



Food and Agriculture
Organization of the
United Nations

Building resilience through Safe Access to Fuel and Energy (SAFE)

Moving towards a comprehensive SAFE Framework



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Contents

Foreword.....	v
Acknowledgements	vi
Acronyms	vii
Introduction	1
The evolution of FAO's role in addressing energy in emergencies	2
FAO's approach	3
SAFE and FAO's mandate	4
Holistic perspective.....	6
The multisectoral nature of energy access	6
Underlying principles	15
Framework.....	22
Objectives	22
Framework	36
Tools and methodologies in the field.....	39
SAFE assessments	39
SAFE programmes and projects	41
Practical tools	43
Mainstreaming SAFE in national policies	45
Conclusion	46
REFERENCES	47



Transporting charcoal around the Kakuma camp, Rift Valley, Kenya. A man carries charcoal on the back of his bicycle.

Foreword

Natural disasters and conflicts disrupt livelihoods, threaten food security and are responsible for millions of forcibly displaced people. The number of conflicts is on the rise and, exacerbated by climate related shocks, are a cause of much of the recent deterioration of the global food security situation. Conflict is a key driver of situations of severe food crisis and increases the risk of famines, while hunger and undernutrition are significantly worse where conflicts are prolonged and institutional capacities weak. Furthermore, the number of climate-induced disasters has increased significantly over the last decade with floods, droughts and tropical storms having the most severe impact on the agricultural sectors. More than 80 percent of the loss and damage caused by drought affects the agriculture sectors, in particular livestock and crop production.

The Food and Agriculture Organization of the United Nations (FAO) is working with its partners to address these challenges by building the resilience of livelihoods to threats and crises. Through its Strategic Programme on Resilience, FAO is promoting the use of integrated approaches and conflict sensitive programming to address the threats posed by conflict, climate shocks and natural resource degradation. The Safe Access to Fuel and Energy (SAFE) approach is a pertinent example. FAO has been promoting SAFE in forced displacement contexts in order to assess risks and design comprehensive interventions that can respond effectively to the fuel and energy needs of affected populations while taking into account the sustainable management of natural resources. The approach harnesses expertise from a range of technical areas related to FAO's core mandate and helps to fill the gap caused by years of overlooking the crucial importance of the energy sector in the response to acute emergencies and protracted crises.

This report presents an overview of FAO's work on SAFE and the steps needed to scale up the approach. FAO remains fully committed to support efforts that improve access to energy for vulnerable populations so that they can cook their food, heat their homes and power their communities in a safe and sustainable way.

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Acronyms

AAP	Accountability to Affected Populations
CFS	Committee on World Food Security
COP 21	21 st session of the Conference of the Parties to the United Nations Framework Convention on Climate Change
DRR	Disaster risk reduction
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus group discussion
FFA-CFS	Framework for Action for food security and nutrition in protracted crises of the Committee on world Food Security
GACC	Global Alliance for Clean Cookstoves
GBV	Gender-based violence
GHG	Greenhouse gas
IASC	Inter-Agency Standing Committee
IDP	Internally displaced person
IFES	Integrated Food and Energy Systems
INDC	Intended Nationally Determined Contribution
IP	Implementing partner
LPG	Liquefied petroleum gas
NDC	Nationally Determined Contribution
NGO	Non-governmental Organization
ODI	Overseas Development Institute
PRA	Participatory rural appraisal
SAFE	Safe Access to Fuel and Energy
SE4All	Sustainable Energy 4 All

SDGs	Sustainable Development Goals
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commissioner for Refugees
UNPBSO	United Nations Peacebuilding Support Office
UN-REDD	United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation
UNTFHS	United Nations Trust Fund for Human Security
WB	World Bank
WFP	World Food Programme
WHO	World Health Organization
WWAP	World Water Assessment Programme

Introduction

The influx of displaced people and their cooking fuel needs can often exert great pressure on forests and woodlands

Globally, nearly 3 billion people rely on traditional biomass, such as fuelwood, charcoal or animal waste, as sources of fuel for cooking and heating. In Sub-Saharan Africa more than 80 percent of the population cook their meals using traditional biomass; by 2030, it is anticipated that 1 billion people in Africa will depend on traditional biomass to meet their energy needs. Vulnerable populations – including refugees, Internally Displaced Persons (IDPs) and the communities hosting them – often have very limited access to cooking fuel and other forms of energy. Thus, despite the particularly challenging conditions faced by displaced populations, the energy needs of refugees and IDPs are not considered explicitly in either the Sustainable Energy 4 All (SE4All) or the Sustainable Development Goals (SDGs).

Refugee and IDP camps are often established in fragile, sparsely forested ecosystems in which both host and displaced populations depend on the scarce natural resources found in areas surrounding the camps. The influx of displaced people and their cooking fuel needs can often exert great pressure on forests and woodlands. This is frequently a source of tension between host and displaced communities, which increases the risk of women and children being harassed and assaulted while searching for fuelwood. Furthermore, collecting fuelwood takes time away from school attendance, income-generating activities, childcare and leisure and can reduce the effectiveness of other humanitarian and development programmes targeting women and children. The lack of sufficient cooking fuel also has an impact on the nutrition and health of vulnerable households since women may resort to undercooking food or skipping meals to save fuel as well as bartering food for fuel. In displacement contexts, cooking is often carried out using a three stone fire in poorly ventilated spaces which exposes women and children to respiratory illnesses. Both host and refugee populations rely on short-term and unsustainable livelihood activities such as charcoal production and selling of fuelwood.

The average time spent as a refugee is currently 17 years (Lahn & Grafham 2015). Hence, there is a need to incorporate energy access in both rapid humanitarian response planning as well as in longer-term resilience-building interventions. Sustainable and appropriate solutions, which take into account both short-term and long-term objectives, are needed.



FAO Myanmar staff carrying out focus group discussions in Nget Chaung IDP Camp, Pauktaw Township, Myanmar.

The evolution of FAO's role in addressing energy in emergencies

The Food and Agriculture Organization of the United Nations (FAO) has a long history in implementing energy-related projects and programmes. In the 1980s and 1990s, FAO emphasized the need to ensure energy access to vulnerable populations, and implemented activities such as increasing the supply of woodfuel, improving charcoal conversion efficiency, providing access to fuel-efficient stoves and supporting the sustainable management of natural resources in areas with scarce woodfuel resources. Between 1983 and 1994, FAO was an implementing agency in the large-scale programme 'Fuelwoods Development for Energy in Sudan'. Later on, FAO became involved in the Safe Access to Fuel and Energy initiative, initially through the Inter-Agency Standing Committee (IASC) Task Force on Safe Access to Firewood and alternative Energy in Humanitarian Settings (IASC Task Force on SAFE). The Task Force was established in March 2007 'to reduce exposure to violence, contribute to the protection of and ease the burden on those populations collecting wood in humanitarian settings worldwide, through solutions which will promote safe access to appropriate energy and reduce environmental impacts while ensuring accountability' (WFP 2012). The World Food Programme (WFP), the Women's Refugee Commission and the United Nations Refugee Agency (UNHCR) co-chaired the Task Force, which consisted of 14 other IASC members and non-member agencies. The SAFE initiative has since then changed its name to Safe Access to Fuel and Energy to reflect the expansion of the initiative to include the use of energy for purposes other than cooking. It is coordinated through the SAFE Humanitarian Working Group, of which FAO is currently co-chair, and the associated SAFE Steering Committee, of which FAO is an active member.

Under the IASC SAFE Task Force, two central tools were developed:

- A Decision Tree Diagram on Factors Affecting the Choice of Fuel Strategy in Humanitarian Settings, to help determine which cooking fuel options will be most appropriate in diverse response settings (IASC 2009a).
- A Matrix on Agency Roles and Responsibilities for ensuring a Coordinated, Multi-Sectoral Fuel Response in Humanitarian Settings, to reduce overlaps and duplication of efforts in responding to energy needs (IASC 2009b).

As outlined in the IASC Matrix on Agency Roles and Responsibilities, FAO has committed to take the lead in carrying out activities in the Environment, Natural Resources Management, Livelihoods and Food Security sectors. While FAO continues to play a lead role in these areas, the Organization is broadening its focus areas in line with other actors.

FAO's SAFE approach is particularly adaptable to regions and countries facing protracted crises

FAO's approach

FAO is working to respond to the energy needs in emergencies and protracted crises, particularly in the context of forced displacement, migration and climate change. Access to energy, which is vital for food security, is often highly constrained in emergencies and protracted crises. Lack of access to energy can expose people to a number of risks and challenges, including malnutrition, increased vulnerability to natural hazards and the impacts of climate change and environmental degradation. Energy needs is key factor in the perpetuation of a disproportionate work burden for women, protection risks, conflict and tension, unsustainable livelihood activities and health risks. The FAO SAFE approach provides a multi-sectoral response these diverse challenges and contributes to resilience building in protracted crises (FAO 2016b).

FAO's SAFE approach comprises three interlinked pillars:

- 1. Ensuring a sustainable supply of energy**, by promoting sustainable natural resource management, sustainable bioenergy production and the use of alternative and renewable energy sources.
- 2. Addressing energy demand**, through the promotion of fuel-saving cooking practices and fuel-efficient technologies for cooking, heating and livelihood activities.
- 3. Promoting sustainable livelihoods** by promoting income-generating activities in both energy- and non-energy sectors as an alternative to selling woodfuel.

SAFE activities can have important multiplier effects that encompass improved food security, reduced malnutrition, sustainable management of natural resources, small-scale employment generation, livelihood diversification, women and youth empowerment, improved health, climate change mitigation and adaptation, increased resilience in the face of natural hazards and disasters, and contributions to sustaining peace.

The FAO SAFE approach is particularly adaptable to regions and countries facing protracted crises. Protracted crises are increasingly recognized to be a special category, requiring a different set of approaches and interventions by the humanitarian and development communities. Protracted crises have been defined as “those environments in which a significant proportion of the population is acutely vulnerable to death, disease and disruption of livelihoods over a prolonged period of time. The governance of these environments is usually very weak, with the state having a limited capacity to respond to, and mitigate, the threats to the population, or provide adequate levels of protection” (Harmer & Macrae 2004). This is a somewhat fluid definition, because all protracted crises are not the same. They do, however, share some (but not necessarily all) of the following characteristics: (1) duration or longevity; (2) conflict; (3) weak governance or public administration; (4) unsustainable livelihood systems and poor food security outcomes; and (5) breakdown of local institutions (FAO 2010b). The use of the SAFE approach also provides an opportunity to encourage and foster learning from different perspectives by assessing

how people in diverse vulnerability contexts tackle problems of energy access and to build on past interventions that have been successful in addressing these challenges.

SAFE and FAO's mandate

The multi-sectoral challenges related to energy access make it crucial to view the issue in a broader frame. FAO's work is structured around five Strategic Programmes. These Strategic Programmes were developed in response to the analysis of the main global challenges that member countries and the broader development community face and they represent the main areas of work FAO will focus its efforts on in order to contribute to the three main goals of the Organization .

The SAFE approach is a key component in FAO's Strategic Programme 5 – Increase the resilience of livelihoods to threats and crises. Building resilient livelihoods is a crucial endeavor in helping the most vulnerable populations achieve food security. Conflict settings and protracted crises are recognized by FAO as the most challenging contexts in which to fight hunger and malnutrition. By helping to provide access to sustainable forms of energy, improving the safety and efficiency of the way energy is used and by diversifying livelihood portfolios, FAO can make a significant and effective contribution to building the resilience of vulnerable populations in these settings. Besides the strong link with resilience, the SAFE approach is also strongly linked to the other Strategic Programmes (see Box 1).

