FIRE RISK REDUCTION ASSESSMENT OF VULNERABLE DISPLACED SYRIAN POPULATIONS AND HOST COMMUNITY IN LEBANON

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Save the Children

OPERATION FLORIAN
Fire & Rescue Service Humanitarian Charity

Save the Children

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1. Forward

This report is the result of a fire risk reduction consultancy carried out in Lebanon by a team from Operation Florian in July and August 2016. The consultancy was commissioned by Save the Children Lebanon, in collaboration with the Lebanese Civil Defense, in order to make a situation study and needs assessment.

The situation of displaced populations in Lebanon has a long and complex history, with different groups seeking asylum in the country at various stages. However, this report is primarily concerned with Syrian displaced peoples living in Lebanon since the beginning of the crisis in 2012. There is a specific focus on those living in informal settlements and sub-standard buildings, with some reference to those living in urban settings alongside host communities.

The following analysis and recommendations are designed to help key government and humanitarian sector stakeholders to work together to make improvements in all aspects of fire risk reduction.

We believe that the guidance in this report, if followed, will improve the situation of those it concerns. It is our hope that this will lead to better safety, reduced injury and reduced loss of life in fire incidents among displaced Syrians and host community in Lebanon

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Save the Children International

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2. Lebanese Civil Defense

The Lebanese Directorate General of the Civil Defense is a Governmental organization working under the umbrella of the Ministry of Interior and Municipalities.

It was founded 1945 after the Second World War. In 1974, the LCD introduced the first operational unit entrusted with the work of firefighters and rescue ambulances. From there is has continued to work and grow to become a civil defense of today, which has many responsibilities vital to the daily lives of people in Lebanon.

The remit of the LCD covers all matters relating to disasters and accidents caused by natural factors, human negligence or malice. It ensures the protection of property and the environment as well as mitigating dangers to public safety resulting from natural catastrophe and conflict.

3. Save the Children International, Lebanon Country Office

Save the Children has been working in Lebanon since 1953 and transitioned to Save the Children International in 2012. For more than five decades, Save the Children has used rights-based approaches to increase access for children, adolescents and youths to quality education, and to strengthen child participation and protection at the family, school and community levels. Save the Children empowers civil society in Lebanon in times of peace and in times of conflict to respond to the needs of all children.

Since 2013, the Lebanon Country Programme has undergone a massive scale up of its response to the Syria crisis. With more than 1.2 million displaced Syrians having fled to Lebanon, the organisation has grown exponentially to meet the needs of the most vulnerable displaced people in addition to the needs of Lebanese children and Palestinian displaced children. Save the Children now delivers an integrated response and since the start of the crisis has provided over 500,000 beneficiaries with shelter, education, child protection, livelihood and health services.

Together with UN agencies and other INGOs, we work with government departments, including education and social affairs, to help support Lebanon's infrastructure and enable it to better assist the displaced populations and host communities alike.

Save the Children works across all regions of Lebanon. Our humanitarian response currently focuses across the Bekaa Valley, Akkar, including Wadi Khaled, and in Tripoli and surrounding areas. We are also expanding our humanitarian response programs in the South, in Beirut and in Mount Lebanon.

4. Operation Florian

Operation Florian is an international humanitarian charity staffed entirely by professional volunteers from the UK fire and rescue service and academic institutions. The organization has over 20 years of experience developing and supporting fire and emergency services overseas. Operation Florian over the past two years have built up expertise working specifically in refugee camps and informal settlements to evaluate how fire risks can be reduced adopting a holistic approach working with NGOs and communities.

