction of certain additional programme support components, such as baseline assessments, better awareness raising and improved monitoring.

#### **1.4 NRC POLICIES**

NRC has established a number of policies that directly relate to this review, in particular in relation to climate change and human displacement, camp management and shelter. Extracts from these policies are included below as parts of this are pertinent to the current review.

##### **Climate Change, Environment and Displacement Position Paper**

*This paper states that “In line with its aim to ensure adequate protection and provide durable solutions, NRC seeks to integrate climate change and environmental considerations and measures in all NRC core activities, i.e. Shelter, Camp Management, Emergency Food Security and Distribution, Education and ICLA (Information, Counselling and Legal Assistance). It is necessary to address both impacts of displacement and operations on the environment and environmental impacts on the displaced and operations.*

*Climate change mitigation is about protecting the environment and climate. Mitigation measures include greenhouse gas emission cuts, but also sequestering carbon through reforestation... Humanitarian operations are, however, also confronted with the climate change impacts of today and the near future. Climate change adaptation is about protecting from the environment and climate. People can be protected by finding and implementing ways of adjusting to the change. The impact of climate change depends on both exposure and vulnerability to natural hazards. Therefore, a broad approach to adaptation, including resilience building, can reduce the impact and risk of displacement. NRC believes adaptation, disaster risk reduction and humanitarian response are and must be closely linked elements. Humanitarian response is a form of adaptation, but the response itself also needs to be adapted. Adapting to climate change for humanitarian actors will require inter alia more effective vulnerability analysis, mapping, contingency planning, and other preparedness measures.*

*Some adaptation measures also have mitigation effects. In food security and camp management projects, NRC has developed a fuel-efficient stove which lessens the need for firewood... NRC climate change and environmental considerations and measures vary with the different core activities and range from site planning, building codes and transport to environmental education, agro-forestry and counselling on land and return.*

*Durable solutions must also be considered with a climate change and environmental perspective. Due to climate change and environmental degradation, some areas of origin may be or become uninhabitable and return may be inadvisable. Environmental considerations and measures are also crucial in local integration and*

*resettlement to reduce negative impacts on the environment and tensions with the local inhabitants.”*

### **Camp Management Policy**

NRC’s camp management policy states that *“All camp management activities will be in the sole interest of the displaced population and will strive to meet international standards and instruments. NRC camp management activities will in general:*

- *Use a holistic approach, recognising the value of camp management as an independent intervention.*
- *Foster partnerships with and empower camp residents to harness their vested interest in camp maintenance and as a method for stabilisation.*
- *Promote cooperation, integration and a sustainable relationship between camp residents and host populations. A host community liaison officer may be appointed.*
- *Establish solid coordination mechanisms and training with all stakeholders and partners (e.g. UNHCR, International Organization for Migration (IOM), NGOs and local authorities).*
- *Apply the ‘Do No Harm’ approach.*
- *Apply the bottom-up approach by nurturing partnership and consultation with all stakeholders, except where this is difficult in an emergency.*
- *Always develop and focus on an exit strategy, and advocate for safe, dignified and voluntary return, local integration or resettlement.”*

### **Shelter Policy**

This policy states that *“NRC will provide shelter that is of an appropriate standard, and is culturally and environmentally sensitive. More specifically, NRC will:*

- *Provide solutions adapted to the specific context in both short and longer term emergency situations.*
- *In emergency interventions, strive to meet the Sphere Project ‘Minimum Standards in Humanitarian Response’ and the UNHCR Handbook for Emergencies – as regards shelter solutions.*
- *Support permanent housing in return or resettlement situations. Shelter for durable settlement will be moderate within the local context and cover the basic functions and standards needed to provide healthy, secure and dignified dwellings.*
- *Ensure that the shelter components integrate into a sustainable living situation including basic infrastructure, especially through cooperation with other partners and service providers.*
- *Ensure that shelter solutions consider and reflect the wider aspects of settlement conditions such as cultural and social aspects, climatic and environmental risks and security factors.*
- *Integrate environmentally friendly materials and appropriate technology in solutions.”*

## **1.5 REVIEW BACKGROUND**

In accordance with the above policy papers, NRC Burundi initiated an environmental review of its shelter, camp management and office administration projects. A Steering Committee was created, consisting of the Shelter Adviser, the Camp Management Adviser, the Senior Adviser for Strategic Management Support, the Legal Co-ordinator on Climate Change and the Programme Co-ordinator Burundi, all from NRC's head office, as well as the Country Director and the Shelter and the Camp Management Programme Manager from the NRC country programme in Burundi.

The review, undertaken by ProAct Network, had three specific objectives, which were to:

1. find alternative solutions to firewood in order to reduce its use by 75 per cent in the three Congolese refugee camps managed by NRC;
2. analyse the technical approach adopted by NRC in the construction of houses, household latrines and social infrastructures, and propose improvements or possible alternatives for the use of materials with limited adverse environmental impact; and
3. fight against waste and environmental pollution in NRC offices in Burundi.

## **1.6 METHODOLOGY**

Following a series of initial briefings with Technical Advisors from NRC's headquarters in Oslo, desktop and background research was carried out ahead of a two-week field mission to Burundi that was conducted from 27 October to 8 November 2008. This Mission combined field visits with interviews, meetings and focus group discussion.

The broad methodology applied for meetings and consultations involved groups of no more than ten persons, with each group being briefed initially on the purpose of the Mission. In order to focus discussions on the priority topics, no more than five questions/themes were raised in each session. The participants were encouraged to elaborate on any of the issues raised, and the consultants (through a translator) transcribed these comments/discussions.

Due to time constraints – the Mission was unable to spend more than three hours at any one camp – it was not possible to embark upon empirical studies or enter into minute detail on many issues. The type of data collected came either from group discussions, direct observation and questions asked by the consultants to both beneficiaries and NRC staff. As such, the data was qualitative in nature, as this was considered to be the only appropriate way of forming an impression of the situation in the field, given so little time.

This report compiles the main findings and recommendations of the review and provides additional tools for further use by NRC in Burundi and other countries. It is separated into three sections corresponding to the three specific objectives outlined in the Terms of Reference to this review.

## 2. FIREWOOD AND POSSIBLE ALTERNATIVE SOLUTIONS

### 2.1 BURUNDIAN CONTEXT

Most, if not all, refugee and IDP operations have a common – and often quite significant – dependency on having to provide or access natural resources as form of domestic energy. Burundi is no exception, though in this case the issue has become quite serious and efforts are being made to reduce the current volumes of wood being collected and provided to the camps.

Climate change will have a further impact on forest resources due to potential changes in rainfall, temperature and diseases. Plantations and reforestation initiatives will in future need to adapt to these changing conditions. In addition, 20 per cent of global greenhouse gas emissions originate from deforestation and forest degradation, which is particularly relevant in the African context.

To this end, a target has been set to try and find alternative solutions to firewood in order to reduce its use by 75 per cent in the three Congolese refugee camps managed by NRC.

Burundi does not possess extensive forest cover, either natural or under plantations (see Table 1). In addition, according to available data, 95 per cent of wood consumed in Burundi is for household energy, with the remainder being used for construction. This figure is again not unique to Burundi, but is on a par with most other sub-Saharan countries.

Table 1. An estimate of land use in Burundi is summarised in the following table (source: UNDP/FAO)

Land use	Area (ha)	%
Natural forests	50,000	2
Plantations	124,000	5
Savannah, pastures,	940,000	33
Non-commercial crops	1,210,000	43
Commercial crops	104,000	4
Marshland	112,000	5
Lakes	218,000	8
Towns	25,000	1
<b>Total</b>	<b>2,783,400</b>	<b>100</b>

Two main documents frame Burundian environmental legislation:

- Le Code de l'Environnement (2000); and
- Le Code Forestier (1976).

Both documents highlight the main environmental issues mentioned above and set out a legal framework for management and use. They are, however, largely ignored and remain unenforced due to a lack of human and financial resources. The whole dimension of forestry management therefore remains an area of concern.

It is against this background that the Government of Burundi has expressed to NRC a wish that firewood supplies to the camps it is currently managing should be reduced by 75 per cent by the beginning of 2009.

## **2.2 CAMPS AND NUMBERS**

Gihinga camp, in Mwaro Province, has the lowest camp population of the camps managed by NRC (2,826 people). The camp population is culturally homogenous – few internal camp conflicts have been recorded – and is therefore relatively easy to manage. The camp is well planned, and plots for family shelters are relatively large.

Gasorwe, in Muyinga Province, has the highest camp population, with 7,713 people registered. Shelters are organised in groups of 12, around a communal cooking area. This design is not followed in the other camps.

Musasa, in Ngozi Province, was formally a transit camp, but now has a population of 5,843 people. NRC is currently re-designing the camp as a formal refugee camp. Some shelters have been constructed at the site, while many families remain in communal shelter areas, awaiting the building of shelters. The camp population is not culturally homogenous, and NRC field staff report that the level of co-operation between the different groups is limited, and tensions often build. Since the camp is currently being re-designed, the Mission found it difficult to make concrete observations during its visit to this site.

One issue which is important to note is that either private plantations or state forests flank all of the camps, to varying extents. Having such resources along the boundaries of the camp could – unless appropriate actions are taken now – lead to illegal cutting, and result in tensions with local communities. Consideration should be given to an awareness campaign, for example, as well as clear boundary demarcation.

## **2.3 METHODOLOGY**

Three main techniques were used in the collection of data. These were:

**Meetings** – These focused on the collection of background and current status information on forestry, firewood supply, its use and possible alternative fuel sources to firewood. Meetings were held with the following:

- Officials from the Ministry of Environment.
- The Director of Forestry sector.
- Provincial Governors.
- Provincial Forestry Inspector.

- Environmental NGOs.
- Alternative fuels manufacturers.
- NRC staff.
- UNHCR staff.
- Camp leaders.
- Charcoal sellers.
- Wood suppliers.
- Chefs des collines.

**Focus group discussions** – At each camp, the Mission held a focus group discussion exercise with female camp residents.

#### Photo of fgd meeting in Gasorwe

The objective of these discussions was to explore the following issues:

- supplementary acquisition of firewood;
- types of fuels commonly used in the camp;
- types of stoves favoured by beneficiaries;
- level of knowledge relating to fuel-efficient cooking practices;
- suggested solutions.

**Direct observation** – The Mission toured each camp briefly, the objective being to verify the feedback from the focus group discussions.

## 2.4 MAIN FINDINGS

### 2.4.1 Forestry Resources and Management

NRC does not have records of any environmental baseline data dating back to the time when the camps were established. (It is acknowledged, however, that NRC was not responsible for the establishment of the majority of the camps.) This lack of baseline data nonetheless makes assessing the impact of the refugee camps on local forestry resources – and the broader environment – problematic. One practical way to address this would be to conduct rapid environmental assessments on the camps and surrounding areas (see for example UNHCR / CARE International Rapid Environmental Assessment<sup>1</sup> Handbook). Such assessments do not replace a formal environmental impact assessment – which is a legal requirement for camps in certain countries – but they have proven of value in many settings.

For example, the lack of relevant baseline data relating to existing forestry resources hampers NRC's ability to assess the impact of (or defend accusations relating to) the refugee operations in relation to forestry and natural resources.

Given the high levels of wood being provided to camps, a lack of involvement in simultaneous re-forestation initiatives could be perceived by the government to mean that NRC is not committed to environmental rehabilitation/conservation. The use of land for the establishment of exotic tree plantations is rife in Burundi – NRC,

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<sup>1</sup> The Framework for Assessing, Monitoring and Evaluating the Environment in Refugee-related Operations is available

by procuring firewood from these sources is implicitly involved – often at the expense of indigenous, natural forest areas. This lack of involvement could reflect negatively on NRC and, by association, UNHCR.