The SAFE approach can also support the implementation of the FAO Strategy on Climate Change, given the linkages between energy, forests, climate change mitigation and adaptation. Through the Strategic Programmes 3 and 5, SAFE can contribute to the implementation of the strategy by addressing social and environmental risks related to forced migration and conflict over natural resources.

BOX 1. Five Strategic Programmes of FAO

Strategic Programme 1: Contribute to the eradication of hunger, food insecurity and malnutrition

Strategic Programme 2: Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner

Strategic Programme 3: Reduce rural poverty

Strategic Programme 4: Enable more inclusive and efficient agricultural and food systems at local, national and international levels

Strategic Programme 5: Increase the resilience of livelihoods to threats and crises

BOX 2. SAFE approach aligned with CFS-FFA Principles

Principle 1: Meet immediate humanitarian needs and build resilient livelihoods;

Principle 2: Focus on nutritional needs;

Principle 4: Protect those affected by or at risk from protracted crises;

Principle 5: Empower women and girls, promote gender equality and encourage gender sensitivity;

Principle 9: Contribute to peacebuilding through food security and nutrition;

Principle 10: Manage natural resources sustainably and reduce disaster risks.

The SAFE approach can contribute to outputs under Outcome¹ of the Strategy, including:

- Supporting NDC implementation through technical interventions on the ground.
- Developing and adopting Disaster Risk Reduction (DRR), adaptive and preventive approaches.
- Developing new guidelines and documents that support countries in addressing climate change more effectively.
- Strengthening national and regional institutional capacity to generate, collect and use data that enhances their ability to address climate change.
- Development and dissemination of tools to assist in the analysis and planning for the impacts of climate change.

Furthermore, the FAO SAFE approach should be viewed in the context of other global processes and initiatives that FAO is involved in, such as the Framework for Action for food security and nutrition in protracted crises of the Committee on world Food Security (FFA-CFS), the Sendai Framework for Disaster Risk Reduction, the Global Migration Group and the New York Declaration. For example, the SAFE approach is well aligned with a number of principles of the FFA-CFS and will contribute to their implementation (see Box 2).

FAO's work on SAFE will also contribute to the main goals of the Moving Energy Initiative, including:

- Offering solutions for delivering energy in situations of forced displacement in a manner that reduces costs, is safe, health and respectful, and also benefits host countries and communities.
- Creating opportunities for income generation and knowledge transfer to tackle energy poverty and improve energy sustainability.

¹ "Enhanced capacities of Member Nations on climate change through FAO leadership as a provider of technical knowledge and expertise"

Holistic perspective

FAO's work on Safe Access to Fuel and Energy (SAFE) adopts a holistic, multi-faceted approach which takes into account the mutually reinforcing linkages between energy and nutrition, disaster risks and climate change, conflict, health, gender, protection and livelihoods.

The multisectoral nature of energy access

Nutrition

Improving nutrition is fundamental to achieving FAO's vision of a world without hunger. Nutrition is increasingly being understood as not only an outcome of social and economic development, but also as an essential input, affecting health, productivity and overall well-being (FAO 2014a). The causes of undernutrition include the limited availability of and access to food of sufficient quantity (energy) and quality (nutrient content), poor caring and feeding behaviours for children and poor food choices for adults, and inadequate health care and an unhealthy environment. The impact of these factors cut across multiple sectors, including food, agriculture, health, social protection, gender and education.

Ensuring access to energy is intrinsically linked to the goal of improving nutrition. When cooking fuel is not readily available, it can have a considerable impact on the nutrition of vulnerable populations. The time women spend collecting fuelwood directly affects the time available for caring and feeding of children with possible negative impacts on nutrition. Other nutrition risks associated with a lack of energy for cooking include (SAFE 2017):

- Undercooking meals, which increases the risk of foodborne illnesses
- Skipping meals, which can lead to malnutrition especially in children
- Switching to less nutritious foods with shorter cooking times
- Selling and/or trading food to obtain cooking fuel, leaving vulnerable people with less food
- Insufficient boiling of water, resulting in the consumption of contaminated water and/or poorly prepared food

Limited access to energy negatively affects the quantity, quality and nutritional value of the food consumed. In the context of forced displacement, the problem of energy access is even more pronounced. The distribution of food, e.g. dried beans, grains and flour to refugees and IDPs, is often not complemented by the distribution of cooking fuel (SAFE 2017). Displaced people are in many cases banned from collecting fuelwood on government land or land used by the host community. With few livelihood opportunities and meagre savings, there is little money to spend on cooking fuel. In these situations, the scarcity of fuelwood and other sources of energy increases the risk of malnutrition.

A study in Chad showed that almost 35 percent of displaced households surveyed reported skipping meals and 28 percent reported undercooking their meals because they lacked cooking fuel (Lahn & Grafham 2015). In a



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Tree nursery in Maiduguri. Project staff water the seedlings. Maiduguri, Borno, Nigeria.

The promotion of fuel-efficient technologies and improved cooking practices can help prevent or mitigate the risk of malnutrition

study in the Dollo Ado camps in Ethiopia, 38 percent of households surveyed reported that they undercooked food and 28 percent reported that they sold food rations to buy cooking fuel (Lahn & Grafham 2015). In a sample of 702 households in Ugandan refugee camps, 44 percent of respondents reported that they skip meals once a week, 10 percent sell over a quarter of their family food ration to buy cooking fuel and roughly 50 percent undercook their food more than twice a week (Lahn & Grafham 2015).

The promotion of fuel-efficient technologies and improved cooking practices can help prevent or mitigate the risk of malnutrition. Baselines of the impact of existing cooking technologies and cooking practices on energy consumption should be established. When carrying out these assessments, the participation of the local population is crucial in order to design interventions that can support the realization of positive change in cooking habits. Furthermore, an in-depth understanding of existing cooking practices will enable a productive dialogue on energy-related issues with key stakeholders. For example, the important role of women in ensuring the supply of cooking fuel for the household should be emphasized and women should play a crucial part in discussions and capacity building activities. Such activities include trainings on the use and maintenance of fuel-efficient stoves and the use of fuel-saving cooking practices.

Disaster risks and climate change

Climate change is a major cause of the increased frequency and severity of natural hazards, such as droughts, floods and landslides. These extreme events have a significant impact on access to energy. Natural hazards and climate change contribute to ecosystem degradation, including increased soil erosion, declining rangeland quality, salinization of soils and biodiversity loss. As a result, the goods and services available to local communities are reduced and economic opportunities and livelihood options may shrink. This pushes an increasing number of people to eke out precarious and unsustainable livelihoods and to search for fuelwood and other sources of domestic energy in marginal and fragile environments.

Conversely, the inefficient production and use of wood energy resources contribute to climate change. A large part of the world's population relies on burning solid biomass on open fires or inefficient stoves. Estimates vary between 2.4 and 3 billion people who rely on these inefficient and polluting means of cooking (FAO 2016a; GACC 2015; IEA 2016; SEI 2009). The incomplete combustion of these fuels on open fires or in inefficient stoves produce black carbon emissions. Climate scientists have recently ranked black carbon as the second or third largest warming agent in the context of climate change, after carbon dioxide and alongside methane (WB 2011). An estimated 23 percent of all global black carbon emissions have been attributed to the use of rudimentary domestic stoves, with Sub-Saharan Africa accounting for 6 percent of this number (Practical Action 2014; WB 2014).

Environmental degradation associated with energy needs contributes to increasing disaster risks, such as forest degradation and deforestation caused by unsustainable cutting of fuelwood and inefficient production of charcoal. The depletion of wood resources not only affects the multiple actors who depend on them, but also impairs fragile ecosystems. It reduces the capacity of livelihoods and ecosystems to absorb the impacts of climate change and increases the vulnerability of local populations. Furthermore, forests play a significant role in climate change mitigation by acting as “sinks”, absorbing carbon from the atmosphere to store it in biomass and soils (FAO 2013b). When forests are cleared or degraded, they become significant sources of Greenhouse Gas (GHG) emissions. Deforestation and forest degradation account for 11 percent of GHG emissions, more than the entire global transportation sector and second only to the energy sector (UN-REDD 2016).

Populations living in areas of risk utilize a number of coping strategies in response to disasters caused by natural hazards. These include reducing food intake, producing charcoal, selling assets and relying on the consumption or sale of forest products, e.g. fruits and honey. However, many communities are faced with a new set of climate change-related challenges which often go beyond the local ability to cope. Environmental threats are becoming more frequent and result in less time for local populations to recover. In order to reduce disaster risks and respond to climate change, it is vital to strengthen the resilience of the natural resource base and to promote sound and conflict-sensitive environmental resource management practices. Healthy ecosystems are more resilient to hazards (FAO 2016a). Hence, there is a need to promote climate resilience, i.e. strengthening the resilience of a system to climate-related shocks and the ability of individuals, communities and systems to survive, recover and even thrive under a changing climate. Government policies play an important role in creating an enabling environment to support vulnerable populations build resilience by working towards a synergy between Disaster Risk Reduction and Climate Change Adaptation and Mitigation efforts. Community-based approaches and inclusive natural resource management regimes, with a strong emphasis on the supply of fuel, are vital in this regard.



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Assessing stoves and cooking fuel needs around Nget Chaung IDP camps, Myanmar.

Livelihoods

Protracted crises are often characterized by multiple and interlinked risks and stresses including environmental degradation, food insecurity, conflict and displacement. In these contexts, where livelihood opportunities may be very limited, vulnerable populations may resort to unsustainable coping strategies. Coping strategies related to energy needs include engaging in unsustainable and short-term livelihood activities such as the collection of fuelwood and the production of charcoal. These activities are considered high-risk livelihood strategies which have a negative impact on the status of forest resources and which push people further into unsafe areas in order to collect and produce woodfuels. These activities may increase tension between local and displaced communities, such as refugees and IDPs (FAO 2010b).

In some contexts, women have adopted the sale of fuelwood as a way of diversifying their livelihoods. In Namoruputh (Northwestern Kenya), for example, selling fuelwood is an important source of income for women and constitutes more than 20 percent of the total income they earn (Omolo 2010). However, when women go out to collect fuelwood, both for household use and for selling, they spend long periods of time away from home while being exposed to Gender Based Violence (GBV), wild animal attacks and other forms of protection risks. This time could be used for other activities which are more sustainable and profitable, e.g. the collection and sale of Non-Wood Forest Products (NWFPs) such as honey, medicinal plants and gum. Charcoal production and selling is also an increasingly important livelihood activity in protracted crises, especially in rural and peri-urban areas. The importance of producing charcoal as a livelihood activity can be explained by the rapid growth in urban populations, who depend on charcoal to satisfy their daily cooking energy needs. Traditional charcoal production relies heavily on hardwood tree species and is often associated with the depletion of forest resources in rural areas and the selective felling of trees may result in a considerable loss of biodiversity. These activities are not only unsustainable from an environmental point of view, but also from an economic perspective.

The process of producing charcoal in inefficient traditional earth kilns, for example, results in a very low conversion efficiency, roughly between 10-22 percent (FAO 2017). In modern industrial kilns, on the other hand, the conversion efficiency can be as high as 40 percent. If more efficient production methods for charcoal production in developing countries are adopted, it could potentially contribute to an increase in profits while reducing pressure on forest resources. An important consideration in reducing forest degradation is the sustainable sourcing of wood for charcoal production, e.g. the use of dead wood, invasive species or woodfuel produced and harvested sustainably from woodlots.

A clear link also exists between the increasing importance of charcoal production as an income-generating activity and poverty. The lack of alternative livelihood opportunities, especially in crises and complex

Access to sustainable energy can also boost agricultural processing activities

emergencies, drives more and more people into the charcoal sector. Production of charcoal has pro-poor features, being low in both technology and start-up costs, and because of the availability of ‘free resources’ (Iiyama *et al.* 2015). At the same, the association of charcoal production with poverty has created a stigma towards the people involved in these activities. Charcoal production is often seen as a last resort, when all other livelihood options are exhausted.