5. Abbreviations

ACTED	Agency for Technical Cooperation and Development
BA	Breathing Apparatus
CSMC	Collective Site Management and Coordination Committee
DRC	Danish Refugee Council
FE	Fire extinguishers
GVC	Gruppo di Volontariato Civile
IAMP	Inter-Agency Mapping Platform
IS	Informal Settlement
LCD	Lebanese Civil Defense
LPG	Liquefied Petroleum Gas
MOSA	Ministry of Social Affairs
NRC	Norwegian Refugee Council
OCHA	Office for the Coordination of Humanitarian Affairs
OCHA ERF	Office for the Coordination of Humanitarian Affairs Emergency Relief Funds
PPE	Personal Protective Equipment
PRL	Palestinian Refugees from Lebanon
PRS	Palestinian Refugees from Syria
PU-AMI	Première Urgence - Aide Médicale Internationale
RAIS	Refugee Assessment Information System
SCI	Save The Children International
SI	Solidarités International
SOP	Standard Operating Procedures
SSB	Sub Standard Buildings
SSU	Sub Standard Units
SCL	Save the Children Lebanon
UN HABITAT	UN Human Settlements Programme
UNDP	UN Development Programme
UNHCR	UN Agency for Refugees
UNIFIL	United Nations Interim Force in Lebanon

6. Executive summary

This report is the result of a fire risk reduction consultancy carried out by a team from Operation Florian in July and August 2016. Save the Children Lebanon commissioned this consultancy. This was in response to a number of significant fires in informal settlements, sub-standard buildings and sub-standard units. These fires have caused health, economic, societal, community and environmental impacts.

This consultancy was carried out in collaboration with the Lebanese Civil Defense, who is responsible for providing firefighting services throughout Lebanon.

Following a desktop review of available data and literature, the team visited Lebanon during July and August of 2016. During this time they met with a full range of key organisations, including NGOs and government bodies. They also and visited a range of informal settlements and sub-standard buildings in the Akker, Bekaa Valley and Mount Lebanon regions.

Based on these visits, interviews and discussions, the following conclusions are presented:

6.1. Findings

6.1.1. Hazard, risk, vulnerability and capacity

The majority of fires occur in tents in informal settlements or within rooms of sub-standard buildings/units. Fires in informal settlements are more frequent and have received greater attention. However, the assessment team also considers sub-standard buildings/units to be at high risk. These require special attention.

There is a low level of fire safety knowledge among displaced populations in Lebanon. The team's qualitative risk assessment concluded that further fires are likely under the present conditions. Vulnerable groups such as children and the elderly are particularly at risk.

Key causes of fires:

- Electrical faults due to poor electrical wiring and illegal connections
- Cooking practices in the home
- Use of candles
- Smoking materials
- Fire setting by children
- Burning of waste
- Acts of arson
- Heating equipment

Rapid fire spread in informal settlements is attributed to:

- Building materials used for the construction of homes
- Density of camp layouts
- Surrounding foliage
- Presence of fire accelerators such flammable gas containers
- Population density
- Weather conditions

6.1.2. Stakeholder and institutional analysis

No nationally coordinated fire policy or standard operating procedures exist for displaced populations in Lebanon. There is potential for improved collaboration between the all actors in the humanitarian sector and the Lebanese Civil Defense. This should include standardising fire event data collection across all stakeholders.

The government prohibition of formal settlements for displaced populations creates some challenges in providing fire safety assistance. Furthermore, despite high levels of commitment among personnel, local fire services are inadequately funded and equipped.

Good initial efforts have been made by the humanitarian sector and Lebanese Civil Defense to tackle fire risk through fire extinguisher distribution and training. However, there is potential for a more holistic approach. This should include community prevention and awareness activities.

6.2. Recommendations

Recommendations are specific to informal settlements, sub-standard buildings and sub-standard units. The following recommendations have been prioritised for immediate attention. Further details on them, and other medium and long-term recommendations, are provided in the report.

6.2.1. Collaboration - coordination - cooperation

- The creation of a national committee on fire risk reduction, co-chaired by the Lebanese Civil Defense and NGOs.
- Implementation of national consultation workshops to share best practice and develop national training materials and resources.
- Lebanese Civil Defense to provide of fire training to NGO agencies, including all staff working in shelter, WASH, protection sectors.
- National adoption of Beqaa Valley Sub-national Fire Working Group guidelines.[1]
- Improved data sharing including across all stakeholders.

6.2.2. Prevention and mitigation

- Best practice advice given for cooking in informal settlements and sub-standard buildings/units.
- Replacement of certain dangerous building materials.
- Creation of a 'scalds and burns' campaign.
- Advice on safer use of candles.
- Handles fitted to doors in sub-standard buildings/units.
- Reduction of time lag in replenishment of fire extinguishers.
- Fire station outreach for children and young people.
- Post-fire intervention work in informal settlements and sub-standard buildings.