NRC now has an ideal opportunity to undertake a rapid environmental assessment of the new, planned camp at Bwagiriza. This process – which is based on a consultative and participatory approach involving the host and displaced communities, Camp Management Agency and local authorities – can provide considerable information and guidance in relation to environmental issues and concerns. It is essentially a basic and required first step to sound or improved environmental management in refugee-hosting areas. A framework for such an assessment already exists for refugee and IDP communities, as developed by UNHCR and CARE International and could be modified for the current context.<sup>2</sup>

NRC should also consider undertaking the same assessments for those existing camps, since this might assist with the preparation of camp phase-out and closure plans and preparations. This is also an important precursor should any degree of environmental or landscape rehabilitation be required when camps close.

Currently, NRC is not involved in re-forestation projects. As a possible means of appeasing the Government of Burundi, however, NRC and UNHCR (in collaboration with relevant government ministries, such as the Ministry for the Environment, Forestry, and the Interior) should begin to plan a series of re-forestation initiatives, which should, by preference, be community driven. This would also be in line with NRC's Climate Change Position Paper, as afforestation and agroforestry have both climate adaptation and mitigation benefits. Clarification of a number of legal aspects, such as assess, ownership and benefit sharing, is likely to be required should this be considered.

## **Recommendations**

- NRC should conduct rapid environmental assessments at all existing camps and the planned camp in order to provide baseline data. This will facilitate the monitoring of future forestry resource management (see UNHCR/CARE Rapid Environmental Assessment tools).
- NRC, in collaboration with other partners (i.e. UNHCR and AHA) should develop Community Environmental Action Plans for all camp-affected areas. These plans will provide a mutually acceptable mechanism for the management of local natural resources (see UNHCR/CARE Community Environmental Action Plan tool).
- UNHCR and NRC should initiate a re-forestation programme in refugee-hosting areas, in collaboration with the relevant line ministries and local environmental NGOs.

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<sup>2</sup> FRAME Toolkit (UNHCR/CARE International 2005). This will shortly be available on line at <http://www.unhcr.org/protect/3b94c47b4.html> or can be provided directly by ProAct Network.

## 2.4.2 Camp Firewood Procurement, Use and Management

NRC insists that all wood suppliers have the requisite paperwork and permission to harvest wood legally. While it is acknowledged that corruption exists in relation to obtaining the correct paperwork for the harvesting of wood, it is felt that NRC is currently doing everything within its capacity to ensure that the wood supplied to the camps originates from officially designated sources.

The supply of *Eucalyptus* species is considered appropriate since it is considered, locally, to be appropriate for both firewood and charcoal making. It would not be appropriate for NRC to procure indigenous species for use in the camps, since this will have negative environmental consequences.

The wood procured by NRC is newly cut and therefore not dried. No provisions exist for the protected storage of wood in any of the camps and hence wood supplies are open to the elements. The result is that beneficiaries receive wood that has a high water content.

Fresh felled timber contains up to 60 per cent water. Ideally, wood should be dried for between 6-12 months, depending upon the water content of the wood and the climatic conditions. While scientific procedures can be used to establish the water content of wood, it is considered more appropriate for NRC to conduct comparative water boiling tests – see relevant tool in annex – using fresh wood and comparing the results with wood that has been dried for one month, wood that has been dried for two months and so forth until wood dried for 6 months has been tested. This should help establish the most realistic duration for wood drying in the Burundian context.

Heat energy comes from dry wood. During the burning process, heat energy is used to convert the water content of the wood into steam. Evidently, the lower the water content of the wood – i.e. the drier the wood is – the less energy will be required to convert the water into steam, thus producing more heat energy for actual cooking. The provision of freshly felled timber, combined with unprotected storage at the camps means that at least 60 per cent of the calorific value of the wood is consumed by converting water into steam, rather than providing thermal heat for cooking. Ultimately, more fresh/unprotected wood must be consumed than if dry wood was provided. Comparative water boiling experiments in rural Kenya, for example, showed a 57 per cent saving in firewood consumption (and a 49 per cent saving in cooking time) when dry wood was used, rather than freshly cut wood.

Fresh/unprotected wood also emits more smoke than dry wood. Smoke emissions are hazardous to health and can result in a higher incidence of respiratory diseases/problems and eye infections (the elderly, children and sick are particularly at risk). The health hazards of using undried wood are exacerbated by the fact that the beneficiaries use wood as a source of heating in their shelters during the night. All family or household members are thus exposed to emissions.

[Photo A2 Wood storage area, Gasorwe](#)

The quantity of wood supplied on a unit basis differs with each camp. In Gihinga, the quantity of wood supplied is the lowest, since briquettes are also distributed in that camp. The briquettes are manufactured by a co-operative based in Bujumbura whose aim, among others, is environmental protection and restoration.

NRC acknowledges that the quantity of wood supplied to both Gasorwe and Musasa camps is in excess of these camps' needs. It is currently changing the means of calculating wood distribution needs, with the objective of reducing overall supplies: the method of calculating firewood needs should be empirical and participatory.

Direct observations confirms that NRC is correct in concluding that excess amounts of wood are currently supplied, since charcoal making is taking place directly in front of the wood storage area, suggesting that a proportion of the wood that is distributed is being used as a source of income generation.

Current firewood consumption is also far greater than could be achieved if NRC ensured that it provided seasoned (dried) wood to the camps, provided appropriate camp-based storage facilities and embarked upon awareness-raising activities relating to good wood storage practices at the family level. Camp-based wood storage facilities should be located in a well-drained area, with some form of roofing and with walls reaching 75 per cent of the height of the structure (thus providing ventilation). The floor of the storage area should be made from stones. Wood should be piled horizontally, on low platforms (30cm) from the floor.

All families should be encouraged to split wood. Ideally, the wood should be no more than 50cm in length, and have a diameter of no more than 4cm. Ideally, split wood should be dried for a period of three months, although this may be unrealistic. If however, refugee families are encouraged to build cooking shelters that include a wood-drying rack above the cooking area, a drying period of one month is considered sufficient. It is important to note that implements for splitting wood must be provided, e.g. machetes. Protection/security issues must be considered prior to the introduction of such implements.

#### [Photo A3 Charcoal making in front of wood store, Gasorwe](#)

Institutional cooking facilities such as schools, hospitals and police units are also provided with wood. It is considered important that institutions adopt fuel-efficient cooking practices, since they are visible to the broader community, and in this sense, they set an example to the rest of the community and by doing so, encourage others to adopt such practices. Such institutions, however, do not appear to be actively encouraged to use fuel-efficient stoves or good cooking practices. As an example of good practice, such institutions should be encouraged and assisted to rectify this situation.

Experience has shown that the development of Community Environmental Action Plans (CEAPs) are an effective approach to managing the local natural resource base in refugee/IDP-affected areas. This is an all-inclusive approach to environmental management and involves the participation of both refugee and host community groups. The process encompasses gathering baseline information, identifying stakeholder needs/problems and encourages all stakeholders to work together to

achieve common goals in managing environmental resources. The sense of ownership and clearly identified roles and responsibilities not only strengthens environmental management, but can also be an important tool in reducing tensions between refugee and host communities. Developing CEAPs would not only improve fuel-related management issues, but extends to other natural resource-based and livelihood issues, and could assist communities in identifying and adapting to climate risks that may already be being experienced.

Some possible additional benefits of CEAPs are outlined in the Camp Management Toolkit (pp175-176).

The success of a CEAP is dependent upon funding, having agreed on realistic goals, good project planning and implementation, and creating a true participatory environment. An initiating agency – NRC/UNHCR in this context – must ensure that it has the skills and resources to support a CEAP least it negatively influences the level of trust between the agency and stakeholders, which can affect other activities. NRC may therefore wish to initiate or co-ordinate the development of such plans in all three camp areas.

### **Recommendations**

- A thorough empirical assessment needs to be conducted of real firewood needs at household levels in all camps. NRC should conduct knowledge, attitude and practices studies relating to the use of firewood in all camps.
- Awareness of stove management and best cooking practices should be increased (see UNHCR, 2002 for further guidance). Households should be encouraged to create small storage sites, e.g. in the roof space of shelters, for storing and drying small quantities of split wood.
- Households should be encouraged to split wood before burning as this both enhances the speed of drying and the calorific output of the wood. If households do not have the means to do this – for security reasons this is sometimes an issue – then the wood should be split before distribution.
- If possible, NRC should procure dried wood from suppliers. Alternatively, covered and protected stockpiles should be established at strategic locations within camps. Covered and ventilated wood storage areas should be constructed at each camp in order to ensure that the wood remains dry until it is distributed. Households should then be encouraged to keep wood dry in e.g. cooking shelters. The use of dry wood will result in lower rates of firewood consumption (between 10-15 per cent).
- All police posts and camp institutional cooking facilities should use fuel-efficient stoves and receive awareness-raising on fuel-efficient cooking practices.
- NRC should encourage beneficiaries to construct cooking shelters at Gihinga and Musasa (see photograph of a cooking shelter below). An ideal cooking shelter should be protected from the elements, have a cooking area, a wood-drying rack above the cooking area and space for the storage of fuel. This should relate

directly to sensitisation exercises and could possibly be linked to incentives (e.g. the provision of warm clothing, or additional blankets). The use of cooking shelters should result in firewood saving of between 5-10 per cent.

[Photo – cooking shelter at Gihinga camp](#)

### **2.4.3 Cooking Hardware**

Beneficiaries are given two metal cooking pots as part of their non-food items donation. Lids were observed to be used in most cases. The metal pans are relatively thin and, while they may be appropriate for the boiling of water and frying foods, they are less appropriate for cooking and simmering food stuffs that take a long time to cook. Clay pots would be more suitable for the cooking of these food items, e.g. beans.

Current provisions of cooking hardware thus fail to take into account the nature (i.e. cooking requirements) of the food-stuffs given as part of the refugee food basket. The cooking of hard food-stuffs such as beans, for example, requires long, slow cooking. Thin metal cooking pots waste significant amount of energy when used for this type of cooking.

### **Recommendations**

- Following consultation with beneficiaries, clay pots should be distributed to beneficiaries as they are more fuel-efficient for the cooking of hard food stuffs, such as beans.
- Wherever possible, NRC should provide opportunities for camp-based milling of hard food-stuff, where relevant.

### **2.4.4 Food Rations**

Beneficiaries receive dried beans or peas, maize meal, rice and soya as part of their food rations. Hard, dry foods, however, require a relatively long cooking time, thus leading to high wood consumption rates.

In some camps, home gardens have been established and fresh vegetables are grown. Feedback from focus group discussions in each of the three camps suggests that a proportion of food rations is commonly sold or exchanged for the purchase of firewood and, possibly, fresh food, where home gardens are absent. This may be understandable in the case of Gihinga – since they are given limited wood rations – but it is unclear why this should be the same at Gasorwe and Musasa, where wood rations are considered to be in excess of needs. It is likely that this finding has bias in Gasorwe and Musasa.

Making provisions for beneficiaries to produce their own, fresh food not only improves their diet and health status, but involves the cooking of foods that take a relatively short time to cook which, in turn, contributes to a reduction in firewood consumption. NRC should encourage the refugee communities to consult with host community members regarding the identification of the most appropriate crops to

plant, including those that are resistant to drought or inundation during floods, as a way to address climate risks.