The diversification of livelihoods is an important strategy for building resilience, especially in the context of a changing world with mounting population pressures, negative impacts of climate change and increasing levels of civil conflict. If people combine several livelihood activities in diverse portfolios, they will be better prepared to cope with hardships in times of scarcity. Energy products and services may play an important role in sustainable livelihood portfolios, such as the production and sale of fuel-efficient stoves and agroforestry activities. Access to sustainable energy can also boost agricultural processing activities, including the drying of crops and fish, or the preservation of food, for example through solar fridges. These activities can not only generate income and create new employment opportunities, but can also help to reduce the demand for woodfuel (FAO 2011).

Conflict and tension

Conflict is a complex and multi-dimensional issue, which is strongly linked to access to energy and other natural resources for both local and displaced populations. On the one hand, individuals or groups of people will strive towards ensuring improved access to energy in order to address basic cooking and livelihood needs. When this access is imperiled, it may become a cause or amplifier for conflict. On the other hand, conflict-induced displacement will in many cases put pressure on natural resources, affecting access to energy resources such as woodfuel and other types of biomass fuels, particularly in environmentally fragile areas.

The relationship between conflict and energy access is highly context-dependent. Cultural practices, demographic patterns, environmental management mechanisms, governance capacity and political and economic considerations all play a significant role. Ongoing processes of urbanization, for example, are transforming traditional biomass products into market commodities, e.g. in the form of charcoal, resulting in increased competition over natural resources. Furthermore, climate change, causing more frequent and severe droughts and erratic rainfall, leads to increased competition for already scarce natural resources, especially in situations where large and crowded displacement camps have been established. Other potential conflict stressors include increasing population pressure, easy access to small arms, inter-ethnic violence, political marginalization, election-based violence and conflicting territorial claims. A number of important dimensions, of particular relevance to protracted crisis situations, include:



Individuals often travel long-distance to collect wood needed for their cooking needs such as this group of Rohingya refugees from the Kutupalong Refugee Camp, Cox's Bazar, Bangladesh.

- **Ethnicity:** When analyzing conflict and energy access, it is important to take ethnicity into account. The ethnic composition of a certain area can be very diverse. Powerful and dominant ethnic groups are often in control of areas with more resources, leaving marginal areas for less dominant ethnic groups (FAO 2015b). In the drylands of Kenya, for example, more than 40 ethnic groups can be discerned.
- **Displacement:** Access to and control over natural resources is an important issue in the surroundings of refugee camps (FAO 2016b). Because of the location of many camps in environmentally fragile areas, with scarce availability of natural resources, tension between host communities and refugees are a frequent challenge. For example, refugees may collect fuelwood in forest areas on which host communities also depend which may be a trigger for conflict events. The risk of conflict is not exclusive to host-refugee settings. Charcoal producers may compete with pastoralists for access to trees which are used by communities for other purposes, e.g. the production of livestock fodder and shade for animals.
- **Pastoralism:** Pastoralism entails a highly mobile way of living, following rain patterns and good grazing grounds for livestock production. It relies on a rich traditional knowledge of surviving in

harsh environments. However, pastoralists are often misunderstood, marginalized and excluded (FAO 2016d). The high mobility of pastoralists takes them into territories of neighbouring communities and onto farmlands. When traditional grazing lands are compromised, e.g. by drought, existing land use arrangements are increasingly abandoned and conflicts between different communities may arise.

The above highlights the need to ensure that SAFE interventions are conflict-sensitive, with a strong emphasis on preventive measures. This will ensure that the design, implementation and outcomes of interventions do not undermine peace or exacerbate conflict, and contribute to peace where possible. Careful attention should be paid to potential conflict stressors in order to address these in SAFE programmes, e.g. by carrying out solid conflict analyses and building perception of conflict and social cohesion into M&E systems. When conflicts do erupt, local governments and conflict-affected communities face enormous challenges in the aftermath. Human and financial resources may be scarce, the capacity to deliver services weak and society may be highly divided. The strengthening of effective, inclusive and sustainable local governance together with building trust and confidence between various social groups are crucial elements that contribute to establishing lasting stability and peace. Being aware of and understanding the risk of tension and conflict over natural resources, such as the collection of fuelwood, is central to identifying appropriate solutions to energy-related challenges in protracted crises.

Women's health and safety

The burden of collecting fuelwood and preparing meals for the family is primarily shouldered by women and children (FAO 2016b). In displacement contexts, most fuelwood is collected and carries an invisible cost in terms of productive time lost and exposure to protection risks (Lahn & Grafham 2015). When women and children spend hours searching for and collecting fuelwood, it also leaves less time for educational and leisure activities. Women are thus less involved in income-generating activities, child care activities and other ways to support themselves and their family, while children are not able to attend school. Furthermore, the collection of fuelwood poses the risk of exposure to Gender Based Violence (GBV). Walking long distances in insecure areas exposes women to the risk of harassment, physical assault, abduction and rape in addition to other existing dangers such as wild animal attacks. The absence of energy for lighting, e.g. inside camps, further increases these risks. Having a light at night will not only increase safety, but will also allow children to do their homework after dark. Improved lighting can also potentially allow some income-generating activities to continue after dark (UNHCR 2014). Besides protection risks, women and children also face considerable health risks when cooking using traditional biomass, such as fuelwood. Indoor air pollution, caused by cooking on open fires or in traditional stoves in poorly ventilated spaces, particularly affects women and young children since they spend the most time near the domestic hearth. It is estimated that up

to 4 million premature deaths each year are attributed to respiratory and cardiovascular diseases caused by indoor air pollution (WHO 2014).

In many cases, women do not have an alternative to collecting fuelwood in dangerous areas. Depending on the specific situation, women employ a number of coping strategies, such as the selling of food in order to buy cooking fuel. This is most common in refugee camps, when people depend on food rations and may not be allowed to make use of surrounding natural resources. Malnutrition is an important consequence of this coping strategy (UNHCR 2014). Another coping strategy is survival or transactional sex in which women are forced to trade sexual favors in order to be able to afford or obtain cooking fuel. This strategy is usually an urban phenomenon, where fuel is more likely to be purchased than collected and where prices for cooking fuel tend to be higher. Survival sex has significant consequences for personal safety, health and dignity (UNHCR 2014; WFP 2012).

It is important to take into account the disproportionate work burden and associated protection risks faced by women when assessing energy needs. Women play an essential role in ensuring household food security and nutrition, through the collection of fuelwood and food preparation. Due to their differing household roles, women and men have distinct ways of responding to limited access to energy. Women are often hit hardest when households have insufficient access to cooking fuel. The hours that women



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A woman starts a fire in her mudstove in order to boil water. Maiduguri, Borno, Nigeria.

Women, as the primary users of household energy resources and technologies, often have the best understanding of local needs, resources and dynamics in the field of household energy

must spend collecting fuelwood weighs heavily on the freedom of choice for women to organize their life and engage in activities they would prefer. An in-depth gender analysis is necessary in order to design and implement SAFE-related programmes. Women, as the primary users of household energy resources and technologies, often have the best understanding of local needs, resources and dynamics in the field of household energy. At the same time, women tend to be excluded from or only have limited access to decision-making processes, for example on whether or not to purchase improved cooking technologies such as fuel-efficient stoves. Men are in many cases gatekeepers to women's access to technology.

The Water – Food – Energy – Ecosystems Nexus

An estimated total of 768 million people do not have access to an improved source of water while an estimated 3.5 billion people do not have their rights to water fulfilled. Furthermore, an estimated 2.5 billion people are without access to improved sanitation (WWAP 2014). These figures are often representative of the same people who use solid fuels (mainly biomass) for cooking, which number approximately 2.6 billion (WWAP 2014). Global water demand is projected to increase by 55 percent by 2050. This will put a strain on the availability of freshwater and it is estimated that more than 40 percent of the global population will be living in areas of severe water stress by 2050. In protracted crises, ensuring sustainable and equitable access to water supply, sanitation and hygiene poses a serious challenge, which is undermined by a lack of complementarity in humanitarian and development approaches (ODI 2016).

Concerns over access to water are intrinsically linked and highly interdependent with issues of food insecurity and malnutrition, limited access to energy and the degradation of ecosystems. All four elements are crucial for human well-being, poverty reduction and sustainable socio-economic development. Energy, on the one hand, is required to produce and distribute water and food. It is used to pump water from groundwater or surface water sources, to power irrigation machinery, to heat, cool and purify water, and to process and transport agricultural goods. Food production and supply chains account for about 30 percent of total global energy consumption. Water, on the other hand, is necessary for the production of energy resources. The production of woodfuels and other forms of bioenergy is considered one of the more water intensive types of energy production. An increased water withdrawal for bioenergy resources may reduce the availability of water for food crops, thus placing food security at risk. Finally, ecosystems, such as forests, wetlands and grasslands, are at the heart of the global water cycle. The unsustainable harvesting of woodfuel resources can negatively affect the biophysical process of the water cycle. The Mau Forest, Kenya's largest water tower, is a good example. Despite its official status as a protected area, large parts of the forest were cut by farmers in order to cultivate the land, causing major disturbances in the hydrological function of the water reservoir and the local water level and climate (Van de Giessen 2011).

Often the poorest people are hit the hardest because they lack the basic means to cope or recover

The nexus between water, food, energy and ecosystems builds on the work of the United Nations (UN) Committee on World Food Security (CFS). During the 2015 United Nations Climate Change Conference (COP 21), this work was certified as an effective contribution to combat climate change. FAO has developed a Water – Energy – Food nexus assessment methodology in the context of the Sustainable Energy for All Initiative (FAO 2014c). Fetching water and collecting fuelwood pose very similar risks, especially for women, including exposure to protection risks and a significant work burden. Where possible, efforts to ensure safe and reliable access to energy should include considerations of how water, food and ecosystem services are linked. In protracted crises, which may be characterized by natural resource scarcity, conflict and natural hazards, such an approach is highly relevant.

Underlying principles

Building resilience

Resilience refers to the ability of people, communities or systems to prevent disasters and crises as well as to anticipate, absorb, accommodate or recover from them in a timely, efficient and sustainable manner. This includes protecting, restoring and improving livelihood systems in the face of threats that affect agriculture, nutrition, food security and food safety. Disasters and crises, both natural and manmade, affect millions of people every year. Often the poorest people are hit the hardest because they lack the basic means to cope or recover. Dependence on the production, trade and consumption of livestock, forest and other natural resources makes them vulnerable to emergencies, such as droughts, floods, earthquakes, disease outbreaks and wars. Climate change is an intensifying factor, increasing both the frequency and magnitude of natural hazards. Climate change is also a threat multiplier which can negatively affect the availability of natural resources, food security and water availability, which in turn can cause migration, resource competition, political destabilization and conflict (UNEP 2011).

Helping countries to control, prevent and mitigate risks, as well as helping them to prepare for disasters in an efficient and sustainable manner are crucial for building resilience. It will boost the capacity to absorb, prepare for, and prevent disasters and crises, while contributing to the adaptation of livelihoods and food systems. Enhancing resilience to shocks requires action on local, national, regional and global levels. In the context of protracted crises, it is especially crucial to do this in a well-coordinated, integrated and cross-sectoral way. The guiding principle of building resilience is well aligned with and will contribute to the rolling out of the Strategic Programme 5 of FAO and Principle 1 of the Framework for Action of CFS (CFS-FFA) (CFS 2015; FAO 2013d; FAO 2015a).