6.2.3. Planning and preparedness

- Training for NGO staff, consultants and visitors working in informal settlements and sub-standard buildings.
- Creation of fire points in larger informal settlements.
- Installation of early warning systems.
- Standardisation of fire extinguisher distribution.
- Creation of fire safety awareness programmes, activities and resources for young people.

6.2.4. Response

- Creation of community firefighting teams as first responders.
- Provision of basic firefighting equipment to informal settlements beyond fire extinguishers.

6.2.5. Specific recommendations to improve capacity of Lebanese Civil Defense

- Improved personal safety equipment for firefighters.
- Improved training for firefighters.
- Development of national operating procedures for use of breathing apparatus.
- Utilisation of existing rapid response vehicles for informal settlements fire incidents.

1 See appendix 9

7. Contextual analysis

Over a million displaced people are currently registered in Lebanon - the highest refugee population per capita in the world. This influx has created huge economic, social and infrastructure pressures on the country. Since the beginning of the Syrian conflict the Lebanese Government has prohibited the establishment of formal camp settlements.

As a result displaced populations have settled throughout the country, predominantly in the poorest areas. They live in a range of accommodation settings. These include: informal tented settlements, substandard buildings, collective centres and private apartments in both peri-urban and urban centres.

Consequently, usual humanitarian standards for disaster risk reduction - such as site planning, design, and certain infrastructure provision - are not easily applied in this context. Municipalities vary in the level of support and freedom they grant humanitarian agencies because of the highly politicised nature of refugee settlement in Lebanon. This particularly applies to electrical and infrastructure intervention. The presence of the Syrian displaced population also creates competition for jobs, shelter and access to public services. This can cause friction locally.

It is estimated that up to 70 per cent of Syrian displaced people live under the poverty line. Of these, most rely on aid. Displaced people have limited legal rights in Lebanon.

Displaced population response is led by the Lebanese government and local actors, and supported by the international community. UNHCR is the designated lead agency. A number of different sectors work in collaboration with government ministries and services. This structure brings together 13 UN agencies with 60 NGO partners, both national and international.

7.1. Shelter context

As mentioned above, displaced people live in a range of accommodation. However, informal settlements (IS), sub-standard buildings (SSB) and sub-standard units (SSU) are the focus of this report.

7.1.1. Informal Settlements

Approximately 200,000 displaced people live in IS at present. There are over 2125 active IS sites as of June 2016. These typically range from 1 to 50 tents. IS are generally constructed in an *ad hoc* manner. The Lebanese government prohibits the construction of formal settlements. Assistance in site planning, design or implementing safety standards can be construed as counter to this prohibition. As such there is no formal managing entity for these concerns. The government also restricts the types of shelter materials that can be provided. IS are generally built on private or government land, so structural interventions require approval from landlords and local authorities. These restrictions are a major barrier to agencies attempting to make safety improvements.

Many displaced people move to IS from apartments and SSB once they run out of money for rent.

7.1.2. Sub-Standard Buildings and Units

Approximately 400,000 displaced people live in SSB and SSU. These structures include apartments, garages, worksites, and unfinished buildings. Families may occupy or rent empty, abandoned or unfinished buildings, which are generally concrete skeletons. These often lack doors, windows, roofing, electricity and basic sanitation fittings. SSB are often more exposed to the elements than IS. SSB and SSU house an average of 1.6 families per unit, and are dispersed throughout villages, towns and cities across Lebanon. SSB and SSU are usually harder to reach for humanitarian agencies, and have not been mapped to the same extent as IS.

7.2. Fire risk

Increasing numbers of fire incidents, injuries and fatalities in IS, SSB and SSU are being reported by both humanitarian agencies and the Lebanese Civil Defense (LCD). However, data and reporting mechanisms are inconsistent due to the number of different stakeholders working on refugee response.

The Beqaa regional fire station reported 24 IS fires in the Beqaa region in 2015. 24 IS fires had already been reported in 2016 from January to the beginning of August. The LCD recorded at total of 115 IS fires nationally in 2015. It is, of course, impossible to know the numbers of unreported fire incidents taking place.