## **Recommendations**

As in Gihinga, NRC should try and ensure that land is made available for the cultivation of some fresh foods, taking into account water supply, soil status and land availability. Establishing co-operatives to work limited amounts of land for the production of fresh crops should be considered as an income generating opportunity. Where space is at a premium permaculture practices might be introduced, for example, using raised beds or tyres filled with earth and compost.

### **2.4.5 Conservation Measures**

Proper wood storage and preparation is an essential and important conservation measure when trying to economise on the amounts of firewood used in camp situations. The mission noted considerable variance in this regard between camps. Most families in Gihinga, for example, camp store wood inside their shelters, but this was not the case in Gasorwe where wood was left unprotected, outside shelters. The latter is considered peculiar, as shelters are organised around communal cooking areas that are protected from the elements, but could readily accommodate the wood. The reason for this remains unclear but could be a cultural issue or, again, the fact that with wood being so freely available, there is no pressure on communities to economise.

#### [Photo of communal cooking areas and wood outside shelter - Gasorwe](#)

In Gihinga camp, approximately 30 per cent of families have constructed cooking shelters, some of which are quite elaborate structures. A visit to one shelter revealed that it included an area for storing wood/briquettes, a cooking area, and a wood-drying rack above the cooking area. Protecting cooking places from the elements – both wind and rain – improves the efficiency of wood burning, and hence cooking. Drying wood also increases its calorific value and hence results in a reduction in firewood consumption. The construction of external cooking shelters similarly reduces health risks, since the whole family is not exposed to smoke.

At the same camp, some families had also improved the thermal insulation of their shelters by increasing the thickness of the walls, using mud and animal dung. Improving the thermal insulation of family shelters reduces the consumption of firewood that is required for heating purposes.

The splitting of wood also optimises its conservation (i.e. management) and again improves its calorific value. While some families were observed to have split wood before cooking, the majority did not seem to follow this practice. Again, this was noted to be particularly common in both Gasorwe and Musasa camps, where wood rations are in excess of needs.

While sound preparation is one part of the answer to better conservation practices, the correct use of fuel-efficient stoves is another. All families at Gihinga camp possess a fuel-efficient stove, these having been distributed alongside the introduction of

briquettes in that camp. Observations suggest that the fuel-efficient stoves are liked by the beneficiaries – since their use is widespread – but that they tend to be used with firewood, rather than the intended fuel, briquettes.

The unit cost of the current fuel-efficient stoves was reported to be double that of earlier estimated costs. NRC may wish to consider the financial viability of the cost of the current fuel-efficient stoves and briquettes for the future. It should be noted that smaller – and cheaper – fuel-efficient stoves may prove to be adequate and more appropriate. Careful preparation, screening and introductions should accompany the testing or promotion of any future stove model(s).

#### [Photo of fuel-efficient stove - Gihinga](#)

In Musasa and Gasorwe, some beneficiaries had constructed clay fuel-efficient stoves. Traditional, three-stone fires were also being used – to varying extents – in all of the camps, although their use was very limited in Gihinga. The level of efficiency of the clay made fuel-efficient stoves is unknown, but should be tested.

#### [Photo of clay fuel-efficient stove and 3 stone fire - Gasorwe](#)

### **Recommendations**

- An awareness-raising initiative should be developed for the beneficiaries, relating to:
  - the storage and use of firewood;
  - fuel-efficient cooking practices;
  - the benefits of using fuel-efficient stoves – when used correctly;
  - the benefits of constructing cooking shelters; and
  - the benefits of adding thermal insulation to family shelters.
- Such an initiative should include women, vulnerable groups and children specifically. Existing educational and awareness raising materials for some of these topics already exist for such purposes (e.g. from the UNESCO PEER Refugee and Returnee Environmental Education Programme)<sup>3</sup> and would not need to be developed, but merely applied.
- The use of fuel-efficient stoves, combined with the adoption of good cooking practices can result in between a 25-30 per cent reduction in firewood consumption. NRC field staff should be trained to undertake formal studies into the efficiency of existing fuel-efficient stoves and cheaper, alternative fuel-efficient stoves before purchasing additional ones. This should be accompanied by internal NRC training on best cooking practices.

#### **2.4.6 Possible Fuel Options**

**Wood** – All of the beneficiaries consulted stated a preference for firewood as a source of domestic energy. While the expression of this preference is, in part, linked to

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<sup>3</sup> Materials have been developed and trialled already in French for use in DRC, thus should be readily applicable for the current refugee caseload. Materials are available from UNHCR.

cultural issues, it is more likely to be linked to the fact that charcoal can also be made from wood. The making and selling of charcoal – particularly in Gasorwe and Musasa camps – was widespread at the time of this mission, though insufficient time was available at the camps to quantify the scale of production. Charcoal production was also observed in Gihinga, although the scale appeared to be relatively insignificant at this site compared with other camps.

**Charcoal** – Charcoal braziers were observed to be widespread in all camps, suggesting that the use of charcoal is common. Charcoal making was found to be most common on the peripheries of the camps, with the exception of Gasorwe, where charcoal was also being made directly in front of the wood storage area. This suggests that wood being used to make charcoal comes from sources other than the wood rations. It is indeed likely that the wood is “harvested” from nearby private plantations that flank – at least in part – all camps.

NRC indicated to the Mission that complaints from these private plantation owners are rare. Bearing this in mind, the issue regarding the sourcing of wood for the making of charcoal requires further study. It emerged from a meeting with charcoal sellers at Mwaro that charcoal was being sold to the refugees.

#### [Photo of brazier](#)

**Briquettes** – Briquettes have only been introduced to Gihinga camp. The briquettes were complemented by the distribution of fuel-efficient stoves. Firewood rations were reduced by 75 per cent following the introduction of the briquettes.

The briquettes are made from a mixture of rice and coffee husks, wood chips and cotton, and cost 245 Burundian Francs, per kilogramme. These raw materials are purchased from a number of sources throughout the country. The co-operative currently supplies briquettes to the army, police and schools in the central area of the country. In addition to making briquettes, the co-operative also manufactures fuel-efficient stoves, designed to burn the briquettes. These range in size from family size stoves to ones intended for institutional cooking. The costs of the stoves are relatively high –US\$300 for example for an institutional cooking stove. The NRC has not purchased stoves from the co-operative due to the high unit costs, but it has used the design of the stoves as a basis for purchasing bespoke stoves from a cheaper source. The current stoves purchased by NRC cost US\$50 per unit, which is still considered high although this cost might be ameliorated if the stoves prove to be durable.

The focus group discussion at Gihinga indicated that the beneficiaries do not like to use briquettes because of the smoke produced, and the difficulties in lighting them. They also stated that they often sold a proportion of their food rations in order to buy wood or charcoal. An additional claim was that the reduction in firewood rations has led to illegal cutting, and that this has created tensions between the refugee and local population (although NRC states that it has received no complaints from local plantation owners regarding illegal tree cutting). The Mission notes that while these claims may have a certain level of credibility, they may be biased since firewood serves not only as a source of fuel for cooking and heating, but also has an economic value, particularly when used for charcoal making.

Direct observations at Gihinga suggest that briquettes are not often used – or are possibly only used when there are no alternative means of acquiring wood or charcoal.

One use noted for the briquettes was as a means to elevate cooking pots above the rim of the fuel-efficient stove. This, however, only further increases heat loss from the stove and is a practice that should be dissuaded.

#### [Photo of briquettes used to raise pan off rim of stove – Gihinga](#)

Currently, the provision of briquettes to Gihinga is four times more expensive than the provision of firewood. A meeting with the manufacturer of the briquettes suggested that while the company could supply all of the camps, the unit costs of the briquettes would be unlikely to reduce.

NRC has identified another company that makes briquettes<sup>4</sup>, but this firm is unable to produce the quantity of briquettes required for a refugee camp.

Assuming that NRC is able to source sufficient funds for the extension of the use of briquettes to both Musasa and Gasorwe, it is possible that other implementing agencies that may replace NRC – if it withdraws from camp management in Burundi – may not be able to continue to pay such costs. This would cause significant problems for UNHCR and potential implementing partners in the future.

**Solar cookers** – The Mission met with an agent selling solar cookers in Bujumbura. The parabola style cookers are imported from South Africa and the costs to the end-user are considerable, approximately US\$250 per unit. This is considered to be too expensive as an energy alternative in the current context – the design is also physically large – for mass distribution in a refugee setting. However, there may be opportunities in institutional settings for their use (e.g. the liquefying of oil), if certain conditions and cultural issues are satisfied (see below).

There are alternative locally made and cheaper solar cooking options, such as one based on the “cook-it” design. These stoves consist of a series of cardboard panels – constructed to have the same effect as a parabola – covered with aluminium foil. This cheaper (1,000 Burundian Francs per unit) alternative, however, is not considered sufficiently durable to be an option in a refugee setting, since it is easily damaged. Once damaged, the stove no longer works.

The durability of the cook-it design, climate and socio-cultural barriers to acceptance of solar cookers do not make them a viable option, even during the four-month dry season. If such cookers were introduced, and firewood rations reduced, it is highly likely that beneficiaries would simply obtain wood from other sources. Thus, while relatively inexpensive, this option is not considered sufficiently durable for consideration, nor does it have an application at an institutional level.

In practical terms, solar cookers cannot be used in the early morning, when cooking/tea making activities occur, since the sun is relatively weak, due to its obliqueness,

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<sup>4</sup> [ADLP: Association pour le Développement et la Lutte contre la Pauvreté](#)

thus yielding little energy. The same applies on an evening time, as the sun descends towards the horizon. In the mountainous regions of Burundi, these effects are further compounded (due to relief, altitude and weather).

Compounding the suitability of solar cooking are socio-cultural and practical issues related to their use. Cooking using a fire serves more than just a food preparation function. It provides a source of warmth, gives relief from insects and provides an opportunity for social interaction. Solar cookers do not provide these additional functions. Typically there is a considerable degree of scepticism relating to how solar cookers actually work, which discourages their use. The practice of leaving cooking pots unattended for extended periods of time is generally considered taboo in many African cultures, since the fear of unattended food being poisoned is common. This presents an additional barrier to the acceptance of solar cookers. A similar experience has been recorded in other Congolese refugee situations, e.g. Rwanda and Tanzania, so is not unique to this present context.

[The use of large solar panels and battery storage facilities might, however, be considered for water pumping and/or providing lighting in sensitive areas of camps such as around latrines. The latter, in particular, can serve a useful protection role.]

[Photo of solar parabola – BJM](#)  
[Photo of cook-it kit](#)

**Biogas** – Biogas technology has many potential uses. By providing an alternative source of fuel, biogas can replace the traditional dependency on biomass-based fuels, particularly wood. In addition, biogas has both climate mitigation and adaptation benefits, as it substitutes the burning of wood and offers an alternative for using natural resources that may be degraded under climate change.

Biogas systems also produce a residue organic waste, after anaerobic digestion, that has superior nutrient qualities as it is in the form of ammonia. Biogas systems also have considerable social implications for communities as it relieves the often daily burden of searching for and preparing biomass-based fuels, a role commonly filled by women and young girls. They also help reduce the likelihood of chronic diseases associated with the indoor combustion of biomass-based fuels.

Space is another consideration. A small 3m<sup>3</sup> family sized plant requires about 27m<sup>2</sup> of land when the area for the plant and a compost pit for the slurry is taken into consideration, which in the current context is not practical. Water availability and the need for animal manure may impose further constraints on the viability of biogas technology in a camp setting. To function properly, a biogas digester requires feeding a mixture of cow dung and water in a ratio of 1:1 or 4:5.