FAO's Regional Initiative "Building Resilience in Africa's Drylands" aims to develop strategies, interventions and innovations that can strengthen

the resilience of vulnerable populations to threats. Equal access to and control over resources and incomes by women and men is at the heart of the initiative. The diversification of livelihoods, sustainable natural resource management and climate-smart agriculture are some of the ways to reduce vulnerability and build resilience. Having safe and sustainable access to fuel and energy is a key factor in enhancing the resilience of local populations in these dryland areas. It will improve the food security and nutrition of people in the face of conflict, increasing droughts or erratic rainfall. Furthermore, it can provide alternative livelihood opportunities and can reduce environmental degradation by promoting the sustainable production and use of wood resources.

Conflict sensitivity

Conflict prevention, management and resolution is of key importance to ensuring that vulnerable populations are able to collect or produce woodfuel or other forms of biomass in a safe manner. In 2016, the General Assembly and the Security Council adopted substantively identical resolutions on peacebuilding. The term sustaining peace was introduced, referring to ‘activities aimed at preventing the outbreak, continuation, escalation and recurrence of violent conflict’ (UNPBSO 2017). FAO has considerable expertise in working in conflict affected situations and, importantly, in contexts where the risk of conflict has been mitigated by FAO’s work in agriculture, forestry, fisheries, natural resources and food security. Whilst these efforts have rarely focused explicitly on building sustainable peace, they provide a foundation for enhanced engagement by FAO and its partners in this area, particularly within the context of Agenda 2030. FAO intends to build on these experiences through further analysis to identify best practices. The Organization has worked ‘on’ conflicts by analyzing and addressing conflict risks and drivers, ‘in’ conflicts to address the impacts of conflicts, saving lives and supporting livelihoods, and ‘through’ conflicts to advance sustainable development in a conflict-sensitive manner. As a conflict-sensitive approach, SAFE aligns itself with Principle 9 of the Framework for Action for food security and nutrition in protracted crises of the Committee on world Food Security (FFA-CFS), namely contributing to sustainable peace through food security and nutrition (CFS 2015).

Furthermore, the Human Security Approach provides valuable guidance, by stating that “all individuals, in particular vulnerable people, are entitled to freedom from fear and freedom from want, with an equal opportunity to enjoy all their rights and fully develop their human potential” (UNTFHS 2012). Ensuring a secure environment in which people can move freely should be a key priority in food security and nutrition related interventions. Efforts to strengthen social cohesion are of key importance to sustaining peace. A socially cohesive society is one in which “people are protected against life risks, trust their neighbors and the institutions of the state and can work towards a better future for themselves and their families” (UNDESA 2012). Social cohesion is the glue that holds

society together and is built around the key values of social inclusion, social capital and social mobility. Social inclusion means that citizens can participate equally in political and socioeconomic life and are protected in times of need. Social capital revolves around trust, both between people and in institutions, and the sense of belonging to a certain society. Social mobility refers to the idea of equality of opportunities to get ahead in life. Given the potential risk of conflict over the collection and production of woodfuel in displacement settings, where various social groups may compete over natural resources, FAO will design SAFE interventions that are conflict-sensitive and which support social cohesion.

Gender equality

Gender equality is a basic human right and one of the cornerstones of FAO's mandate to achieve food security for all. It is essential to attaining the goals of raising the levels of nutrition, improving agricultural productivity and natural resources management, and improving the lives of rural populations. FAO's Policy on Gender Equality (FAO 2013c) is an important instrument for guiding the efforts to achieve gender equality in all of the Organization's technical work and for assessing results. Women cover a wide range of roles and are not only caregivers, but also farmers and food producers. In agriculture and rural development, they attend to a diverse range of tasks. Women's access to productive resources such as land and to services such as credit are in many cases restricted. Women face overt and implicit discrimination. This gender gap reduces women's productivity and diminishes their contributions to the agricultural sector, affecting not only the wellbeing of women but also their families. Closing this gap could help to achieve food security and lift people out of poverty. A clear link exists between women's work burden and energy access in terms of the time spent on the collection and use of fuelwood which, in addition to being time-consuming, is often detrimental to women's health and associated with significant opportunity costs. Collecting fuelwood leaves little time for child care, income-generating activities and leisure.

Assessing fuel needs and challenges faced by affected populations.. An FAO Focus Group Discussion with female refugees inside the Kakuma camp, Rift Valley, Kenya.



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Women cook a meal using dried fish and vegetables in the Banadir camp for Internally Displaced Persons, in Bosaso, Puntland state, Somalia. Under a livelihood development program funded by FAO, several groups of IDP women have learned to process, dry, market and sell locally sourced fish.

Participation

Participation is the process of equitable and active involvement of all stakeholders in the formulation of development policies and strategies and in the analysis, planning, implementation, monitoring and evaluation of development activities. The contribution of rural communities to programme planning, implementation and evaluation can ensure that target populations have increased knowledge, influence and control over the humanitarian or development interventions affecting them. Such empowerment of poor and marginalized stakeholders is a key principle in any development effort. The explicit incorporation of participation in programme objectives, approaches and methodology can lead to broader access of all stakeholders to resources and decision making processes and a greater sense of ownership (Van Heck 2003).

The consultation and participation of local populations is essential for SAFE programmes to achieve long-term social sustainability. It is important to take an insider's perspective when programmes are designed, especially those in which a fundamental change in habits and attitudes may be beneficial. Top-down approaches, which are based on predesigned and non-consultative frameworks, often do not take into account for the rich traditions and experiences of the people they aim to reach. Participatory approaches are crucial to get the support of the whole community and to achieve genuine change. The use of participatory approaches in SAFE programmes is aligned with Principle 7 of the CFS-FFA, namely to strengthen country ownership and participation (CFS 2015).

Accountability to affected populations

Accountability to Affected Populations (AAP) is at the core of FAO's humanitarian and development interventions. It stands for "an active commitment by actors and organizations to use power responsibly by taking account of, giving account to, and being held to account by, the people they seek to assist" (FAO 2013a). AAP is a people centered approach, putting the dignity of all human beings affected by disaster and conflict at the forefront. In humanitarian situations, accountability is highlighted because of the increased vulnerability of affected people and the power imbalance between aid providers and recipients. Of particular importance is the participation and equal access to assistance by women, men, girls and boys. AAP also provides a framework to prevent sexual exploitation and abuse by FAO and partner staff and to integrate issues such as gender equality, protection and inclusion of the aged and disabled. Achieving greater transparency and a two-way communication with affected communities is the ultimate goal (FAO 2013a).

When designing interventions to ensure energy access in emergencies and protracted crises, AAP will play a key role in guiding implementation. A sustainable and long-term change in the way of life of affected communities is necessary to improve food security and nutrition. This entails an intensive exercise in intercultural communication, with people

A sustainable and long-term change in the way of life of affected communities is necessary to improve food security and nutrition

from different cultural backgrounds coming together in dialogue to discuss appropriate solutions. The introduction of new fuel-efficient stoves models is a good example. When barriers exist to the adoption of certain types of fuel-efficient stoves, it is important to know why. This often has to do with traditions and cultural habits.

Partnerships

In order to perform its institutional role in the international governance of agricultural development, FAO must help to mobilize the world's best knowledge and capacities. It has been increasingly acknowledged that linking up with other relevant institutions is necessary to achieve shared goals. Not surprisingly, partnerships are at the heart of FAO's mission. It refers to "cooperation and collaboration between FAO units and external parties in joint or coordinated action for a common purpose. It involves a relationship where all parties make a contribution to the output and the achievement of the objectives rather than a solely financial relationship" (FAO 2012a). Partnerships can be of varying duration and have an instrumental and operational role in enhancing FAO's effectiveness. Decisions on partnerships are based on specific comparative advantages of FAO and the partners concerned. It provides the potential for cost savings and broadening the scope of expertise. Partnerships can be of a horizontal nature, when looking for complementarities, or of a vertical nature, when sharing responsibilities for upstream and downstream activities (FAO 2012a).

Partnerships should be set up and strengthened with other UN agencies, development and humanitarian organizations, civil society organizations and Non-Governmental Organizations (NGOs), government bodies, academic institutions and the private sector in order to respond to the fuel and energy needs of crisis-affected populations in an effective and consistent manner. This will lead to a streamlining of actions and will reduce the risk of overlap. In this way, SAFE can be a truly inclusive and holistic approach, which fully integrates multiple sectors and stakeholders.

Capacity building

Capacity building refers to "the process whereby individuals, organizations and society as a whole unleash, strengthen, create, adapt and maintain capacity over time" (FAO 2015c). Development processes should be led and managed by national actors and agencies, as an endogenous process. FAO plays a supporting role in this, by strengthening the capacities of others to achieve their own goals in food security. Capacity building will result in an increased level of skills and knowledge, benefitting local communities, governments, partner organizations and staff members. Participatory trainings at the national and local level, for example, can be organized to achieve this. Training should not only involve technical aspects, but also social and political aspects (FAO 2015c; UNHCR 2014).

Capacity development is essential for improving the quality of SAFE

Capacity development is essential for improving the quality of SAFE programmes implemented in emergencies and protracted crises and to expand knowledge on the topic. FAO has extensive expertise in domains such as food security, bioenergy, forest management, nutrition, gender and other key areas which are intrinsically related to issues of fuel and energy. Harnessing this expertise for the purpose of local capacity building will help to ensure the long-term sustainability of interventions. SAFE-related capacity needs assessments of personnel and partners are one way of developing a capacity building strategy. Besides this, it is important to identify new partners with skills and expertise in the field of SAFE. Training which is of particular relevance to SAFE includes the enhancement of skills in agroforestry management techniques and the production and maintenance of fuel-efficient stoves and other food utilization technologies. These skills can be transferred through Training of Trainers and Farmer Field Schools programmes. Ideally, over time, capacities will increase to a point where locally trained individuals can conduct research and provide guidance on the same issues (FAO 2015c; UNHCR 2014).

Measuring impact

Effective measurement of impact is key to the success of SAFE programmes. The establishment of baselines will make it possible to build a reliable evidence base and will allow for effective monitoring, reporting and evaluation activities (UNHCR 2014). Energy needs assessments should be a central part of a SAFE baseline. Important elements to consider are the type of fuel and stove used, cooking equipment, cooking behaviors and practices, and how natural resources are managed. The collection and verification of information is often a laborious, costly and time-consuming exercise. Therefore data collection should be designed in a way that allows for flexibility and relies on both quantitative and qualitative methods. The Technical Handbook on Assessing Woodfuel Supply and Demand in Displacement Settings (FAO and UNHCR 2016) provides some guidance on how to measure impact. A sound understanding of the specific context is crucial to monitoring and evaluation. Trauma, cultural taboos, stigma, shame and fear of reprisal are important elements that interfere with the process of data collection. The climate of conflict and displacement, which is often present in protracted crises, may affect the degree to which people are willing to share their experiences. Therefore, confidentiality and cultural sensitivity should be a priority (WFP 2012). Furthermore, a comprehensive analysis of energy access in emergencies and protracted crises should be integrated or linked to broader assessments of poverty, risk, vulnerability and gender. Where possible, the use of common analytical frameworks, quality standards and protocols will increase objectivity and impartiality (CFS 2015). The principle of measuring impact aligns with Principle 6 of the CFS-FFA, namely to ensure and support evidence-based analyses.

Refugees have been empowered to design their own fuel-efficient stoves and trained to produce solar bulbs using locally available materials such as plastic water bottles

Innovation

Innovation happens when new ideas, technologies and processes are adopted by individuals and groups and spread through communities and societies (FAO 2014b). The capacity to innovate is highly dependent on access to sufficient resources, which is most often lacking in countries in protracted crisis or those significantly affected by acute emergencies. Scarce investments, poor financial management and limitations in technology transfer strategies are a common constraint to innovation. FAO aims to address these issues through agricultural innovation systems, which refers to “all individuals, organizations and enterprises that bring new products, processes and forms of organization into use to achieve food security, economic development and sustainable natural resource management” (FAO 2013e). The development of an enabling environment and the provision of policy advice and technical assistance, by means of studies, policy dialogue, networks and partnerships at all levels, are very important conditions for innovation. Initiatives such as the Humanitarian Innovation Conference, deal with facilitating innovation in humanitarian issues. This includes innovative thinking about ways in which sustainable energy could be delivered and the challenges that hinder it. A bottom-up innovation approach has been adopted by the Energy Lab, which is a collaborative initiative of UNHCR Innovation and UNHCR’s Energy and Environment Unit. For example, refugees have been empowered to design their own fuel-efficient stoves and trained to produce solar bulbs using locally available materials such as plastic water bottles.