Fires in IS have received the most attention amongst humanitarian actors. However, there are high risks and occurrences of fires in SSB and SSU.

Recent fatalities include:

- Two children who died in an IS fire in Beqaa Valley in February 2016.
- An elderly woman who died from severe burns in a tent fire in Masharih-al-Qaa on 1 August 2016.
- A young boy who died in a tent fire on Friday 5th August 2016 in one of the IS in the east of Lebanon.

There are also high rates of injuries: Data from the UNHCR Health department showed that 120 displaced people were admitted with severe burns during 2015. Half of these from fire, half from scalding. Children under the age of five made up half of those injured. As UNHCR only has capacity to treat severe, life-threatening cases, these figures reveal just the tip of the iceberg in terms of fire incidents and injuries.

8. Hazards, Risks and Vulnerabilities

8.1. Hazards

The primary causes of fire in both informal settlements (IS), sub-standard buildings (SSB) and sub-standard units (SSU) are:

- Cooking practices
- Children playing with fire
- Candles
- Heating
- Electrical faults
- Fires caused by deliberate acts
- Burning of waste
- Incidents involving liquefied petroleum gas

Seasonal variability and structural hazards also have an effect on fire risk.

8.1.1. Cooking practices

The Operation Florian team were told that cooking, especially with naked flames, has been a leading cause of fire incidents. IS dwellings are particularly at risk due to the types of construction materials used for these homes, such as plastic, hardboard or cardboard. Cooking oil fires were also reported.

8.1.2. Children

Children are sometimes attracted to playing with fire and items such as lighters. On separate occasions the assessment team saw lighters within easy reach of children, and open fires left unguarded. There were reports of fire extinguishers having been tampered with by children. Another concern is that young girls are often given responsibility for cooking - when unsupervised this presents a fire risk.

8.1.3. Candles

Candles are being used less by refugee households recently due to the availability of solar lights and electricity. However, they are used when there are power shortages, and were given as the cause of several fires. Candles are not always safely used. The assessment team witnessed candles placed directly on televisions, and were informed of incidents where the candle had burnt down and melted into the plastic casing, causing a fire.

Candles are placed close to light materials, such as tent materials, present a risk of fire. A breeze can accidently knock the candle over and the fabric could ignite, spreading the fire. While the use of ashtrays as candleholders was observed in some households, this still poses a risk. Displaced people should be encouraged to use more secure, enclosed candleholders. Empty ghee tins are effective candleholders when filled with sand or soil to hold the candle securely in place. These are readily available since ghee tins are widely distributed in emergency packs.

8.1.4. Heating

The team were not able to see households being heated by diesel heating systems due to the time of year the visit was conducted. However, diesel heaters and wood burning stoves are used in IS and SSB during the winter. If inappropriately placed these are a fire risk, especially with diesel, which is highly flammable.

Some good practices were observed, such as where households placed stoves on metal or stone slabs, and had arranged outlet pipes to avoid touching the wood structure and tent walls. It was reported that, in some cases, waste is burnt in stoves for heat. This can create a potential risk of poisonous fumes.

Firewood for cooking and heating is often stored in close to tents and structures. This also poses a risk.

8.1.5. Electricity

Fires caused by electrical faults were the most common incident reported to the team. Demand for electricity in IS and BBS has caused a lot of informal wiring systems. These create both fire and electrocution risks. Displaced people usually consider the benefits of a home with electrical power to outweigh the risks. Some IS have circuit breakers installed per settlement, either by landlords, NGOs, or privately. Circuit breakers were also observed in IS households, however installation quality varies.

On inspection bare wires, entwined by hand, were commonplace. Wires were also strewn down corridors and between tents. Occasionally they were raised overhead on wooden poles. Homemade junction boxes were protected from the elements with makeshift covers made using plastic bottles. There were few examples of switches; instead wires were usually interlocked to secure a contact.

The Civil Defense explained that, in order to allow the vehicle to navigate through the low wiring in the Sports City suburb, a firefighter would have to mount the roof of the fire vehicle to prop up the overhanging wires with a wooden broom handle.