Evidence from pilot studies in refugee settings in other parts of Africa have concluded that human waste materials from persons that have dietary limitations (such as those in a refugee setting) does not produce sufficient biogas to make it a viable option.

A final consideration in relation to biogas technology relates to cost. This will vary according to the size and model of digester chosen, but one of the cheapest systems currently being used in Africa costs approximately US\$100-120 per unit. This system

does, however, require the excreta from 1-2 cows, 5-8 pigs, or four humans on a daily basis, in addition to water. The 4m<sup>3</sup> volume digester produces 1m<sup>3</sup> of gas per day, equivalent to 0.5 litres of kerosene.

Integral to biomass technology, and the philosophy it represents, is the requirement of self-reliant communities to manage and maintain the systems. Such a requirement is rarely found in refugee or IDP situations, but can work more effectively amongst host communities.

In the present Burundian context, NRC has considered the use of biogas technologies as an alternative fuel source in the camps. It has, however, also already concluded that its use in the camps is not viable, a decision that the Mission agrees with for the above reasons.

**Peat** – The use of peat as a source of fuel is relatively common in those areas where it is locally harvestable. Peat does require long and careful drying and storage once it is dry. Experience from other refugee situations where peat has been trialled indicates that people do not like to use peat since it is difficult to light, is a slow source of heat energy and can produce excessive quantities of smoke, unless specific ventilation systems are put in place.

From an environmental point of view, the use of peat as a source of fuel is not sustainable, since it takes hundreds of years for peat to develop. Additionally, peat is associated with wetland habitats that support local community livelihoods in a number of ways.

The Ministry of Environment commented during a meeting with the Mission that the cutting of peat for fuel was responsible for the destruction of wetland habitats in the country and that it should be discouraged. The commercial harvesting of peat (for supply to the refugee camps) would exacerbate an already existing environmental concern of the government. Given the above, peat is not considered to be a viable option as a source of fuel in this context.

**Kerosene** – The use of kerosene as a cooking fuel is a non-wood based option in refugee settings. The introduction of kerosene would, however, necessitate the dissemination of kerosene-burning stoves, the building of safe on-site storage facilities, transportation and safe family storage facilities. The risk of fire and related accidents when using kerosene is considerable. The costs and safety issues relating to the use of kerosene generally do not make it a viable option.

**Other** – The use of electricity and gas was also briefly examined. Electricity existed in Gasorwe camp, but the infrastructure has been stolen and is unlikely to be replaced. Apart from Gihinga camp the most homogenous settlement – the use of gas could be a fire hazard risk as there may be a temptation to deliberately cause fires. This option would also prove quite expensive as it would by necessity require new cookers and stoves to also be purchased or provided. Gas or electricity are seldom used in refugee or IDP situations for these reasons.

## **Recommendations**

- Wood is, and is likely to remain, the favoured preference of refugees for cooking. It is recommended that a practical management plan be drawn up immediately for the harvesting, transportation, storage and distribution of firewood to camps. This must be accompanied with a comprehensive assessment of real supply needs at the household level.
- While refugees at Gihinga claim not to like the briquettes, there is little evidence of illegal tree-cutting or charcoal making. Briquettes are a viable alternative energy source and appear to be accepted, where access to firewood is limited and/or controlled. The use of briquettes should therefore be continued at Gihinga camp, but people should be encouraged to use the briquettes only for the purpose for which they are intended.
- Before considering its application in the other camps, the briquette design should be improved, in consultation with beneficiaries at Gihinga. If 70 per cent of the current wood rations in all camps was replaced by briquettes, this would result in a 70 per cent reduction in firewood supply / consumption.
- Contrary to UNHCR's environmental guidelines, charcoal is produced in all of the camps. The production of charcoal within the camp boundaries should be actively discouraged by NRC, in co-operation with the camp police. Identifying the correct level of firewood delivered to camps is a starting point, as this will create a natural shortage of wood for transformation to charcoal. The introduction of such limitations should be linked with the participatory development of alternative income generating activities for existing charcoal producers (e.g. co-operative market gardens).
- The introduction of solar cookers should only be considered at an institutional level, and only where food preparation is not intended.
- The introduction of peat, kerosene or biogas is not viable in the refugee context in Burundi.

### **2.4.7 Cooking Practices**

Focus group discussions and direct observation of cooking practices indicated awareness of the following fuel-efficient cooking practices:

- the use of pan lids;
- extinguishing fires immediately after cooking;
- pre-soaking dried foods;
- use of bicarbonate of soda to reduce cooking times for beans; and
- bulk cooking.

It should, however, be pointed out that this refers to an awareness of fuel-efficient cooking practices only and should not be seen to translate into the application of such practices. While the use of pan lids was commonly noticed in the camps, there was

little evidence of the use or application of any of the other fuel-efficient cooking practices mentioned above.

There are other fuel-efficient cooking practices that could be adopted, including double cooking, grinding or milling, cutting food into small pieces and/or the use of stones on pan lids to create a pressure cooker effect. The potential for raising awareness of these practices is therefore considerable – particularly in Gasorwe (due to the existence of communal cooking areas) and Musasa (where currently, this is also the case for the majority of beneficiaries).

The limited awareness of fuel-efficient cooking practices observed restricts family level firewood management/consumption and thus, again, results in greater quantities of firewood being consumed).

### **Recommendations**

- The adoption of fuel-efficient cooking practices greatly augments other energy-saving interventions that NRC may introduce (e.g. fuel-efficient stoves). NRC should organise camp-based awareness programmes at the community and household levels. Consideration should be given to establishing demonstration centres of best practice at strategic locations in the camps.
- Following an intensive awareness-raising project, NRC should continue to monitor cooking practices, and continue to provide further training/advice where necessary.

#### **2.4.8 Training and Participatory Techniques**

NRC reports outline a number of training and awareness-raising initiatives that have taken place in Gihinga refugee camp. These include:

- beneficiary sensitisation mission to the briquette manufacturers in Bujumbura;
- camp meetings with women's groups, teachers, parents, camp leaders, the environment club; and
- training in the use of the briquettes and fuel-efficient stoves.

While these interventions are commendable, it seems that other opportunities for raising awareness and participatory project/initiative development are not being exploited fully. One example of this relates to the fact that while NRC is involved in participatory activities relating to firewood management, the lack of visibility in the field of such activities suggests that they are limited, or are not being as effective as intended.

NRC field staff may require capacity building in participatory initiative development if the recommendations in this report are to be executed. Participatory firewood management planning, for example, with both refugee and host communities, would strengthen and augment current initiatives. Community Environmental Management Planning is a solid foundation upon which to develop and strengthen participatory initiatives.

## Recommendations

- Training should be provided to NRC and AHA staff in the development of Community Environmental Management Plans, rapid environmental assessments and the development of an awareness-raising project for beneficiaries to enable staff to further develop their participatory skills, and are thus provide training and advice.

## 2.5 BUDGET IMPLICATIONS

This section gives an initial estimate of potential costs and budget implications of the recommendations and considerations outlined in this section of the report.

It is estimated that the implementation of these activities will help NRC reduce the use of firewood by 40-55 per cent. Additional indirect benefits should also be anticipated through the introduction and practicing of more participatory-based approaches, which should have broader and positive implication relating to camp management. The savings related to a reduction of wood of 55 per cent are estimated at US\$5,600 per month or US\$67,200 per annum (based on available wood distribution and cost data).

Should NRC decide to implement the use of briquettes in all three camps – despite the cultural and practical drawbacks highlighted in this report – the additional cost of camp fuel provision is estimated at US\$13,500 per month. This is based on figures available at the time of the report and should be refined by NRC with latest data for a more precise figure.

Activity	Requirements	Cost (US\$)
1. Preliminary training for NRC and UNHCR staff on Rapid environmental Assessment and Community Environmental Action Planning	Consultant (French speaking) Visa/DSA/travel Time required: 9 days preparation to allow selected site visits and tailor materials to local situation. 3-day training event Follow-up	35,000
2. Training for NRC staff on participatory techniques	Consultant (French speaking) Visa/DSA/travel Time required: 6 days preparation and 2-day training	25,000
3. Conducting Rapid Environmental Assessments (assume 4 sites)	Consultant (French speaking) Visa/DSA/travel Time required: 8 days preparation, site visits and write-up	25,000
4. Re-forestation programme	(This would require further elaboration with e.g. IUCN, national authorities and local stakeholder groups.)	100,000

<b>Activity</b>	<b>Requirements</b>	<b>Cost (US\$)</b>
5. Calculating firewood needs / Knowledge Attitude and Practices studies	Consultant (French speaking) Visa/DSA/travel On-site assessment Training Monitoring/plan development Time Required: 20 days (4 days/site)	50,000
6. Incentives for building and using cooking shelters	Warm clothing or additional blankets	10,000
7. Provision of clay pots	Local procurement possible	5,000
8. Covering and protecting wood stockpiles	Local procurement possible	3,000
9. Awareness raising activities (firewood management, cooking practices, use of fuel-efficient stoves)	Training of NRC camp staff/ community mobilisers  Time required 3 months	25,000
10. Efficiency test of current fuel-efficient stove	Independent energy expert Visa/DSA/travel Time required: 3 days	15,000
11. Improvement of briquette design	NRC to work with Bricoop and energy expert(s)	5,000
12. Establishing alternative income generating activities	NRC to collaborate with AHA	20,000
<b>Total for firewood related recommendations</b>		<b>318,000</b>

## 2.6 TOOLS

Tools that have been developed as part of this study to help achieve the above recommendations are:

- Cooking knowledge, attitude and practices assessment.
- Stove efficiency assessment.
- Charcoal production assessment.
- Wood consumption.

These tools are attached in Annex I - IV to this report.

## 2.7 REFERENCES AND RESOURCES

FAO. 1990. Guidelines for Planning, Monitoring and Evaluating Cookstove Programmes.

GTZ. 2007. Fuel Efficient Stoves Review Uganda.

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### 3. SUSTAINABLE CONSTRUCTION OF SHELTERS AND SCHOOLS

This section aims to analyse the approach adopted by NRC in the construction of houses, latrines and social infrastructures, and propose considerations for improvements or possible alternatives for the use of materials that might have limited adverse environmental impact.

#### 3.1 BURUNDIAN CONTEXT

The most commonly used construction materials and associated local environmental issues in Burundi are:

- **bricks and tiles** – Vulnerable marshland habitats are being exploited for clay used in brick and tile making, though this is not exclusive to the refugee or returnee programmes underway. Nonetheless, there are no restrictions on this practise, nor area there any rehabilitation programme planned for these areas.
- **timber** – Although there are no recent or exact figures, it is estimated that approximately 5 per cent of current wood consumption in Burundi is used for construction purposes, including firing bricks.

The two most popular tree species for construction use in Burundi are *Eucalyptus* and *Grevillea*. *Eucalyptus* is an exotic tree species that was introduced to East Africa in the late 1890s. It is a popular tree variety in Burundi, favoured particularly for construction and energy use as it is fast-growing species which regenerates several times when harvested correctly. *Eucalyptus* can also grow in difficult conditions and is the choice species for private plantations. However, *Eucalyptus* is very competitive and has a high water demand. It strips the soils of nutrients and cannot be planted in conjunction with other species.

*Grevillea*, in contrast, is a versatile and popular tree for farm forestry. It originates from Australia but was brought to Africa by European settlers from India and Sri Lanka. There is little competition between *Grevillea* and neighbouring crops. It has been extensively used for shade for coffee and tea plantations and provides economically valuable products, including timber, poles and firewood. It is easy to propagate and establish and can grow in low-fertility soils. It does not compete strongly with adjacent crops and tolerates heavy pruning. The growth rate of the species, however, is relatively modest.