Cooking technologies in Kakuma. A metal fuelwood stove. Rift Valley, Kenya.

Framework

The following sections present key objectives for FAO's work on SAFE. Each objective includes a set of performance and impact indicators which are, to the extent possible, aligned with the SAFE indicators being developed by UNHCR. The alignment of Monitoring and Evaluation systems is in the spirit of the World Humanitarian Summit Grand Bargain, particularly the two work streams which emphasize reducing duplication and increasing joint needs assessments.



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Clay combustion chambers of fuel-efficient stoves being cooked in Hargeisa, Somalia.

Objectives

Fuel-efficient stoves and fuel-efficient practices

Fuel-efficient stoves can significantly reduce the amount of fuel needed for cooking purposes and are timesaving for women; both in terms of time spent collecting fuelwood and time spent cooking. If used appropriately, the use of fuel-efficient stoves can lower protection risks for women by reducing the time they spend collecting fuelwood in insecure environments, while also allowing them to focus more on income-generating activities. It is important to recognize that not every fuel-efficient stove is appropriate in a given setting. The cultural preferences in a certain area and the lack of familiarity with certain types of stoves need to be taken into account, as well as the particular conditions found in refugee camps and IDP sites. Fuel-efficient stove also offer livelihoods opportunities, for example if women or youth are engaged in their production using local materials. Therefore, the selection of stoves should primarily be based on the availability of local materials, they should be easy to assemble and not require frequent maintenance. Of key importance is to carefully review past experiences with the promotion of fuel-efficient stove from the perspective of different actors, including humanitarian and development agencies, local and national governments as well as academic research. Furthermore, rural and urban communities, IDPs and refugees should be directly involved in the planning and implementation of fuel-efficient stove programmes. Consultations with stakeholders, prior to selecting and distributing fuel-efficient stoves, are important in order to align, to the furthest extent possible, traditions and cultural preferences with the most appropriate stoves. The development of awareness-raising and training activities around fuel-efficient stoves, specifically tailored for a given setting, will contribute to this participatory approach.

Fuel-saving cooking practices include the use of tight fitting lids, pre-soaking of hard foods (e.g. beans), milling of grains, cutting of food into smaller pieces (e.g. meat or hard vegetables), shielding of stoves from wind and controlling of air supply, communal cooking, the use of appropriate cooking pots (iron for slow cooking and aluminium for fast cooking) and putting out fires promptly. These measures could significantly contribute to the reduction of the amount of fuel needed for cooking purposes. Furthermore, changes in the type of foods prepared, e.g. fast-cooking types of rice instead of beans or millet, can also have a significant impact. However, it is important to exercise caution when replacing food types in order to save fuel

since the nutritional value of faster cooking food may be significantly lower. Furthermore, interventions designed to foster behavioural changes may be met with resistance and may take a long time. Adapting fuel-saving cooking practices to the local context is therefore crucial. Adequate baselines for cooking practices should be established since close examination of existing cooking practices will help to assess how SAFE interventions can impact fuel consumption. The participation of local or affected populations in these activities is crucial in order to achieve durable change. An in-depth understanding of and respect for traditional cooking practices will enable a productive dialogue with different stakeholders. The development of trainings, workshops and onsite demonstrations on fuel-saving cooking

Table 1. Performance and impact indicators for fuel-efficient stoves

Expected Results	Indicator	Sub-indicator	Type	Formula	Unit	Source
Increased access to fuel-efficient stoves	Distribution of fuel-efficient stoves	% of targeted households receiving a fuel-efficient stoves	Performance	$(\# \text{ of targeted households receiving a fuel-efficient stoves} / \text{Total \# of targeted households}) \times 100$	%	Implementing Partner survey
		% of distributed fuel-efficient stoves produced locally/ internationally	Performance	$(\# \text{ of distributed fuel-efficient stoves produced locally/ internationally} / \# \text{ distributed fuel-efficient stoves}) \times 100$	%	Implementing partner survey
Increased utilization of recently distributed fuel-efficient stoves	Utilization of fuel-efficient stoves	% of targeted households that use recently distributed fuel-efficient stoves or three stone fire or another cookstove	Impact	$(\# \text{ of targeted households that self-report using recently distributed fuel-efficient stoves or three stone fire or another cookstove} / \text{Total \# of targeted households visited who received a fuel-efficient stove}) \times 100$	%	Beneficiary survey
		\# of food vendors inside displacement camps using distributed fuel-efficient stoves	Impact	Total \# of food vendors using fuel-efficient stoves	\#	Implementing partner survey
Increased saving of money for households by reducing the buying fuel	Saving of money for households	Average household expenditure on all fuels for cooking per month	Impact	Total expenditure on all fuels for cooking by targeted households per month / Total \# of targeted households visited who received a fuel-efficient stoves	\#	Beneficiary survey
Increased adoption of fuel-efficient practices	Adoption of fuel-efficient practices	% of targeted households that use fuel-efficient practices	Impact	$(\# \text{ of targeted households that self-report using fuel-efficient practices} / \text{Total \# of targeted households}) \times 100$	%	Implementing partner survey

practices should also be rolled out. FAO's various Training of Trainers programmes, such as Farmer Field Schools, can be tailored specifically for these types of activities. Table 1 presents a set of proposed performance and impact indicators for the monitoring fuel-efficient stove interventions.



Direct current solar panels used for irrigation in the region of Baki, Somalia.

Renewable energy and alternative fuels

The transition to sustainable energy is recognized as a major challenge, especially in protracted crisis countries. However, the shift to cleaner and more sustainable forms of renewable energy has the potential to reduce the pressure on woody biomass resources. Diversifying fuel supply sources can enhance the resilience of rural and urban communities as well as displaced populations. However, changes in the types of fuel used are subject to cultural habits and preferences. Hence, in order to introduce new fuel and technology options, a participatory and bottom-up approach is crucial. This can be done by means of consultations and participatory sessions with all relevant stakeholders. Furthermore, assessments and market surveys can contribute substantially to highlighting the specific benefits of different types of alternative fuels. Such assessments should include consumer preferences, information about the willingness to pay for different fuels and stoves, and the income-generating potential for the local population. Ethanol, solar technologies and briquettes made from organic waste are some examples of alternative fuels that hold potential for reducing risks and addressing fuel needs:

- **Briquettes:** Waste from various sources – including agricultural residues, human and animal waste and charcoal dust – can be briquetted and used as fuel. The technology used to produce briquettes is based on the compacting of waste in order to concentrate energy and make combustion more efficient. Biomass wastes with high potential include different types of nut shell (e.g. coconut and macadamia nut), sawdust, bark, coffee husk and bagasse (a by-product of sugar processing). Dust left over from the charcoal production process can also be briquetted. An important condition for briquettes to be successful is the availability of low cost and low maintenance equipment for briquetting at the community level. Availability of agricultural residues can be a challenge, because availability may be seasonal and may have to be imported from other areas.
- **Ethanol:** Ethanol is a liquid fuel derived from the fermentation of biomass rich in sugar or starches (WFP 2012). There are possibilities for promoting the sustainable production and marketing of ethanol as an income-generating activity. The potential for producing ethanol locally in displacement settings should be explored, particularly so that economic ties are established between host communities and displaced households. Furthermore, ethanol stoves have certain advantages compared to other cooking technologies, such as portability and durability. They are easy to use, burn without smoke or soot and are safer to use. As a result, the use of ethanol stoves can help to reduce woodfuel consumption, reduce protection risks for women and children and improve indoor air quality.

Table 2. Performance indicator for access to renewable energy

Expected Results	Indicator	Sub-indicator	Type	Formula	Unit	Source
Increased access to alternative renewable energy resources	Alternative renewable energy	% of targeted households using alternative fuels	Performance	$\left(\frac{\text{\# of targeted households using alternative fuels}}{\text{Total \# of targeted households}} \right) \times 100$	%	Implementing partner survey

- Solar energy:** Solar cookers offer a clean, renewable form of cooking energy which does not require any collection or purchase of fuel or cause any harmful emissions. However, several barriers to sustained adoption exist, such as lengthy cooking times, the taste of the cooked food, a limited number of food types that can be cooked, inability to cook in the early morning or at night, the need to cook outside and overall dependence on the weather. Besides using solar energy for cooking, it can also be harnessed for lighting through the use of low cost technologies such as solar lanterns. The benefits of using solar lanterns include the reduction of protection risks for women in common areas inside displacement camps, such as latrines. Furthermore, solar lanterns can allow children to continue reading and studying and can, in some cases, allow business activities to continue after dark. Table 2 shows the performance indicator for interventions which seek to increase access to renewable energy.



In some context, crisis-affected persons depend almost exclusively on wood for cooking. This is the case for Rohingya refugees such as this child handling a woodfuel point of sale.

Livelihood diversification and income-generating activities

Sustainable livelihood diversification and the promotion of alternative income-generating activities help to reduce reliance on unsustainable coping strategies and livelihood activities and to build the resilience of vulnerable populations. If people combine several life-sustaining or income-generating activities in diversified livelihood portfolios, they will be better prepared to absorb shocks and stresses in times of scarcity or crisis.

In the context of energy access, several livelihood activities can be promoted. The production and selling of fuel-efficient stoves, the management of tree nurseries and communal woodlots and the selling of tree seedlings are all potential income-generating activities that can help to improve energy access at the community level. Beyond these activities, the processing, transporting and selling of sustainably sourced biomass has potential to provide a number of people with an alternative income. Providing support to the development of economically, socially and environmentally sustainable Small and Medium Forest Enterprises can help to diversify livelihoods, while at the same time enhancing the supply of sustainable fuel and energy. Furthermore, opportunities for establishing Integrated Food and Energy Systems (IFES) should be explored. IFES combine the production of food and energy on the same land, through agroforestry systems such as multi-cropping systems and systems mixing

annual and perennial crop species (Bogdanski *et al.* 2010). Other forms of IFES seek to maximize synergies between food crops, livestock, fish production and sources of renewable energy. This is achieved by the adoption of agro-industrial technology, such as gasification or anaerobic digestion, which allows for the maximum utilization of all by-products, and encourages recycling and economic utilization of residues. Biogas systems are one example of this kind of IFES and a number of relatively low-cost and portable systems have been promoted in Sub-Saharan Africa, such as the Flexi-Biogas System (IFAD 2012). IFES can contribute to ensuring food security and energy access simultaneously in a climate-smart manner.