8.1.6. Fires caused by deliberate acts

Local fire stations staff reported to the team that some fires they had attended were the result of conflicts between refugee families. The exact circumstances are not understood but it is believed fires of a deliberate nature are not uncommon.

8.1.7. Burning waste

Many IS in Lebanon face waste management challenges. On certain sites displaced people burn their household waste, often very close to tents and buildings. These fires can get out of control and spread into dwelling areas. This can be caused by weather conditions or lack of supervision.

On each IS site visit, the team witnessed evidence of waste burning in waste disposal areas and at other locations on site.

8.1.8. Incidents involving liquefied petroleum gas (LPG)

The team saw LPG cylinders re-painted in non-regulation colours, rusty and dented cylinders, perished hoses, hoses attached with homemade restraints, broken ovens and blocked burners. Gas leaks resulting in fires were reported. Displaced people interviewed by the team did not know what to do in the event of a gas leak or when smelling gas.

8.1.9. Seasonal / time variability

A lack of data means that it is difficult to comment on seasonal variability. Anecdotally, households, agencies and fire responders reported no seasonal variability in the number of fires, only that different seasons presented different risks: Winter fires were caused by heating practices and electrical wires exposed to rain. Summer fires were caused by discarded cigarettes, dry materials and electric wires melting.

Most fires were reported to have taken place during the day.

8.1.10. Structural hazards

Fires spread through IS very quickly. There are reports of tents catching fire and being burnt down within seconds. The materials with which tents are built - wooden frames, plastic, cardboard and hardboard sheeting - are high fire loading.[2] In all IS visited, a large number of tents had tyres placed on the top of them to weigh the tents down. It was suggested during interviews that tyres were used because they could be obtained for free. However, tyres provide a fire additional fire loading and fuel. Despite advice given to the contrary, many displaced people were still using tyres in this way.

2 Fire loading refers to heat output per unit floor area. It is used to assess hypothetical fire risk.

The high density of many IS, with tents only centimetres from one another, enables fires to spread very rapidly. This is exacerbated by the presence of fire accelerators, congestion, prevailing winds and a dry environment in the summer months. There is a need for strategies that help displaced communities to respond appropriately and quickly. Fire spread is often too rapid to be controlled in time by formal and external responses such as the LCD.

Doors in SSB are often ether missing or poorly fitted. Some doors that had been provided through NGO support were of poor quality, made of plastic and already broken. Doors are a significant barrier to fire spread. The lack of good quality doors increases fire hazard and vulnerability.

Observed household practices during the SSB rehabilitation phase were also concerning, particularly hoarding of household furniture and belongings in one room while other rooms were rehabilitated, presenting a high fire loading risk.

Unlabelled mattresses and furniture were identified in both IS and SSB. It is therefore unknown whether these are made from flame retardant materials. While it is not possible to monitor all materials, oversight of those provided by humanitarian agencies is necessary.

8.2. Risks, Likelihood and Impacts

8.2.1. Risk analysis: likelihood of fire and fire fatalities

Risk analysis is hindered by the current lack of coordinated fire data, detailing the number and circumstances of fires within the refugee population. This makes quantifiable risk assessments difficult.

However, there is some data available from the Lebanese Civil Defense (LCD). This indicates that they attended 115 fires in IS in 2015. Naturally this gives no indication of the number of unreported fires.
While in Lebanon, the team were notified of two further separate incidents of fire where fatalities had occurred.

Below are some of the fire incidents reported local media in 2016:

5 August 2016	A two year old Syrian boy died in a fire.
1 August 2016	An elderly Syrian woman dies in a shelter tent blaze in Qaa
26 July 2016	A sub-standard building fire in Bireh Akkar. A Syrian family of five were living in the structure. No casualties reported.
24 July 2016	A big fire broke out in a Syrian displaced population camp in Al-Beqaa.
2 July 2016	A fire broke out in an informal settlment at the town of Taanyel, Beqaa. More than ten tents caught fire. Three people injured.

Data from Save the Children's Monitoring Report for 2016 details 22 fires in IS reported directly to them.