- **cement** – All cement in Burundi is imported from neighbouring countries, primarily Uganda, Tanzania and Zambia.
- **iron sheeting** – Iron sheeting is frequently used for roofing of various types of buildings. It is also imported, mainly from Kenya and Uganda.
- **other commonly used materials** – Other commonly used materials include the use of thatch or banana leaves for roofing in rural areas, and mud bricks – which are much more common than burned bricks – for walls.

### 3.2 SHELTER TYPES AND MATERIALS

The NRC Burundi shelter programme has been running since 1997. It contributes to the re-integration of returnees, to increasing primary school capacities through the construction of classrooms, and to ensuring adequate housing and social infrastructure for refugees and asylum seekers.

It targets Burundian returnees in the provinces of activity, as well as Congolese refugees, vulnerable groups and asylum seekers.

The main shelter construction projects are:

- houses for returnees, made of adobe and iron sheet roofing;
- temporary classrooms with a wooden structure;
- semi-permanent classrooms with an adobe structure;
- permanent classrooms which have a reinforced concrete structure; and
- school latrines – temporary, semi-permanent and permanent.

Beneficiaries contribute to the various constructions through a number of ways, for example, by providing mud bricks, by digging pits for house and latrine construction, by collecting materials and/or by helping dig the foundations for services such as a school.

Since 1997, approximately 13,000 shelters have been constructed for returnees and the host population, in addition to more than 800 classrooms. In addition to construction and repairs, sensitisation sessions facilitated by NRC social workers have been conducted on various themes including “Environment and Education”.

Each family receives 50 tree saplings upon completion of their shelters. According to NRC staff, the survival rate of these saplings is only 25 per cent. It is unclear however, if the beneficiaries plant all of the 50 saplings or not. Direct observations suggest that the land to the rear of each shelter is not large enough to accommodate the planting of 50 saplings, in addition to the planting of land for crops. NRC does not give fruit tree saplings to the beneficiaries – it gives *Grevillea* – and nor does it consult with people regarding the most appropriate tree species to plant. These issues contribute to what may be regarded as a poor survival rate.

### 3.3 METHODOLOGY

Two main techniques were used for data collection. These were:

- **Meetings:** These focused on the collection of background and current information on the Burundian construction industry and materials, as well as local practices and local environmental issues.

Meetings were held with the following:

- PARESI, Ministère de la Solidarité National de la Reconstruction.
- Boutique Metha, a local supplier.
- The Ministry of the Environment.

- **Site visits:** Site visits were made to different types of NRC shelter projects including temporary and semi-permanent classrooms (Mageyo-bas and Mageyo-haut/Mubimbi) and permanent classrooms and shelters for returnees (Tura/Giterany). Such visits were carried out in co-ordination with NRC shelter technicians and staff. Construction plans and detailed bills of quantities were provided by NRC shelter staff.

### 3.4 FINDINGS

#### 3.4.1 Schools

The Mission visited three different types of classroom structures constructed by NRC. All of the schools follow a standard NRC design, with some adaptation to local conditions. The following outlines the findings relating to each type of structure.

**Temporary Classrooms.** These classrooms use a wooden structure made of *Eucalyptus* poles, plastic sheeting, nails and iron sheets for roofing. On average, a total of 108 trees are cut to provide the poles for construction. Wooden poles are treated with used engine oil to protect them from termite infestation. The total area of plastic sheeting used is approximately 185m<sup>2</sup> and 40.5 corrugated iron sheets are used for the roof. The unit cost is less than US\$1,300 and the average longevity of the structures is around five years. Such structures have been erected by NRC as a quick response to the increasing number of returnees settling in the area.

Photo: Temporary structure in Mageyo-Bas

**Semi-permanent classrooms.** These schools are constructed from adobe (mud) bricks, *Eucalyptus* wooden poles and iron sheets. Their foundation is of mud and stones and the walls are made of mud bricks wall, with a reinforced concrete ring beam. *Eucalyptus* poles and iron sheets are again used for the roof framework and roof, respectively. The foundations and the first 50cm of the walls are made from stone in order to further protect the structure from damage by moisture. Wooden poles were again treated with used engine oil in order to protect them from termite infestation.

The cost of such buildings is around US\$3,500. The average longevity of these structures is estimated to be 15-20 years, providing the bricks are protected from moisture.

Photo: Semi-permanent structure in Mageyo-Haut

**Permanent schools.** The permanent structure follows a standard NRC design, with modifications in order to meet school construction standards laid down by Burundian law. The structure is made of stone and cement foundations, a reinforced concrete structure filled in with fired bricks, and a metallic framework covered by iron sheets. The longevity of the structures is expected to exceed 30 years with adequate maintenance. The cost of these schools, with latrines, is approximately US\$12,000 per equipped classroom.

Photo B3 : Permanent structure near Giterany

**Latrines.** The latrines visited at the school sites were ventilated improved pit (VIP) latrines and permanent structures. VIP latrines offer improved sanitation conditions by eliminating flies and odours through better ventilation systems: the addition of a chimney draws air into the structure. In this instance, the depth of the pits was 7m and they were not designed to be emptied. The volume of waste reduces naturally during the dry season, making them a viable option in this situation. The latrines visited were adequately sited by the local administration.

Photo: Permanent latrine structure, Giterany Camp

#### **Additional Observations:**

- The siting of NRC classrooms and latrines is done by the local administration.
- Furniture for all classrooms is purchased locally and made from *Grevillea* wood.
- Adobe bricks are made by excavating local soils that have some clay content and removing the first 50-100cm of topsoil, which is discarded. The bricks are then compressed manually with wooden blocks and left to dry for five days.
- Several open pits resulting from the excavation of soil for adobe bricks were observed around the classrooms. These are a potential hazard, particularly if they fill with water as they become potential reservoirs for disease carrying vectors such as mosquitoes. Children and small animals can also easily fall into such voids.
- Local contractors are used to supply local materials, which are screened for quality control. Contractors are also responsible for recruiting and paying for manpower.
- NRC consistently checks wood supplier certificates to ensure that the timber is from legal sources.
- No water facilities or rainwater collection structures were observed near the semi-permanent and permanent classrooms visited.
- All structures appeared to have adequate drainage channels.

#### **3.4.2 Resettlement Area**

The Mission made a field visit to a resettlement area, where returning Burundians are currently establishing their homes. NRC is involved in this process through the provision of materials and labour for the construction of family homes to returnees and vulnerables. The homes are basic 5m x 7m structures made of adobe bricks, *Eucalyptus* poles, a *Grevillea* door and window frames and iron sheets. The beneficiaries contribute to the construction of their homes by digging latrine pits, making the bricks and helping the mason hired by NRC.

Photo: Returnee house, in Giterany

**Additional observations:**

- A number of local houses have either tile roofing or iron sheet roofs. While tile roofs are cheaper than iron sheeting (and lasts approximately the same amount of time), the shelter requires a greater level of reinforcement to support the additional weight associated with tiles.
- Some beneficiaries have planted banana trees in the pits left open from mud excavation. This is a useful practice which can be combined with composting, using the pits as a disposal pit for biodegradable materials and kitchen waste.
- Examples of rainwater collection recipients and systems were evident.
- NRC gives 50 saplings (*Grevillea*) per family following the completion of a home. It is not clear how many are planted, but follow-up from NRC reported that on average, 25 per cent of the saplings have been observed to exist after one year. Apparently the decision of the species given was not made with the involvement of the beneficiaries. Such a lack of consultation is often found to be a reason for poor survival rates though there are other contributory factors, including limited compound space and the need to optimise family gardens for food production.
- While many of the returnees are aware of how to make clay fuel-efficient stoves from their time in refugee camps in Tanzania, there is not a widespread use of such stoves. This indicates that firewood is widely accessible and there is no incentive to use such stoves. Where shortages are present, beneficiaries would use skills, such as making fuel-efficient stoves, in order to reduce the amount of wood consumed.

**3.4.3 Materials**

A visit to a local supplier and discussions with NRC staff revealed that NRC Burundi shelter staff have excellent knowledge of the origin and production techniques of all materials used in the above shelter projects and that the advantages and disadvantages have been carefully considered before selection. A NRC logistics database – which has recently been launched – keeps track of supplier and contractor performances.

Local materials including wood, stones, fired bricks and mud are all sourced locally by contractors. NRC demands certificates for the wood but cannot be certain as to the exact origin of this product. Stones and fired bricks are usually bought locally, minimising the needs for transportation. Mud for adobe bricks is usually excavated on-site.

Construction in this context is dependent on a range of suppliers and sources, as indicated below:

- aluminium and/or zinc coated metal roofing sheets originate from Uganda or Kenya;

- nails are either imported from Egypt or else the basic material is imported from South Africa and the nails are then made in Bujumbura;
- nails for fixing iron roofing sheets come from China;
- the only currently available brand of cement in Burundi is from Uganda, though it can occasionally also be purchased in Tanzania and Zambia; and
- both China and Russia provide the bar for reinforced concrete.

Goods are usually transported by boat to Dar Es Salaam or Mombasa and then overland via Kigoma or Kampala and Bujumbura.

### **3.5 CONCLUSIONS**

NRC Burundi Shelter staff have an excellent overview of their programme and in-depth knowledge of the origin and production techniques of all types of materials used in Burundi shelter projects. It appears that all materials and construction techniques have been carefully considered taking environmental factors into account in addition to cost effectiveness.

The unavailability of certain materials in-country and the limited availability of imported goods such as iron sheeting and cement means that there is little scope for further improvement at present.

Some recommendations are made below with regard to local materials, water supply and sapling distribution.

The main issue arising from site visits relates to the selection of roofing materials. Currently, iron sheets are favoured over locally made clay tiles. Clay tiles, though, are half of the cost of iron sheeting and equally as durable. However, the use of clay tiles involves more poles for the construction of a shelter (to support the weight of the poles) and also requires wood to fire the tiles. This presents a trade off between the two roofing materials options for NRC. It is felt that the use of iron sheets is valid, since it does not involve the use of local natural resources to make or install.

Having visited other schools and buildings made of adobe bricks and that are adequately protected and maintained, it appears that semi-permanent school classrooms would be adequate permanent buildings. NRC estimates that such structures, if well maintained, are expected to last between 20 to 30 years. NRC however, is obliged to build schools according to specifications from the Ministry of Education. These specifications do not accommodate the use of adobe bricks for the construction of permanent schools.

### **3.6 RECOMMENDATIONS**

- NRC should ensure that pits resulting from the making of adobe bricks are back-filled and that the top soil is returned. This not only helps remove a potential hazard from the landscape, but also frees up the space for either construction, tree planting or local agriculture. Alternatively, if the pit is used as a compost site, banana or papaya trees may be planted in the pits, which should nonetheless still be partially filled in.

- NRC should consider the introduction of rainwater harvesting from structures with corrugated iron roofs, as well as where schools do not have access to local water supplies. This has multiple benefits, from reducing run-off which can cause soil erosion and gully formation around houses (which can then become filled with waste and stagnant water) to being able to water trees and crops with “waste” water, to having water to improving hygiene conditions in schools..
- The selection and distribution of tree saplings should be revised in consultation with the beneficiaries – primarily to determine their preferences – to improve survival rate. The provision of any goods like saplings should ideally be linked with some form of “payment”, which is normally a strong incentive for people to then look after the sapling.
- Once consultation on the choice of tree species has been done with intended beneficiaries, growing the appropriate seedlings could then become a small-scale income generating activity for selected refugees or host families in the respective areas.
- Environmental sensitisation sessions for beneficiaries should include knowledge sharing of fuel-efficient stove designs, as well as guidance on improved cooking practices.
- Environmental considerations should be incorporated into the existing logistics and procurement checklists and database, as appropriate (see also Office Audit section).