Table 3. Performance and impact indicators for the diversification of livelihoods

Expected Results	Indicator	Sub-indicator	Type	Formula	Unit	Source
Increased employment due to local production/ maintenance of fuel-efficient stoves	Employment in fuel-efficient stoves production/ maintenance	# of displaced and local people employed in production/maintenance	Impact	Total # of people from displaced and host communities that are employed in production/ maintenance of fuel-efficient stoves	#	Implementing partner survey
Reduced reliance on selling of woodfuel	Proportion of collected woodfuel used for selling	# of displaced and local people who collect woodfuel for the purpose of selling	Impact	Total number of people from displaced and host communities that sell woodfuel	#	Beneficiary survey
Increased access to cash-based transfer programmes	Cash for stoves	% of households receiving cash for stoves	Performance	(# of households receiving cash for stoves / Total # of targeted households) x 100	%	Implementing partner survey
		Average cash for stoves received per household per month	Performance	Total cash for stoves distributed / Total # of households receiving cash for stoves	#	Implementing partner survey
		% of cash/vouchers spent on purchasing fuel-efficient stoves	Impact	(Total amount of cash/ vouchers spent by targeted households on purchasing fuel-efficient stoves / Total amount of cash/vouchers distributed) x 100	%	Implementing partner survey
	Cash for fuel	% of households receiving cash for fuel	Performance	(# of households receiving cash for fuel / Total # of targeted households) x 100	%	Implementing partner survey
		Average cash for fuel received per households per month	Performance	Total cash for fuel distributed / Total # of households receiving cash for fuel	#	Implementing partner survey
		% of cash/vouchers spent on purchasing fuel	Impact	(Total amount of cash/ vouchers spent by targeted household on purchasing fuel / Total amount of cash/ vouchers distributed) x 100	%	Implementing partner survey

Promoting livelihood diversification and alternative income-generating activities could, however, also lead to shifting power balances and conflicts, e.g. between landowners and pastoralists or between refugees/ IDPs and host communities. Hence, interventions that promote new income-generating initiatives should always adopt a conflict-sensitive approach. Furthermore, the use of cash-based interventions linked to energy access are being currently being scaled up. FAO will seek ways of integrating work on cash-based interventions and SAFE. Table 3 presents indicators for monitoring livelihood diversification activities.



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Population displacements impact the surrounding environment such as the South of Chad where forest lands are being converted to agricultural plots.

Sustainable natural resources and forest management

Environmental degradation and deforestation is caused by a number of drivers including agricultural expansion, shelter needs as well as domestic energy needs. Forest degradation and deforestation represent major challenges to ensuring household access to energy in the context of emergencies and protracted crises (UNHCR 2005). FAO has extensive expertise in promoting reforestation and agroforestry, particularly in the context of improving food security. Sustainable management of forests at the local level can contribute significantly to both food and energy security. However, it is important to adapt such management regimes to the particular, and often challenging, conditions encountered in emergencies and protracted crises. Carefully selected native or appropriate exotic, fast-growing tree species can be considered for the purpose of supplying biomass as well as other products and services. Providing support for the establishment of woodlots together with community forest management training can benefit both local and displaced populations. It is of key importance to include local government and decentralized technical agencies. Locations where large numbers of IDPs and refugees are situated require a context-specific strategy for the management and use of woodlots including a thorough conflict assessment and analysis of policies, and actual implementation at the local level, related to the rights of refugees to move and work freely. The establishment of woodlots or agroforestry systems may provide additional benefits such as livelihood diversification, e.g. planting of fruit trees and producing and selling fuelwood.

The engagement of FAO with government counterparts such as Ministries of Energy, Environment and Agriculture and the Ministry charged with refugees and resettlement issues, as well as their respective local counterparts at the sub-national level should be a key step in initiating reforestation activities. Prior consultations and feasibility studies for establishing community-managed woodlots should be carried out with all stakeholders involved. This process includes the mapping of specific high-potential sites for woodlots and agroforestry. Objections from certain stakeholders, who may not immediately benefit from these actions, should be taken into account and addressed in a transparent manner. In some cases, the provision of necessary equipment and seeds to existing or newly-formed forest committees may be required for the establishment of tree nurseries.

When woodlots mature, harvesting should be based on agreed off-take rates for both local and displaced populations. If a clear felling system is used, it normally takes at least five years before the start of exploitation, compared to a few years in the case of agroforestry activities. Furthermore, opportunities for involving women's groups in these activities should be pursued as the sale of surplus seedlings or the harvesting of fruits can provide them with additional income. Training and awareness-raising are key steps in achieving the objective, especially when unfamiliar tree species or management skills are involved. Trainings should be

Table 4. Performance and Impact indicators for the monitoring of activities to address forest degradation and deforestation

Expected Results	Indicator	Sub-indicator	Type	Formula	Unit	Source
Increased access to fuel supply	Fuel provided	Average # of kg (solid fuel, LPG, gas) or litres (liquid fuel) provided per targeted household per month	Performance	Total # of kg/litres provided to targeted households per month / Total # of targeted households	#	Implementing partner survey
	Agro-forestry systems established	% of host community households which have established agro-forestry systems, providing both food and fuelwood at the same plot of land	Impact	(# of targeted host community households, which self-report to have established agro-forestry systems / Total # of targeted households) x 100	%	Beneficiary survey
	Community woodlots established	# of new communal woodlots established that provide fuelwood for host communities	Impact	# of communal woodlots at end of intervention – # of woodlots at start of intervention	#	Implementing partner survey
Reduced environmental degradation, deforestation and forest degradation	Perception of environmental impact of fuel-efficient stoves	% of households who believe fuel-efficient stoves can reduce pressure on forest resources	Impact	(# of households self-reporting to belief that fuel-efficient stoves reduce pressure on forests / Total # of targeted households) x 100	%	Beneficiary survey
	Afforestation and reforestation	# of hectares of newly planted forest and shrub land	Impact	# of hectares of forest and shrub land in buffer zones at end of intervention – # of hectares of forest and shrub land in buffer zones at start of intervention	#	Analysis of satellite imagery
		% of households receiving training on sustainable forest management	Performance	(# of targeted households which received training in sustainable forest management / Total # of targeted households) x 100	%	Implementing partner survey

developed in a participatory manner, based on prior needs assessments in combination with local knowledge.

The promotion of reforestation activities has the potential to contribute to easing tension or managing conflicts over natural resources, especially those involving host communities, local governments and IDPs/refugees. Appropriate benefit-sharing arrangements should be put in place. In

order to ensure the sustainability of community-managed woodlots and agroforestry activities, it is crucial to address issues of land use and tenure systems. Ownership of land and management of the natural resources on that land are very complex and sensitive issues. Rural communities, urban settlements, local government, landowners, mobile pastoralists, IDPs and refugees should reach agreements on ownership of and access to woodlots and other forested areas.

FAO's Voluntary Guidelines on the Governance of Tenure, which sets out principles and internationally accepted standards for practices for the responsible governance of tenure, can provide useful guidance (FAO 2012b). In addition, FAO's Green Negotiated Territorial Development is a people-centered, process-oriented socio-ecological approach to territorial development, which aims to actively include all actors in territorial development interventions (2016c). Table 4 presents a set of indicators for monitoring SAFE activities aimed at ensuring environmental sustainability.

Disaster Risk Reduction and Climate Change Adaptation/Mitigation

A significant relationship exists between energy access, climate change and the increased frequency and severity of disasters and natural hazards, such as droughts, floods and landslides. On the one hand, natural hazards and climate change contribute to ecosystem degradation and a decrease in the availability of woodfuel and other products derived from natural resources. On the other hand, the unsustainable extraction of woodfuel resources has an impact on climate change.

Unchecked extraction of wood for fuel purposes contributes to environmental degradation and deforestation, and is a source of carbon emissions. Fuelwood collection and charcoal production can place strain on already fragile environments, contributing to soil erosion and increased exposure to natural hazards such as droughts and floods, and to the loss of agricultural livelihoods (FAO 2013f). Reducing disaster risks and enhancing climate change mitigation and adaptation in energy-related interventions requires an integrated approach.

Early Warning and Early Action and Emergency Preparedness Plans should take into account the fuel needs of affected populations and fuels and food utilization technologies should be distributed efficiently in the wake of a natural hazard. Furthermore, effective systems should be in place that provide support to vulnerable populations in their efforts to adapt to climate change.

In crisis settings, where there is a heavy reliance on woodfuel there are at least two ways in which to address the contribution of woodfuel production and use to GHG emissions: (1) Reducing GHG emissions, through the introduction of fuel efficient food utilization technologies such as fuel efficient stoves, fuel-efficient food processing technologies or the promotion of non-wood based fuels (e.g. briquettes, solar energy



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Individuals in the Balukhali Rohingya Settlement (Bangladesh) are developing risks and resources map of their settlement with the delineation of roads for woodfuel collection. This exercise help managing tension and conflict over energy resources between refugee and host communities.



Agricultural seasonal crops change detection in the region of Dusuman (Borno state), Northeast Nigeria.

and biogas) for food utilization, (2) Capturing GHG emissions through reforestation and sustainable forest management practices, which will allow forests to act as carbon sinks. At national level, the Intended Nationally Determined Contributions (INDCs) and the Nationally Determined Contributions (NDCs) have the potential of becoming strong country-level instruments for incorporating energy access issues in national and subnational policies (Bervoets *et al.* 2016). Table 5 presents a proposed performance indicator.

Table 5. Performance indicator for monitoring awareness of the linkages between energy, natural hazards and climate change and impact indicator for black carbon emissions

Expected Results	Indicator	Sub-indicator	Type	Formula	Unit	Source
Increased awareness of links between sustainable energy access and disaster risk reduction	Awareness of links between sustainable energy access and disaster risk reduction	% of households who are aware of the linkages between energy access, natural hazards and climate change	Performance	(# of households self-reporting who are aware of the linkages / Total # of targeted households) x 100	%	Beneficiary survey
Reduced emissions of black carbon	Emissions of black carbon from combustion of solid fuels for cooking	% of households who have measured a reduction in black carbon emissions after switching to a fuel-efficient stove	Impact	(# of households with fuel-efficient stoves who have lower emissions of black carbon compared to baseline / Total # of households with fuel-efficient stoves) X 100	%	Stove emissions tests

Conflict prevention, management and resolution

Access to fuel can be a major source of conflict, especially in emergencies, protracted crises and forced displacement contexts. The use of a conflict-sensitive approach is crucial when considering specific interventions to enhance the supply of fuel and introduce energy-efficient technologies and practices to reduce energy demand. For example, the needs of households from both displaced and hosting communities should be taken into account when designing projects and specific conflict prevention mechanisms can be built into interventions such as the Conflict Early Warning and Response Mechanism. These types of initiatives can help to prevent violent conflict and provide rapid response actions in cases where conflicts over energy escalate. Support to local and inter-communal conflict-resolution institutions such as Joint Community Peace Committees or Local Peace Committees, which can be found in many countries, are another way to address conflict. Women should take on a central role in these reconciliation and confidence-building activities given their role in collecting fuelwood and using traditional biomass to cook meals. A conflict-sensitive approach should be incorporated in energy access mechanisms such as the establishment of joint management structures for communal woodlots, which bring together groups of people who may compete over natural resources, e.g. pastoralists and farmers or host communities and refugees. Furthermore, supporting ways to increase social and human capital will benefit efforts to improve energy access. Bringing different groups together and engaging them in a process of negotiation in order to discuss agreements over access to natural resources, e.g. through FAO's Green Negotiated Territorial Development approach, can support efforts to ensure safe and reliable access to energy. It is crucial to adopt a culturally and conflict-sensitive perspective with respect for existing social values and norms.