Of these, 82 per cent were reportedly caused by electricity, although the process of investigating these fires is unknown. According to this data, there were a total of three fatalities in two separate fires. 55 tents were totally or partially destroyed as a result of those 22 incidents.

The number of damaged homes equates to 2.5 households requiring assistance per fire. The cost of a shelter kit to assist re-building a household is $240. It would cost $13,200 in shelter materials for these 55 households. This figure excludes mattresses, blankets and cooking equipment that are also often provided.

Fires are reported to NGOs who then provide shelter assistance, so it is in the beneficiary's interest to report post-fire damage and therefore most incidents are likely to have been disclosed. Three fires a month are reported to Save The Children on average. Extrapolating from the limited available data, this would indicate around five fatalities from fire incidents per year.

Sites that have repeated fire incidents are particularly concerning. Repeated gas leaks at site 003, for example, demonstrates that post-incident response has not been effective. The data from the LCD's records of 2015 also suggests repeated fires on certain sites. This cannot be confirmed as the LCD records do not use the P-code location system[3] preferred by humanitarian agencies.

There was no data presented to Operation Florian on SSB fires. However, on inspection, it became clear to the team that SSB present different fire risks to IS. SSB arguably present a higher risk of fire fatalities because of limited means of escape. Single storey, simple layout tents are far easier to escape from than multi-storey apartment buildings with only one stairway. Buildings of multiple occupation, particularly in medium to high rise structures, place occupants at risk from the potential poor fire safety practice of other occupants.

Comparing fire statistics between the refugee population and in country population is not possible due to the lack of data on both refugee and general populations.

8.2.2. Risk analysis: non-fatal consequences

Individuals may suffer smoke inhalation, which requires medical treatment. Non-fatal burns and scald injuries were observed and reported, although again data is lacking. Burn injuries require immediate intervention and the majority of displaced people who were asked did not know how to treat burns. Many reported using toothpaste rather than water to cool burns. This practice is ineffective.

Psychological trauma following fire incidents was also observed.

Fires have resulted in the partial or full destruction of homes and possessions, including important documentation related to refugee status. Destruction of educational material and equipment related to livelihoods also has long-term implications for displaced population wellbeing. In the short term, households are temporarily rehoused, or move in with neighbours, while tents are reconstructed. This causes insecurity and overcrowding.

Fire increases tensions between households due to a lack of social cohesion in some communities.

3 P-codes are geographic location codes. They are a series of numbers and letters that give a precise location

There are reports of households accusing others of arson to claim new tents. Arguments are also reported to take place over the fault and cause of fires.[4]

8.3. Vulnerability

The Vulnerability Assessment Framework used in Lebanon by the NGOs and the UN "…improves upon that practice of prioritizing the most vulnerable beneficiaries by providing a comprehensive and collaborative data-driven system that features more in-depth collection of household information, and standardized definitions and benchmarks for determining vulnerability levels within different sectors."

The Refugee Assessment Information System (RAIS) is used to record this data. However, it contains few of the questions that assist in identifying common vulnerabilities to fire.

Typically, the most vulnerable are those who fall into the following categories. (The more categories an individual is in, the more likely they are to die in a fire)

- Elderly (over 65).
- Lone living (particularly males).
- Mobility issues (especially those unable to escape fire without assistance) – this is compounded by the dense layout of IS, lack of escape routes and by the condition of stairways and access ways in SSB and SSU.
- Mental health, particularly dementia (e.g. leaving cooking unattended).
- Abusers of drugs or medication.
- Abusers of Alcohol.
- Unsupervised infants in tents
- Smokers - a high incidence of smoking was observed, with unsafe disposal practices, and easy availability (and lack of risk perception) of lighters to young children.
- Hoarding (resulting in heavy fire loading). This was observed to be a particular issue in SSB.
- Children. A high number of refugee children and young people are not attending school. This means they spend more time at home during the day with more opportunities for playing with fire. Young girls are also particularly vulnerable due to their household responsibilities, which often include cooking.