### **3.7 BUDGET IMPLICATIONS**

As none of the recommendations involve major changes to the current programme, there are no specific budget implications.

### **3.8 TOOLS**

An environmental checklist which can be used and or adapted to suit other NRC shelter projects is attached in Annex V of this report.

### **3.9 REFERENCES AND RESOURCES**

IRC. 2007. Roofwater Harvesting – A Handbook for Practitioners.

Practical Action. 2007. Technical Brief: Rainwater Harvesting.

SKAT. 1998. Appropriate Building Materials.

UNEP/SKAT. 2007. After the Tsunami, Sustainable Building Guidelines.

[www.architectureforhumanity.org](http://www.architectureforhumanity.org)

## **4. NRC BURUNDI OFFICE AUDIT**

### **4.1 INTRODUCTION**

The third objective of this review was to investigate NRC's office and logistics procedures to ensure that they are conducted in a manner that minimises and possibly reduces the environmental impact.

Expected outputs of this objective are a list of key findings and recommendations including a standard checklist and cost-effectiveness of the actions.

### **4.2 Burundian Context**

The overall volume of household waste generated in Bujumbura is currently estimated at approximately 150,000m<sup>3</sup> per year and is expected to reach 210,000m<sup>3</sup> in 2015. Household waste disposal in Bujumbura is undertaken by SETEMU (Services Techniques Municipaux) which has a – theoretical – weekly waste pick-up service. However, this is usually hindered by the lack of resources, fuel and vehicle maintenance.

SETEMU collects approximately 20 per cent of Bujumbura's household waste. This is disposed of at Buterere public landfill on the outskirts of the town. Buterere landfill is not managed and has no lining, cells or disposal system.

Bujumbura has a number of small recycling businesses.

Outside of the capital, no centralised rubbish or wastewater disposal systems exist. Household waste is disposed of in pits outside houses and offices, and burned periodically.

### **4.3 NRC OFFICES**

NRC has four field offices in Muyinga, Makamba, Mwaro and Ruyigi, with its Head Office in Bujumbura.

Staff numbers are 271 country-wide including expatriates with 50 staff in Bujumbura. Field offices are located in Muyinga, Makamba, Mwaro and Ruyigi.

### **4.4 METHODOLOGY**

Two main techniques were used for data collection. These were:

**Meetings:** the Mission held meetings with key office and logistics staff in Bujumbura, Muyinga and Mwaro offices.

**Visits:** the team visited office premises and warehouses in all three locations. Although time was limited, major observations have been noted and recommendations for future improvements and a simple office checklist was compiled for future reference.

## **4.5 FINDINGS**

The following comments relate to the physical condition of NRC Bujumbura, Mwaro and Muyinga office compounds.

### **4.5.1 Office Infrastructure**

The NRC offices are made of concrete foundations, brick walls with a layer of concrete mix and iron sheeting roofs. They are spacious, light and well-ventilated. The car park is composed of mud and loose stones with no drainage facilities. It has no proper drainage system which makes the compound muddy on account of washing vehicles. Proper drainage channels should be constructed to improve this situation.

Both offices at Mwaro and Muyinga are smaller but are also generally light and well-ventilated.

### **4.5.2 Water**

Water in all three offices is provided by the Regideso town supply and consumption is metered. No leaks were evident in any of the offices. Water consumption is reasonable, with the notable exception of daily car washing in all three offices. In Bujumbura in particular, car washing is done using a running hosepipe leading to significant water consumption.

Water and electricity cuts occasionally occur in the Mwaro but are not considered to be a major issue by office staff.

In Muyinga, water and electricity supply is less reliable. During lengthy water shortages in Muyinga, the logistics assistant and a driver make several return trips in a pick-up truck to the nearest spring, approximately 2km away.

### **4.5.3 Energy**

The NRC Bujumbura office is connected to the Regideso electricity supply system which has not been reported to have any major problems. Electricity consumption is monitored using a prepaid card. A standby generator switches on automatically should there be a power cut of more than several minutes. The generator is not reported to make an excessive amount of noise and fuel consumption is monitored with a log book.

Each of the other offices has a standby generator for use during power cuts. Whilst the generators are not located in a sound-proof building, they are said not to be invasive. The generator in the Bujumbura office features an automatic cut-in/off mechanism, while field office generators are activated manually, when required.

It is recommended that bund walls be constructed in order to contain any fuel spillages.

The Mission noted that the external security lights were on during daylight hours on one occasion. This could easily be corrected by connecting to an automatic switch.

#### **4.5.4 Kitchen and Catering**

Staff lunchtime meals are prepared in the kitchen and consumed outside.

#### **4.5.5 Suppliers and Purchasing of Equipment, Materials and Products**

Most purchases are made locally and packaging is minimal. The logistics department has a suppliers and contractors database, which follows up on supplier and contractor performance. This database was in the process of finalisation during the mission.

#### **4.5.6 Disposal, Recycling and Storage of Equipment, Materials and Products**

NRC already makes a considerable effort to recycle all possible materials. This includes used plastic sheeting, iron sheets and tyres.

No waste containers were evident in the compounds. In Bujumbura, waste food was simply dumped in the corner of the compound. Provisions and containers for the safe storage of office waste – even used and cleaned oil drums – should be installed.

Different types of waste such as paper, cardboard and glass are separated in the Bujumbura office. However, it is suspected that the current waste collection and disposal service mixes them again and dumps them in Buterere's public landfill.

Hazardous items such as used oil filters and spare parts for motorbikes and vehicles are sent back to the Bujumbura office to the local garage used by NRC.

As of January 2008, printer ink cartridges and computer parts are being sent to the Bujumbura office from Mwaro and Muyinga. An ink cartridge recycling company has already been identified by NRC Bujumbura office staff but an agreement has not yet been reached.

Paper and cardboard in Mwaro and Muyinga is burnt in the compounds.

#### **4.5.7 Transport**

Saloon cars are used for town activities. All vehicles are strictly maintained, and logbooks recording mileage are used. Vehicles are serviced in Bujumbura when required.

Travel between Mwaro and Bujumbura is rationalised as follows: travel is only permitted three days per week, and vehicles meet half-way between in order to reduce DSA costs for drivers and ensure that the field vehicles are available for field use at all times.

## 4.6 CONCLUSIONS

NRC Burundi already has a very high environmental awareness and makes informed choices on all environment-related aspects of office and logistics management thanks to the system put in place by the current logistics country coordinator.

Some additional recommendations are listed below.

## 4.7 RECOMMENDATIONS

- NRC should elect a country environmental focal point as planned. This should be a voluntary position based in Bujumbura. The country focal point should be trained and made available for advice to field offices on the points listed below.
- Environmental focal point to test, use and adapt attached office checklist.
- Include simple environmental indicators in new supplier database. For example: does the supplier select source materials in an environmentally responsible manner causing minimum negative impact? Does the supplier deal with waste in an appropriate and responsible manner?
- Environmental focal point to coordinate with Shelter specialists on ways to install rainwater collection and storage systems in Mwaro and Muyinga.
- Drainage channels should be constructed for the car park in Bujumbura.
- The environmental focal point should investigate ways to reduce the use of water (gardening, watering, car washing).
- The external security lighting should be connected to an automatic switch to void the lights being left on during daylight.
- No particular comment on energy resources. Environmental focal point could investigate bulb use and type.
- Further investigate disposal of kitchen and food waste.
- General warehouse good practice should be followed according to the recommendations of the logistics manager:
  - All materials should be stored away from walls and off the ground to avoid unnecessary and premature degradation and wastage of materials
  - Old stock that is no longer to be used should be sold locally or given to beneficiaries that perceive a use for them
  - Expired chemicals should ideally be disposed of at appropriate hazardous waste facilities. The environmental focal point should investigate existing hazardous waste facilities in Bujumbura. If such facilities are unavailable, the focal point should seek advice on the most appropriate and realistic disposal method available.

- Used oil filters should be drained of used oil before disposal to landfill. If they are not drained, the entire filter should be disposed of as hazardous waste. The environmental focal point should check the procedure employed by the garage used for vehicle maintenance.
- A thorough inventory of materials should be made and all stores should be clearly labelled to ensure that materials such as chemicals are used or sold before their expiry date, thus reducing wastage.
- NRC should continue with the existing system of identifying potential uses for all office, project and vehicle waste.
- Environmental focal point to pursue discussions with Bujumbura recycling companies to find most cost-effective and environmentally-friendly solution for waste disposal in Bujumbura.
- Include simple environmental indicators – for example the environmental considerations of recycling or disposal, or the environmental implications of procurement – in the new supplier database to help ensure a more systematic checking.

#### **4.8 BUDGET IMPLICATIONS**

Due to time constraints, budget implications were not fully investigated. It is recommended that the environmental focal point – if appointed – contacts local recycling companies to assess potential additional costs.

#### **4.9 TOOLS**

A suggested office environmental audit checklist is attached as Annex VI to this report, intended as a starting point for modification and expansion by the environmental focal point, if appointed.

**ProAct recommends that NRC continues to exercise the activities it is currently supporting, and re-inforces this by appointing a country Environmental Focal Point, or a Burundi “Green Team”, with volunteer staff from each of its offices.**

#### **4.10 REFERENCES AND RESOURCES**

“Greening the Office – Online Audit”

[www.green-office.org.uk/audit.php](http://www.green-office.org.uk/audit.php)

Simple example of office audit general questions.

WELL FactSheet: Waste Disposal in Developing Countries

[www.lboro.ac.uk/well/resources/fact-sheets/fact-sheets-htm/waste.htm](http://www.lboro.ac.uk/well/resources/fact-sheets/fact-sheets-htm/waste.htm)

## **5. SUGGESTED NEXT STEPS**

The following outline is presented as a guide to implementing the main recommendations mentioned above.

### **Step 1: Training Needs Assessment and Tailored Training for NRC Staff**

It is clear that despite significant advance made by NRC in minimising its operation's impacts on the environment there are certain areas where further improvements could be made. This is especially true in the instance of domestic energy. The following activities are seen as fundamental steps towards improving the current situation.

- Conduct rapid environmental assessments at all sites using available assessment tools.
- Introduce the process of CEAPs to local authorities and communities (host, refugee, returnee) and if sufficient interest is shown, start the process of CEAP training, and development, with a view to developing and implementing (if funding allows) action plans as part of camp management in 2009.
- Develop information, education, communication materials and approaches.
- Conduct Knowledge, Attitude and Practices (KAP) studies.
- Conduct firewood use and needs studies at the community and household levels. NRC staff should be trained in modalities required for conducting such analyses at regular intervals.
- Conduct independent stove efficiency tests.

In addition to the above, identify other areas where NRC feels that there is a need to build local capacity to undertake these activities and/or where it might partner external organisations to do so.

### **Step 2: Forestry Resource Management**

The forestry issue in Burundi will never be resolved unless a broader picture is looked at, outside of the camp context. In this regard, it is recommended that NRC and UNHCR engage closely with relevant government authorities, specialist environmental agencies already working in the country (e.g. IUCN-International Union for the Conservation of Nature) to develop management plans for specific plantations where wood can be harvested sustainably for provision to camps.