Table 6. Impact indicators for monitoring conflict and tension related to energy access

Expected Results	Indicator	Sub-indicator	Type	Formula	Unit	Source
Reduced tension and conflict over energy resources	Tension and conflict over energy resources	# of inter-communal conflict-resolution institutions who take energy access into account	Impact	# of institutions taking energy access into account	#	Beneficiary survey
		% of people involved in conflict prevention and mitigation activities in relation to energy resources	Impact	(# of people involved in conflict prevention and mitigation / Total # of targeted people) x 100	%	Beneficiary survey

Women's work burden, protection and health

Women's work burden in rural areas is situated in three main spheres, namely the productive, reproductive and social sphere. This triple work burden is disproportionate in comparison to the work burden of men who are often paid for their work in the productive sphere and are largely absent from the reproductive roles (FAO 2015d). Women are restricted in opportunities to engage in income-generating activities due to the heavy work load involved in taking care of children and sick or elderly family members and other household work. The essential role of women in food security and nutrition, through their responsibility for providing cooking fuel and preparing food, is linked to energy access. Due to differing household roles, women and men have distinct ways of responding to limited access to energy. Women are often hit the hardest when fuel is lacking, since they are tasked with preparing the food for the family. The time women and girls spend collecting fuelwood has broad implications for their productive life. It weighs on the freedom of choice for women to organize their life and engage in activities they would prefer. A thorough analysis of these multi-faceted and context-specific dynamics could provide valuable insights and support the identification of innovative and gender-transformative solutions. Focusing all efforts on the introduction of new or improved energy technologies will arguably only translate into long-term improvements for women if they are complemented by efforts to initiate transformative processes in gender relations, which have the potential to affect the social tissue of a certain community in a more profound way. Both women and men should be included in these processes, in order to increase the potential for widespread acceptance. Furthermore, the power differences between men and women and their different roles in relation to energy resources are most often not taken into account by policymakers. Despite ample evidence that improved energy access for women tends to lead to higher food and nutrition security, women's limited access to and control over energy resources has still not been adequately addressed. One way of achieving gender-transformative energy policies is through gender mainstreaming. The increased participation of women in the energy sector, e.g. in decision-making fora, can help to improve their status relative to men. Table 7 presents gender-related indicators for SAFE activities.

Table 7. Performance and impact indicators for monitoring gender-related aspects of SAFE interventions

Expected Results	Indicator	Sub-indicator	Type	Formula	Unit	Source
Reduced fuel use as proxy for change in level of exposure to GBV during woodfuel collection	Fuel use	Average # of kg (solid fuel, LPG, gas) or litres (liquid fuel) of fuel used for cooking per targeted households per day	Impact	Total # of kg or litres of fuel used for cooking by targeted household per day / Total # of targeted households	#	Kitchen performance test
Increased saving in households' time spent collecting wood as proxy for change in level of exposure to GBV during woodfuel collection	Frequency and time spent on woodfuel collection	Average # of trips made and average # of hours spent per week on woodfuel collection	Impact	Total # of trips made OR total # of hours spent collecting woodfuel by targeted household per week / Total # of targeted households	#	Beneficiary survey
	Distance travelled for woodfuel collection	Average # of km travelled per week to collect woodfuel	Impact	Total # of km travelled to collect woodfuel by targeted households / Total # of targeted households	#	Beneficiary survey
Reduced indoor air pollution	Perception of indoor air pollution	% of households who believe fuel-efficient stoves reduce emission of smoke	Impact	(# of households self-reporting to observe reduced smoke after using fuel-efficient stoves / Total # of targeted households who received a fuel-efficient stove) x 100	%	Beneficiary survey
Reduced skipping of meals	Skipping of meals	Average # of meals skipped due to lack of cooking fuel by targeted households per week	Impact	Total self-reported # of meals skipped by targeted households per week / Total # of targeted households who received a fuel-efficient stove	#	Beneficiary survey
Increased distribution of portable lights	Distribution of portable lights	% of portable lights distributed	Performance	(# of households receiving portable lights / Total # of targeted households) x 100	%	Implementing partner survey
Increased security and protection due to lighting	Perception of safety and security due to lighting	% of individuals who feel secure at night	Impact	(# of households self-reporting to feel secure at night / Total # of targeted households) x 100	%	Beneficiary survey

Table 8. Performance indicator for monitoring linkages between the water, energy, food and ecosystem sectors

Expected Results	Indicator	Sub-indicator	Type	Formula	Unit	Source
Increased coordination and dialogue between sectors	Coordination and dialogue between sectors	# of inter-sectoral coordination meetings	Performance	(Total # of inter-sectoral coordination meetings / Total # of targeted meetings) x 100	%	Meeting minutes

Multisectoral coordination and dialogue

Energy access in crises and emergencies should not be viewed in isolation. It is intrinsically linked to other issues, such as food security, healthy ecosystems and access to water. Adopting a nexus approach to address the interlinkages between water, food, energy and ecosystems can positively influence the formulation of appropriate and cross-sectoral policies, related to situations of both acute emergencies and protracted crises. Decisions made regarding the use and management of water, energy, food and ecosystems have significant, multifaceted and broad reaching impacts on each other, which often involve a mix of both positive and negative consequences. The full recognition of these linkages is crucial to increase the resilience of the most vulnerable populations. Dialogue and collaboration between sectors need to be enhanced to ensure that synergies and trade-offs are being considered and that safeguards are put into place. Water used for irrigation of agricultural crops and bioenergy resources will promote food and energy production, but will also in some cases reduce river flows and hydropower potential. The production of bioenergy crops under irrigated agriculture will have an impact on energy access, but can also increase overall water withdrawals and threaten food security. Furthermore, a shift has been taking place from an understanding of the exploitation of ecosystems as an unfortunate but necessary cost of development towards the recognition that ecosystems are an integral part of the solution to food, energy and water problems (WWAP 2012). The healthy functioning of ecosystems, which may be threatened in situations of forced displacement and protracted crises, is essential to achieve sustainable water management. Wetlands, for example, are crucial in ensuring the capacity of ecosystems to purify water. Assessments should take these linkages between food, water, energy and ecosystems into account. Table 8 presents a performance indicator related to cross-sectoral coordination.



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Coordination and multisectoral dialogue is key for ensuring a more predictable, timely, and effective response to the fuel and energy needs of crisis-affected populations. This is the aim of the SAFE working group established in Northeast Nigeria.

Framework

The table below summarizes the proposed SAFE Framework by including the indicators and sub-indicators for each of the issues encompassing safe access to fuel and energy for crisis-affected persons defined in the previous sections.

1. Fuel-efficient stoves and fuel-efficient practices	
Indicator	Sub-indicator
Distribution of fuel-efficient stoves	% of targeted households receiving a fuel-efficient stove
	% of distributed fuel-efficient stoves produced locally/internationally
Utilization of fuel-efficient stoves	% of targeted households that use recently distributed fuel-efficient stoves or three stone fire or another cookstove
	# of food vendors inside displacement camps using distributed fuel-efficient stoves
Saving of money for households	Average household expenditure on all fuels for cooking per month
Adoption of fuel-efficient practices	% of targeted households that use fuel-efficient practices
2. Renewable energy and alternative fuels	
Indicator	Sub-indicator
Alternative renewable energy	% of targeted households using alternative fuels
3. Livelihood diversification and income-generating activities	
Indicator	Sub-indicator
Employment in fuel-efficient stoves production or maintenance	# of displaced and local people employed in production or maintenance
Proportion of collected woodfuel used for selling	# of displaced and local people who collect woodfuel for the purpose of selling
Cash for stoves	% of households receiving cash for stoves
	Average cash for stoves received per household per month
	% of cash/vouchers spent on purchasing fuel-efficient stoves
Cash for fuel	% of households receiving cash for fuel
	Average cash for fuel received per household per month
	% of cash/vouchers spent on purchasing fuel
4. Sustainable natural resources and forest management	
Indicator	Sub-indicator
Fuel provided	Average # of kg (solid fuel, LPG, gas) or liters (liquid fuel) provided per targeted household per month
Agro-forestry systems established	% of host community households which have established agro-forestry systems, providing both food and fuelwood at the same plot of land
Community woodlots established	# of new communal woodlots established that provide fuelwood for host communities
Perception of environmental impact of fuel-efficient stoves	% of households who believe fuel-efficient stoves can reduce pressure on forest resources
Afforestation and reforestation	# of hectares of newly planted forest and shrub land
	% of households receiving training on sustainable forest management

5. Disaster Risk Reduction and Climate Change Adaptation/Mitigation	
Indicator	Sub-indicator
Awareness of links between sustainable energy access and disaster risk reduction	% of households who are aware of the linkages between energy access, natural hazards and climate change
Emissions of black carbon from combustion of solid fuels for cooking	% of households who have measured a reduction in black carbon emissions after switching to a fuel-efficient stove
6. Conflict prevention, management and resolution	
Indicator	Sub-indicator
Tension and conflict over energy resources	# of inter-communal conflict-resolution institutions who take energy access into account
	% of people involved in activities on sustaining peace over energy resources
7. Women's work burden, protection and health	
Indicator	Sub-indicator
Kitchen performance test	Average # of kg (solid fuel, LPG, gas) or liters (liquid fuel) of fuel used for cooking per targeted households per day
Frequency and time spent on woodfuel collection	Average # of trips made and average # of hours spent per week on woodfuel collection
Distance travelled for woodfuel collection	Average # of km travelled per week to collect woodfuel
Perception of indoor air pollution	% of households who believe fuel-efficient stoves reduce emission of smoke
Skipping of meals	Average # of meals skipped due to lack of cooking fuel by targeted households per week
Distribution of portable lights	% of portable lights distributed
Perception of safety and security due to lighting	% of individuals who feel secure at night
8. Multi-sectoral coordination and dialogue	
Indicator	Sub-indicator
Coordination and dialogue between sectors	# of inter-sectoral coordination meetings



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Balukhali Refugee Camp, Cox's Bazar, Bangladesh. The burden of collecting fuelwood and preparing meals for the family is primarily shouldered by women and children. It increases their exposure to protection risks when collecting and respiratory problems due to the inhalation of smoke in poorly ventilated spaces.

Tools and methodologies in the field

SAFE assessments

FAO has carried out rapid fuel needs assessments and woodfuel supply and demand assessments in several countries in Sub-Saharan Africa (Chad, Djibouti, Ethiopia, Kenya, Nigeria, Somalia, South Sudan, Uganda) and Southeast Asia (Bangladesh and Myanmar). These assessments can make a significant contribution to the planning of energy-related interventions for crisis-affected populations.

Rapid questionnaires

Assessing the demand for fuelwood, charcoal, other forms of biomass and other categories of renewable energy should start with the end users of energy. Households affected by conflict and natural hazards, including those displaced and their hosting communities, often use a variety of fuels which are either purchased or collected in the area surrounding villages, camps or settlements depending on availability. Households may also employ a variety of cooking technologies that differ in terms of energy efficiency, particle emissions, safety, fuel type, size, materials and cost. The combinations of fuel types and technologies are highly context-specific and require data collection in the field to identify particular needs, challenges and solutions. Short and structured questionnaires for household respondents can be used to gather information on access, availability and consumption of fuels as well as cooking technologies and practices. These questionnaires can also be used to establish a baseline. Quantitative survey questionnaires usually involve the selection of a sample population, since the total population in a village, camp or other settlement is often too large to cover given the time and resources available. The use of structured questionnaires to collect information from households can provide detailed and quantitative socio-economic data such as the size of the household, sources of fuel for cooking, consumption of fuel, expenditure on fuel, cooking technologies and cooking practices. The information drawn from the use of questionnaires can be supplemented by qualitative methods such as semi-structured interviews and PRA techniques, which include focus group discussions and mapping exercises. These methods can elicit more in-depth information and allow respondents greater flexibility in their responses.

Woodfuel supply assessment

The combination of woodfuel supply and energy demand assessment enables to test the hypothesis that progressive, observable, environmental degradation can be related to displacement and suboptimal energy management. Under that hypothesis, future consumption can be projected based on population projection and the potential degradation can be quantified. Woodfuel supply assessment include two components: 1) a small-scale forest inventory and 2) a remote sensing analysis. Through small-scale forest inventories, biophysical parameters of forest and other woodlands are assessed. Field plots are measured in terms of woody

biomass stock (aboveground and litter) using a methodology adapted from standard forest inventory. This assessment can also provide an indication on forest degradation and the use of biomass. The remote sensing analysis includes multi-date, multi-resolution satellite imagery (from 0.3m to 30 m). Image processing is performed combining semi-automatic classification of land cover with change detection processes, as well as using existing global datasets of annual tree cover loss. In some areas of the world, the use of remote sensing is the only method to obtain relevant and consistent data over time due to the limited availability of field data. Satellite data in high spatial resolution can be freely available or available at a reduced cost for emergencies. This data can be used for humanitarian applications, which guarantees a consistent time series, from before and after the installation of the displacement settings, since satellite data has been gathered since the 1970s.