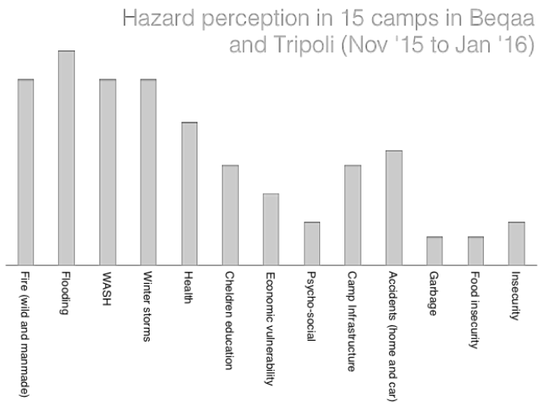
A number of questions could be included in the RAIS questionnaire to identify persons who fall into these categories. Households identified with individuals in many or all these categories need to be considered very high risk.

There is higher vulnerability for smaller IS, specifically those of under 20 tents. The team visited Arqa 0017, a small IS of just two tents, which had suffered a tent fire. This IS had received no fire extinguishers (FE), training or support prior to the fire. These settlements are neglected in current FE training and distribution, and are often physically isolated. Fire occurrence is lower in these settlements, due to lack of density, fewer electrical connections and so on. However, when fires do occur these groups are extremely vulnerable.

4 For analytical risk assessment forms for IS and SSBs, please see Appendices 4 and 5.

8.4. Risk Perception

All displaced people interviewed expressed concerns about fire, even those from households that had not experienced previous fire incidents. Some held that view that *"it is God's will"*. Some agencies reported that fire risk is generally perceived as being low priority among displaced people, as reflected in the lack of actions taken to reduce risk. There is now an opportunity to focus on fire risk reduction as a priority for the displaced population as the situation moves into a post-emergency and stabilisation phase.



The Lebanese Red Cross is the only agency to have made a formal assessment of risk perceptions. The Hazard Vulnerability and Capacity Assessments conducted by the Lebanese Red Cross Disaster Management Unit revealed that across fifteen camps, fire was perceived by the local population, to be the joint second most concerning hazard after flooding. Reportedly even higher priority than health and child education. This provides evidence and a good opportunity to work more closely with communities on improving fire safety awareness and fire response.

8.5. Capacity Assessment

The team tested displaced people on their likely actions and knowledge in the event of a fire. In both IS and SSB, those asked generally did not know the number to call for the fire service, or how to treat a burn. There was a general lack of knowledge about how to react to smoke, the smell of gas or an actual fire. This lack of knowledge makes them far more vulnerable to fire.

Furthermore, if no one is able to raise the only household/focal point with the equipment and knowledge to extinguish a large fire, then response times will not be quick enough to make a difference.

9. Policy and institutional response analysis

The following section provides an overview and analysis of the relevant policy, institutional context and current delivery mechanisms of key stakeholders.

9.1. Policy context

The Lebanese Civil Defense (LCD) is mandated to provide fire protection to all those living in Lebanon. However, there is no specific contingency planning or standard operating procedures (SOP) for dealing with fire risk in displaced populations.

At a national level, building codes and regulations that include fire safety measures are in place. However, these are not standardised or adequately enforced. No law mandates the teaching of fire safety at any level. It is up to individuals and organisations to educate themselves on their own initiative. As a result, few fire safety measures are observed in homes and businesses. This is carried over, to some extent, into the humanitarian agencies operating in this context. There is a notable lack of fire safety policies mainstreamed into shelter rehabilitation projects, and a lack of awareness among shelter field staff overseeing such projects.

Efforts by humanitarian agencies are hindered by government restrictions on formal settlements. This is discussed above, in section 7.1.1.

Across the humanitarian sector there is no nationally coordinated policy or SOP on fire safety in displaced people's accommodation. Each implementing agency tends to apply their own, varying standards and policies. Sub-national efforts are currently being made in the Beqaa region, which has the highest number of IS. Attempts to coordinate a national strategy are ongoing.

9.2. Institutional context

9.2.1. Lebanese Civil Defense

The following review of the Lebanese Civil Defense's (LCD) fire risk responsibilities and capacity is based on meetings, interviews and observations from the two-week field visit. It focuses on response capacity for urban fires and fires in IS. This is not a comprehensive analysis, which would require further review. This is something that Operation Florian could provide in the future.