Key to developing such management plans will be in the inclusion and empowerment of local communities, land-owners, farmers and woodlot owners. A participatory approach to developing and managing such plans is strongly advocated.

### **Step 3: Firewood Use/Management**

Activities undertaken through Step 1 above will already provide some essential information into addressing the issue of firewood provision, distribution and management. Key to this is an initial assessment of the actual energy needs of each camp, at which stage more realistic and appropriate quantities of wood might be

acquired. This is then also the time to introduce a well planned, focused and supported programme of distribution of fuel-efficient stoves.

A few additional, but related actions include:

- awareness raising campaigns to get people to dry wood and prepare it properly for stoves;
- constructing camp storage facilities;
- promoting good cooking practices; and
- monitoring and evaluation of progress.

#### **Step 4: Conservation Measures**

Few refugee or IDP camps limit the extent of their ecological footprint to the physical boundaries of the camps themselves, and this is certainly the case in Burundi, with wood being sourced from outside the camp areas. Other materials too may be sourced elsewhere, such as clay, poles for construction or thatching. It is important that some level of preparation is now given to addressing such impacts, also with a view to eventual camp closure, when significant environmental rehabilitation might be required. (Guidance on this issue can be found in the – draft – *Guideline on Camp Closure* being prepared by the Camp Co-ordination and Camp Management Cluster.)

Some practical activities that could usefully be undertaken in support of broader conservation measures include:

- develop information, education and communication (IEC) materials for awareness-raising, for refugees and host communities;
- develop a mechanism to limit the production of charcoal, e.g. alternative IGAs;
- promote water conservation activities in institutional and urban/peri-urban settlements;
- promote and support local events that support environmental management; and
- promote the use of fuel-efficient stoves.

## **ANNEXES**

<b>Annex I</b>	<b>Cooking Knowledge, Attitude and Practices Assessment Tool</b>
<b>Annex II</b>	<b>Stove Efficiency Assessment Tool</b>
<b>Annex III</b>	<b>Charcoal Production Assessment Tool</b>
<b>Annex IV</b>	<b>Wood Consumption Tool</b>
<b>Annex V</b>	<b>Shelter Environmental Checklist</b>
<b>Annex VI</b>	<b>Office Audit Checklist</b>
<b>Annex VII</b>	<b>Mission Itinerary</b>

## **ANNEX I COOKING KNOWLEDGE, ATTITUDE AND PRACTICES ASSESSMENT TOOL**

### **Introduction**

This assessment consists of direct observation (part 1) and interview questions (part 2). The data collected by using this instrument will provide NRC with key information relating to the existing levels of refugee knowledge, their attitudes and practices in relation to fuel and cooking practices. It will provide the basis of fuel-related activities, including awareness-raising, training needs and feed into income generation activity development.

### **Numbers interviewed and duration of the assessment**

Ideally, data from at least 50 households should be collected. It is likely that 5-8 assessments will be completed in one day. The assessment is therefore likely to take 9-10 days for data collection, and a further 3-4 days for analysis and report writing.

### **Instructions to data collector**

1. Ask the female head of the household for permission to enter the family shelter area and ask some questions relating to cooking.
2. Explain the rationale for the assessment.
3. Reassure the female head of the household that the questions are not an interrogation, but merely a means of getting a better idea on what, and how fuels are used.
4. Ensure that all components of this tool are completed.
5. Each family assessed should be assigned a unique reference number.
6. Feel free to add any additional observations at the end of the tool.

<b>Name of data collector</b>	
<b>Name of camp</b>	
<b>Date</b>	
<b>Name of family shelter visited</b>	
<b>Precise location / house number of shelter visited</b>	
<b>Reference number</b>	

### Part 1 - Direct observation

<b>1. Where does cooking take place?</b>	Tick
Inside family shelter	
Outside family shelter	
In a cooking shelter	

*[Tick one box only]*

<b>2. What types of stove(s) exist in the cooking area?</b>	Tick
Traditional 3 stone fire	
Clay fuel-efficient stove	
Charcoal brazier	

*[Tick relevant boxes]*

<b>3. Is the wood ration protected from rain?</b>	Tick
Yes	
No	

*[Tick one box only]*

<b>4. Is cooking in progress?</b>	Tick
Yes	
No	

*[Tick one box only]*

*If yes, go continue to question 5. If no, go to question 8.*

<b>5. What type of stove is / are being used?</b>	Tick
Traditional 3 stone fire	
Clay fuel-efficient stove	
Charcoal brazier	

*[Tick relevant boxes]*

<b>6. What type of fuel is / are being used?</b>	Tick
Wood	
Charcoal	
Other (specify)	

*[Tick relevant boxes]*

*If wood is being used, continue to question 7. If other sources of fuel are being used, go to question 8.*

<b>7. Has the wood been split before use?</b>	Tick
Yes	
No	

*[Tick one box only]*

<b>8. What fuel-efficient cooking practices can you observe?</b>	Tick
Use of lids	
Simmering, rather than rapid boiling	
Double cooking	
Others (list)	

*[Tick relevant boxes]*

<b>9. Has additional thermal insulation been added to the family shelter?</b>	
Yes	
No	

*[Tick one box only]*

### Part 2 – Interview

<b>10. Do you supplement your fuel ration?</b>	Tick
Yes	
No	

*[Tick one box only]*

*If yes, continue to question 10. If not, then go to question 11.*

<b>11. How do you supplement your fuel ration?</b>	Tick
Buy wood	
Buy or make charcoal	
Collect wood outside the camp	

*[Tick relevant boxes]*

<b>12. List the fuel-efficient cooking practices that you know</b>	Tick
Use lids	
Add bicarbonate of soda when cooking beans	
Do not add salt during cooking beans	
Double cooking	
Simmering rather than rapid boiling	
Extinguish fire immediately after cooking	
Bulk cooking	
Cutting food into small pieces	
Pre-soaking hard, dried foods	
Tenderising before cooking	
Weighing down lids (to create a pressure cooker effect)	
Shared cooking (between families)	
Others (list)	

*[Tick each practice mentioned]*

<b>13. Which fuels do you prefer to use for each of the following?</b>	<b>Wood or charcoal</b>
Heating the family shelter	
Boiling water	
Cooking maize meal (ugali)	
Cooking beans	
Cooking rice	
Cooking peas	
Cooking vegetables	
Other (list if mentioned)	

*[Record either “wood” or “charcoal” for each activity]*

<b>14. Do you grow your own vegetables?</b>	<b>Tick</b>
Yes	
No	

*[Tick one box only]*

<b>15. Are you involved in any income generating activities?</b>	<b>Tick</b>
Yes	
No	

*[Tick one box only]*

**SPACE FOR ADDITIONAL REMARKS**

## **ANNEX II COMPARITIVE STOVE EFFICIENCY ASSESSMENT TOOL**

### **Introduction**

This tool provides guidance on the measuring the fuel-efficiency of different fuel-efficient stoves. Since wood is supplied to the refugee camps, the tests will use wood as the source of fuel.

The results of these assessments should provide data that will assist NRC in identifying the most appropriate fuel-efficient stoves in the future.

### **Assessment procedure**

1. Weigh the quantity of wood (more than will be needed for the test)
2. Use a new pot (with lid) – the same as those distributed to the refugees, as part of their NFI
3. Fill the pot with a known volume of water (make sure that the amount is at least two thirds the volume of the pan)
4. Record the temperature of the water

### **High power phase:**

1. Start the fire at high power, to bring the water in the pot to a boil
2. Note the time and temperature
3. Remove all wood from the stove, knock off any charcoal and weigh it together with the unused wood.

### **Low power phase:**

1. Return the pot to the stove
2. Continue the assessment at low power, so that the temperature of the water stays within 2 degrees of boiling
3. Continue for 30 minutes, using the least amount of wood possible
4. Weigh and record the amount of wood remaining after 30 minutes

This assessment can be compared against a traditional 3 stone fire (using exactly the same procedure) in order to provide a benchmark for the calculation of percentage efficiency of the stoves tested.

## ANNEX III CHARCOAL PRODUCTION ASSESSMENT TOOL

### Introduction

Refugees make charcoal at all the camps managed by NRC. An assessment of charcoal production will assist NRC in better understanding the motivations for its production, the sources of wood used and guide the development of a charcoal production control / management strategy.

### How and when to use this tool

It is suggested that refugees physically in the process of making charcoal are interviewed.

### Instructions for data collectors

1. Explain the rationale for collecting the data
2. Complete all sections of the interview questionnaire
3. Note that the name of the charcoal maker is not recorded

Name of interviewer	
Name of camp	
Date	

### Observation section

<b>1. Physical location of charcoal production</b>	Tick
Next to wood storage area	
Next to family shelter	
At the boundary of the camp	

*[tick one box only]*

### Interview section

<b>2. Where do you get the wood to make charcoal?</b>	Tick
Part of wood ration	
Buy the wood	
Harvest wood from outside the camp boundary	

*[tick relevant boxes]*

<b>3. What do you do with the charcoal that you produce?</b>	Tick
Use it for personal consumption	
Sell it to other refugees	
Sell it to local community members	

*[tick relevant boxes]*

*If charcoal is sold to both refugees and local community members, continue to question 4. If not, go to question 6.*

<b>4. Approximately, what percentage do you sell to refugees / local community members?</b>	Record in %
Percentage sold to other refugees	
Percentage sold to local community members	

*[record both percentages]*

<b>5. Approximately, how much profit <u>per week</u> do you make from selling charcoal?</b>	
---	--

*[record figure]*

<b>6. How many sacks of charcoal do you make in one week?</b>	
---	--

*[record number of sacks]*

<b>7. What is charcoal most commonly used for?</b>	Tick
Heating of family shelters	
Grilling meat	
Boiling water	
Making hot drinks	
Cooking maize meal	
Cooking beans	
Cooking peas	
Cooking rice	
Cooking vegetables	

*[tick relevant boxes]*

<b>8. Does anyone control the making of charcoal?</b>	Tick
Nobody controls the making of charcoal	
Decided between the refugees	

*[tick only one box]*

## **ANNEX IV WOOD CONSUMPTION TOOL**

### **Objective:**

This tool is intended to provide information on which NRC is able to re-calculate firewood supply needs. It takes into account not only wood consumption, but will also provide data regarding wood use practices.

### **Resources needed:**

At least 2 staff to conduct the assessment (for at least 7 days)

Weighing scales

Plastic sheet (to hold the wood to be weighed)

At least 15 participating refugee families

### **Before the assessment is conducted:**

The assessment team should hold a meeting with refugee leaders in order to explain the rationale behind the study.

Refugee leaders should assist in the identification of families willing to participate in the assessment.

Participant briefing: A meeting with the participating families should be held in order to explain the rationale for the assessment and also what is expected from each family. This should include:

- Emphasising that participating families should not supplement their firewood supply for the duration of the assessment
- The importance of providing honest responses
- Ensuring that participants will not be judged on the results of the assessment – merely that the assessment is intended to give an overall impression of firewood consumption for the whole camp.

### **When to conduct the assessment:**

Ideally, the assessment should be conducted half-way through the firewood ration distribution cycle (i.e. 2 weeks after wood has been distributed). The results should reflect average wood consumption rates throughout the month.

### **Conducting the assessment:**

The main activity of the assessment is the calculation of firewood consumption on a daily basis (preferably at the same time, each day). This is achieved by weighing the amount of wood that each family has at the beginning of the assessment. The subsequent, remaining wood ration should be weighed every day, for a period of 7 days.