Focus Group Discussions

A Focus Group Discussion (FGD) is designed to capture information about people's beliefs, attitudes and behaviors concerning cooking fuel and related challenges. It uses an open-ended and loosely structured interview format with either questions or topics listed under a number of different topic headings such as food preparation, fuel and cooking technologies, fuelwood collection, use of forests and woodlands, purchase of fuel, livelihood activities and income sources, protection risks, conflict and perspectives for the future.

A SAFE assessment may include questions about protection and GBV. When conducting a focus group discussion on such sensitive topics, it is often preferable to establish groups that are homogeneous with regard to age, sex, ethnicity, etc. At the very least, separate male/female discussions should be held, and adult/youth groups within these considered.

Other forms of Participatory Rural Appraisal

The term Participatory Rural Appraisal (PRA) usually comprises a set of approaches and methods for understanding and assessing the local context and livelihoods of people and social groups within a particular geographical area (Chambers, 2008), such as a camp for displaced people and/or a host community. PRA is usually implemented by following three main steps: (i) selection of a community or village; (ii) a preliminary visit; and (iii) actual application of the PRA (Selener, Endara and Carvajal, 1999). Common PRA techniques include the development of Venn diagrams, seasonal calendars, time use calendars, village/camp timelines and wealth rankings. The use of PRA can generate useful qualitative data on fuel demand and related challenges. Furthermore, PRA approaches place emphasis on empowering local people to assume an active role in analyzing their living conditions, problems and potentials in order to search for a change in their situation

SAFE programmes and projects

The increasing acknowledgement of the crucial need to include energy access in humanitarian appeals and programming as well as in protracted crisis settings has led to the inclusion of SAFE in larger projects and programmes. The sections below present some of FAO's past and ongoing work on SAFE at the country level.

Ethiopia

Supporting the energy needs of refugees and host communities through the establishment of sustainable wood fuel management strategies and plans in Ethiopia (2016 – 2018)

The overall objective of the project is to provide appropriate options for the sustainable management of energy supply and demand to address the energy needs of crisis-affected households in and around refugee camps. The project will provide surveys and mapping of woody biomass resources to ensure a better understanding of their extent and spatial distribution. The project will also assess the woodfuel consumption and energy efficiency of cooking systems in refugee camps. The number of hectares of multi-purposes tree plantations is targeted to increase with more than 50 percent and an estimated 2 200 rural households will be supported with energy efficient technologies.

Kenya

Strengthening linkages between refugee and host communities in Kakuma to improve incomes and nutrition (2015 – 2017)

FAO implemented a project in Kakuma, Northwest Kenya, the aim of which was to raise the incomes of host community households, enhance access to energy for both refugee- and host community households as well as creating economic linkages between the two communities. FAO engaged with host communities to promote the sustainable production of charcoal using improved kilns that reduce impacts of charcoal production on the environment. Another aim of the project was to distribute 8 000 fuel efficient stoves, benefitting both refugees and host populations.

Somalia

Sustainable Charcoal Reduction and Alternative Livelihoods (PROSCAL) (2017 – 2018)

The overall goal of the joint UNDP-FAO-UNEP programme is to promote energy security and more resilient livelihoods through a gradual reduction of unsustainable charcoal production, trade and use. The objectives include the promotion of alternative sources of energy to reduce local charcoal consumption, the provision of alternative livelihoods to Charcoal Value Chain Beneficiaries and reforestation and afforestation activities.

Besides sustainable natural resources management, another important component of the programme is the training of youth and women on metal working, clay molding and stove assembly and marketing. An annual production volume of 30 000 stoves is envisaged.

South Sudan

Emergency Livelihood Support to crisis-affected populations in South Sudan (2014 – 2015)

Through Danish funding, FAO provided direct and time-sensitive support to crisis-affected populations in the form of emergency livelihood kits. Also included in the project was fuel-efficient stove distribution and training to ease the pressure on natural resources as well as to help protect women against the risk of sexual and Gender Based Violence (GBV) associated with the collection of fuelwood. As of 2017, FAO has distributed 30 231 fuel-efficient stoves in camps, improvised settlements and host communities in Bentiu, Malakal, Melut, Nimule, Mingkaman and Lainya.

Emergency Livelihood Response Programme (2015 – 2017)

The outcome of the ELRP is that livelihoods of the most vulnerable people are protected and rehabilitated, by sustainably restoring, and maintaining livelihood production. FAO will upscale the distribution of fuel-efficient stoves to better protect women and girls against the risks associated with collecting fuelwood. Another objective of the programme is to ease pressure on forests and woodlands in IDP settlements, e.g. through promoting coppicing and pollarding for selective collection of fuelwood to mitigate the impact of concentrated demand for fuel.

The Sudan

Livelihood Support for South Sudanese Refugees and the most vulnerable host community members surrounding the camps in White Nile state (2015 – 2017)

The project's overall objective is to save lives, improve food security and strengthen livelihoods among the South Sudanese refugees and the most vulnerable host community members as well as to mitigate the negative impact of woodfuel collection on the environment in the surrounding area of the refugee camps and settlements in White Nile state. Around 1 000 persons (700 women and 300 girls) from the South Sudanese refugee community were trained on production and use of fuel-efficient stoves.

Integrated Food Security and Livelihoods Project (IFSLP) in Eastern Sudan (2015 – 2017)

The specific objective of the project is to ensure food and nutrition security, and reduce the poverty of marginal and small rural households and ex-combatants by boosting agricultural and livestock production, improving natural resource management and enhancing income generating opportunities at the household and community levels

in natural disaster-prone areas of Kassala and Red Sea states. The project includes a number of climate change mitigation activities that include tree plantations, training of households in effective and durable caretaking of the planted seedlings, as well as agro-forestry practices and manufacturing of fuel-efficient stoves by trained women.

Practical tools

FAO Guidance Note on SAFE in protracted crises

In the context of FAO's Strategic Programme 5 on Resilience, a guidance note on meeting fuel and energy needs in protracted crises was developed. It provides an overview of FAO's work on SAFE in protracted crises and explains the multiple links with the CFS Framework for Action for Food Security and Nutrition in Protracted Crises (CFS-FFA).

FAO/UNHCR Technical Handbook on assessing woodfuel supply and demand in displacement settings

The technical handbook presents a multi-sectoral approach for assessing woodfuel supply and demand in displacement settings. Assessment of the sustainability of fuelwood extraction and use is challenging. A major obstacle is the limited availability of basic data. Innovative approaches in data acquisition and analysis contribute to a more inclusive, multi-scalar and multi-temporal perspective. The handbook builds on the Woodfuel Integrated Supply/Demand Overview Mapping (WISDOM) tool, a spatially explicit tool for determining fuelwood priority areas or fuelwood hot spots at national or sub-national scale.

FAO Toolbox on SAFE

The SAFE Toolbox is an Excel-based application, which support the systematic collection and analysis of multi-sectoral field data on energy needs, woodfuel resources and associated risks and challenges faced by people in displacement settings. It has been developed to support field-based actors who are directly involved in the management of natural resources and protection of crisis-affected populations, and it provides guidance for assessing, monitoring and planning energy-related interventions. It is complementary to the methodology presented in the Technical Handbook.

WFP Handbook on SAFE

The handbook was developed to introduce the concepts that underpin SAFE and to guide WFP and other humanitarian actors as they plan and implement SAFE programmes. It is also meant as a tool to sensitize UN

personnel, government officials and NGO staff for them to better take into account these issues, especially when responses are being planned in the early stages of emergencies.

UNHCR Global Strategy for SAFE (2014–2018)

The UNHCR SAFE Strategy strives to promote appropriate household fuel and energy technologies in order to improve the protection and wellbeing of refugees, while at the same time integrating energy requirements into emergency preparedness and response. Furthermore, the strategy aims to increase access to energy for schools, health centres and other institutions, as well as the planting of trees for fuel provision and environmental protection. The framework of the Strategy, including Guiding Principles, Strategic Objectives and Strategic Approaches, guides the development of country specific energy strategies.

IASC Task Force SAFE Tools

Two critical tools were created by the Inter-Agency Standing Committee (IASC) Task Force on SAFE in Humanitarian Settings. First, the Decision Tree Diagram on Factors Affecting the Choice of Fuel Strategy in Humanitarian Settings helps to determine which cooking fuel options will be most appropriate in diverse response settings. Second, the Matrix on Agency Roles and Responsibilities for Ensuring a Coordinated, Multi-Sectoral Fuel Response in Humanitarian Settings answers the question of which agency will be focusing on which fuel-related activity at a certain moment in time.

Mainstreaming SAFE in national policies

There is a strong need for participative processes in formulating policies

The mainstreaming of SAFE in national and sub-national policies presents a way to increase the visibility of energy access issues. Energy policies should pay close attention to the multi-sectoral challenges of energy access in situations of emergencies and protracted crisis. At the same time, energy access should be taken into account in policy-making efforts in different domains:

- Food Security and Nutrition policies
- Climate Change Adaptation and Mitigation-, Disaster Risk Reduction- and Forestry policies
- Policies related to conflict management and sustaining peace
- Policies addressing access to water
- Gender policies

A number of important considerations need to be taken into account. There is a strong need for participative processes in formulating policies. Adapting solutions, such as fuel-efficient stoves and fuel-saving cooking practices, to the local context is therefore crucial. There is a clear need to move beyond the purely technological aspects of stove performance and into the socio-cultural domain. The importance of the national, regional and local contexts, with their specific norms, habits and cooking-related preferences, should feature prominently in SAFE-related policies. Research institutions, including anthropology and other social science departments, may have valuable expertise on these issues. The promotion of innovative and non-traditional partnerships between research institutions, government entities and international organizations will also be beneficial to further research and can inform policies on the context-specific issues related to energy access in emergencies and protracted crises. Furthermore, as different policy domains are most often functionally separated, an integrated approach should be pursued. The sectoral boundaries need to be bridged in a coherent manner in order to avoid fragmentation of responsibilities.

Integrated and cost-effective processes of policy-making, implementation, monitoring and evaluation are required. Within these processes, the broad range of views and expertise available should be incorporated. The promotion of a multi-sectoral dialogue mechanism will support this effort. Achieving strong coordination in mainstreaming SAFE in national and sub-national policies can be achieved through the creation of an enabling policy environment with a clear regulatory framework and consistent laws for all stakeholders. The appointment of a lead ministry or the establishment of an inter-ministerial coordination mechanism is recommended. Policy coordination will also be different in each institutional setting. Finally, efforts of capacity building and institutional strengthening are important to increase the success rate of mainstreaming actions.

Conclusion

This publication has presented an overview of FAO's multidisciplinary approach to SAFE as well as the underlying principles, results and indicators that will guide the implementation, monitoring and evaluation of SAFE programmes. Great effort has been made to design a framework that can be complementary to that of FAO's key partners in the SAFE initiative, including UNHCR and WFP. It is envisaged that this document can serve to enhance and scale up joint programming and resource mobilization among SAFE partners in crisis-affected countries and that it can be used by both field-based actors as well as the staff supporting them in headquarters and regional offices. FAO remains committed to addressing the energy-related challenges of affected populations in an integrated and cross-sectoral way through key partnerships that will allow SAFE programmes to benefit from the comparative advantages of all involved.



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Example of a cooking area in a Turkana host community. Rift Valley, Kenya.

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