The daily weighing activity will be complemented by a short interview, asking each family what food stuffs were cooked the previous day, and the amount (e.g. for daily

needs, or bulk cooking) and approximately how much water is boiled each day. Additionally, how long fires are kept burning, as a source of heat each night.

**Completing the assessment form:**

All information on the following form must be completed.

**Wood consumption assessment tool**

<b>Camp</b>	
<b>Names of assessors</b>	
<b>Name of family</b>	
<b>Number of people in household</b>	
<b>Location &amp; number of family shelter</b>	
<b>Dates of assessment</b>	/ / 09 to / / 09
<b>General Weather conditions (temperature / rain)</b>	
<b>Season</b>	

**A. Direct observations at the family shelter**

1. Is wood stored in a manner that protects it from rain?

*Tick the appropriate box*

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

2. Is there evidence of wood being split before cooking?

*Tick the appropriate box*

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

3. Does the family have a fuel-efficient stove?

*Tick the appropriate box*

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

4. Does the family have a charcoal brazier?

*Tick the appropriate box*

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

--	--

**B. Initial family interview (to be conducted with the mother)**

5. What types of cooking fuels does the family normally use?

*Tick the appropriate box(es)*

Wood	Charcoal

6. Which type of fuel is preferred for each food type / activity, and why?

Food type	Preferred fuel		Reason for preference
	Wood	Charcoal	
Beans			
Maize flour			
Peas			
Rice			
Heating shelter			
Other (list)			

7. Is firewood used by the family to heat water and / or heat the family shelter?

*Tick appropriate boxes*

Activity	Yes	No
Heat water?		
Heat shelter?		

8. If firewood is used for heating the family shelter, approximately how long is the shelter heated for each night?

Number of hours	
-----------------	--

### C. Firewood consumption recordings

It is important to remember that the questions below refer to cooking activities undertaken the **previous day**.

These recordings should be taken in the morning time and at the same time each day, since the recordings should reflect the amount of wood used on a daily basis (i.e. every 24 hours).

Step 1: Initial weight of wood supply (kgs)

Step 2: Begin making subsequent recordings 24hours (i.e. "Day 1) after recording the initial weight of wood.

Day	Weight of wood recorded <u>today</u>	Amount of wood used	Amount cooked <u>yesterday</u> (daily or bulk)	Type of food cooked <u>yesterday</u> (list)
1				
2				
3				
4				
5				
6				
7				
8				

NB: With the exception of the recording the weight of wood (first column), the information collected each day should be recorded in the row of the previous day (i.e. information collected on day 2 should be recorded in the row for day 1, since you are asking what was cooked the previous day).

## ANNEX V SHELTER ENVIRONMENTAL CHECKLIST

### Introduction

Shelter projects use local and imported materials. The choice of materials together with other factors can have an impact on the local environment. This simple checklist aims to serve as a reminder of key points to consider when setting up or following a small scale shelter project.

### How and when to use this tool

This tool can be used at the planning stage of any rural shelter project, or at any subsequent stage of the construction process during site visits. This particular tool has been designed specifically for the Burundian context and should be adapted to suit local needs.

General	Key Considerations	Answer / Tick
Site	Is it a sensitive site?	
	How was it selected?	
Ventilation	Is the building adequately ventilated?	
Lighting	Is the building adequately lighted?	
Drainage	Has drainage been considered in the design?	
	Will it cause local erosion?	
Water	Where is the nearest water supply?	
	Is it sufficient?	
Waste	What happens to waste building materials?	

Material	Key Considerations	Answer / Tick
Adobe bricks	Where does the mud come from?	
	How are the bricks produced?	
	Is it legal?	
	Does it impact the local landscape?	
	Has the topsoil been used or returned?	
	Have the excavation pits been secured?	
	Are they adequately protected from moisture?	
	Have alternatives been considered?	
Burnt bricks	Who provides them?	
	Where does the clay come from?	
	How are they transported?	
	How are they burnt?	
	What technique is used and is it efficient?	
	What fuel is used?	
	Does the fuel come from legal and sustainable sources?	
	Do they correspond to local building techniques?	
	Can the technique be improved or can alternative suppliers be found?	

	Have alternatives been considered?	
Stones	Where do they come from?	
	How are they transported?	
	Are they from a legal source?	
Cement	Where does it come from?	
	How is it transported?	
	Is it the best available quality?	
Timber	What type of wood is used?	
	Is it the most appropriate type?	
	Where does it come from?	
	How is it transported?	
	Can the supplier provide certificates?	
	Has it been treated?	
	Can the design be altered to safely and effectively reduce quantities used?	
	Does it correspond to local techniques?	
Roofing Tiles	Who provides them?	
	Where does the clay come from?	
	How are they transported?	
	How are they burnt?	
	What technique is used and is it efficient?	
	What fuel is used?	
	Does the fuel come from legal or sustainable sources?	
	Do they correspond to local building techniques?	
	Can the technique be improved or can alternative suppliers be found?	
Nails	Where do they come from?	
	How are they transported?	
	Are they the best available quality?	
Other	Where does it come from?	
	How is it transported?	
	Is it legal?	
	Is it the best available option?	

## ANNEX VI OFFICE ENVIRONMENTAL CHECKLIST

### Introduction

Office practices including procurement, day to day use of energy and resources, logistics and waste disposal have an impact on the local environment. This simple checklist aims to serve as a reminder of key environmental points to consider to help reduce the impact on the local environment.

### How and when to use this tool

This tool can be used at regular intervals to assess offices practices. It should be tested and adapted by an appointed environmental focal point.

Area	Key Considerations	Answer / Tick
Staff	Number of office staff	
	Is the staff environmentally aware	
	Is there an environmental focal point	
Buildings	Construction type and technique	
	Car park	
	Garden	
Ventilation	Are the offices well ventilated	
Drainage	Are the drainage facilities adequate	
Lighting	Are the offices adequately lit-up	
	What types of light bulbs are used. Are they energy efficient	
	How are offices lit at night. Could lighting be reduced without negatively impacting on security	
Energy	What is the main source of energy	
	What are the main uses of energy	
	How is generator use managed	
	Is electricity / fuel use monitored	
	Can any measures be taken to reduce energy use?	
Water	What are the main sources of water	
	What are the main uses of water	
	Is water consumption monitored	
	Can measures be taken to reduce water use	
	Is rainwater harvesting appropriate	
Waste	What different types of waste are produced in the office	
	How is it separated	
	How is it stored (per type of waste)	
	How is it disposed of (landfill, burning, other)	
	Where does it go	
	What alternatives exist (recycling, reuse)	
	Can measures be taken to reduce office waste	

	generation	
Transport	What are the main types of transport used	
	Are distances, use and fuel consumption monitored	
	Are vehicle maintenance records kept	
	Can vehicle use and fuel consumption be rationalised without negatively impacting on operations and security	
Material procurement	Is there a formal procurement system	
	Are environmental indicators part of the system	
	Is the source of materials known and does the supplier select it in an environmentally responsible manner	
	Does the supplier deal with waste in an environmentally responsible manner	
	Can the packaging be reduced or reused	
Suggestions	What improvements can be made to current system	

Planning de la mission de consultation sur l'environnement  
Burundi du 27 octobre au 8 novembre 2008

Lundi 27 octobre		
8h30	Arrivée Aéroport Bujumbura	Voiture de location vient les accueillir
13h30 - 14h00	Briefing sécurité	Jean Paul, assistant sécu CNR
14h00 - 16h00	Rencontre avec CNR	Prg Shelter et CM (Stéphane et Philippe)
16h30	PARESI	A confirmer le RDV et le lieu
Mardi 28 octobre (journée sans déjeuner☺)		
8h30 - 9h45	ACVE : ONG environnement (état des lieux environnement au BDI)	Au bureau ACVE (Novotel)
10h00 - 11h30	Réunion ABO (cuiseur solaire)	Bureau ABO avenue de la mission
12h00 - 16h00	Mageyo (haut et bas)	Visite 2 écoles (semi-permanente et temporaire)
16h30 - 17h30	Metha Pritesh (fournisseur matériaux de construction)	Boutique Metha
Mercredi 29 octobre		
8h15 - 9h00	CNR Finance Logistic Administration Manager	Bureau CNR
9h30 - 11h00	Ministère de l'environnement (Hermenegilde Ntitanguranwa)	Ancien bureau Ministère derrière Cathédrale
11h00 - 12h00	Sania Shop (recyclage encre photocop)	A Sania shop
12h00 - 14h00	Pause déjeuner	
17h00 - 18h30	UNHCR (CM et shelter) Fanou et Lucia	Bureau HCR
Jeudi 30 octobre		

8h00 - 10h00	Bricoop (fabrication + réunion)	Bureau CNR puis visite usine
A partir de 10h00	Déplacement vers Mwaro	
12h00 - 14h00	Pause - déjeuner	
14h 00- 14 h 30	Entretien avec le Gouverneur de Province Mwaro et l'Administrateur de Kayokwe	Bureau de la province Mwaro
14 h 30- 15 h 00	Déplacement vers Gisozi	
15 h 00- 15 h 30	Entretien avec le DPAE Mwaro	Lieu : DPAE à Gisozi
15 h 30- 16 h 00	Entretien avec le Chargé des forêts- Projet Mugamba & Bututisi et l'Inspecteur Provincial des forêts	Lieu : Gisozi
<b>Vendredi 31 octobre</b>		
9h 00- 9 h 15	Départ vers le camp de Gihinga	
9h 30 - 10 h 30	Focus group- Femmes réfugiés	Gihinga
10 h 30- 11 h30	Focus group- Hommes réfugiés	Gihinga
11 h 30 - 12 h 30	Entretien avec les Fournisseurs de bois dans le camp de réfugiés	Gihinga
12 h 30- 13 h 45	Pause-Déjeuner	
14 h 00- 15 h 00	Fous group- Fabricants du camp et vendeurs de charbon dans le camp + Chefs des collines Ruvumu et Gihinga	Gihinga
15 h00- 16h 00	Entretien avec le staff ciblé du CNR	Bureau CNR
<b>Samedi 1<sup>er</sup> novembre</b>		

A partir de 9h00	Retour à Bujumbura	
<b>Dimanche 2 novembre</b>		
	Repos	
<b>Lundi 3 novembre</b>		
??	Visite Bureau Projet Education	
15h00 ??	Didace Nzikoruriho (ONPRA)	Au CNR
13h00 (au plus tard)	Départ Bujumbura	
17h00 (au plus tard)	Arrivée à Muyinga	
<b>Mardi 4 novembre</b>		
8h00 - 9h00	DPAE Muyinga	
9h00	Journée de terrain Shelter	Giterany (habitat - école permanente)
16h00	Retour à la base de Muyinga	
16h15 - 17h15	Pétronie et Paula (audit office Muyinga)	CNR Muyinga
<b>Mercredi 5 novembre</b>		
9h00	Départ pour Musasa	3h30 dans le camp de Musasa (Shelter et CM)
13h15	Départ pour Gasorwe	2 heures dans le camp Gasorwe (CM)
15h45	Départ pour Muyinga	
16h00	retour à Muyinga	
<b>Jeudi 6 novembre</b>		
9h00	Départ pour Bujumbura	
10h30 -	Fournisseur foyer amélioré	Atelier de Claude TWEGAMIYABAHIZI
	Arrivée à Bujumbura	
<b>Vendredi 7 novembre</b>		
14h00	Débriefing de la mission auprès du CNR Burundi	Bureau CNR
<b>Samedi 8 novembre</b>		

7h00	Départ pour Aéroport	
9h20	Départ de l'avion	