Mainstream responsibility at the national level for fire risk lies with the LCD, which is funded and administered by the Ministry of Interior and Municipalities. There are approximately 220 fire stations nationally.[5] These are comprised of joint fire and ambulance fire stations, dedicated fire stations, coastal sea rescue and sea rescue joint ambulance units. These stations are manned by approximately 2000 firefighters, predominantly volunteers.

The LCD is responsible for the provision of staff, equipment and training. It is mandated to provide fire safety advice, and develop and deliver public safety information. However this is on a request basis only. This is a mandatory responsibility within their legislative functions. The LCD also serves as the public emergency medical service, carrying out patient transportation. This is done with with the Lebanese Red Cross and other first response/pre-medical organisations in the country.

5 See appendix 3

9.2.1.1. LCD Staffing

LCD operational personnel are made up of a combination of professionals and volunteers, with the majority working as volunteers. Since volunteers usually work in other employment alongside volunteering, they are susceptible to fatigue. This presents a health and safety issue. Volunteer personnel have been engaged in ongoing struggles to secure payment and professional recognition of their work.

Conversations with LCD personnel revealed high levels of personal commitment to the job, with firefighters eager to take advantage of training opportunities, information and resources. However, this commitment can be undermined by the lack of financial remuneration and wider support for their work.

9.2.1.2. LCD Personal Protective Equipment (PPE)

PPE refers to fire tunics, fire leggings, helmets, boots, gloves and flash hoods. On inspection there was an insufficient amount of personal protective equipment for firefighters. Often it is shared among firefighters, or is of the wrong size. PPE that was present was in poor condition. This raises concerns as to the effectiveness of PPE. In some cases, volunteers have had to purchase their own PPE, and could not afford full sets or could only buy pieces that were of insufficient quality.

9.2.1.3. LCD breathing apparatus equipment

On inspection there was an insufficient amount of breathing apparatus equipment for firefighters. It was acknowledged at stations where the Technical Rescue Vehicles were located there were at least 4 Drager 200 BAR Breathing Apparatus sets.

However, the age and condition of breathing apparatus sets elsewhere were unsatisfactory. Breathing apparatus provides important respiratory protection for firefighters when attending fires. In the short term, it improves their effectiveness to carry out rescues and extinguish the fire, reducing risk to personal health. In the long term, there are significant benefits for the health of firefighters. Breathing apparatus reduces long-term illnesses by preventing the inhalation of carcinogenic fumes and toxins that, over time, will harm a firefighter's respiratory system. It is therefore recommended that breathing apparatus sets are upgraded, and that more sets are made available for firefighters.

9.2.1.4. LCD Training facilities

The Civil Defense has no training facilities that would be considered suitable for breathing apparatus training. There is a need for a national training centre that can facilitate fire development and hot fire training facilities.

There is a multi-rig training facility, owned by UNIFIL, in the south of the country. The team was glad to see that training had been delivered to LCD staff at these facilities. However, this appeared to be a one off, and did not provide sufficient time or depth to the training to meet standards required for a national fire service.

Staff reported using the Internet for research on fire development, flashover and backdraft, and suggested building similar facilities from plans found online. There are major construction and health and safety risks associated with the development and use of facilities in this way.

Another risk is the quality of training that can be provided to volunteers with limited time. Again, volunteer firefighters reported seeking out training and knowledge online. This has tremendous health and safety implications for volunteers who may be placing themselves at risk to save lives. This will result insufficient training to deal with significant risk at fires and specialist rescues. While political constraints to providing more professional firefighting staff are recognised, it is still vital that numbers of professional firefighting personnel increases. This will be benificial to the safety of communities as well as improve safety and welfare for firefighters.

9.2.1.5. LCD Firefighting vehicles

It is understood that the main fleet of vehicles owned by the LCD is made up of large water tankers. This is necessary because of insufficient water supplies in both urban and rural settings. However, due to their size and weight, they provide slow response times. There are no hydrants so all water has to be carried in tankers. The limited tank capacity of fire trucks means that sometimes trucks have to leave fires to refill.

Access to many IS are limited due to poor roads or sites on agricultural land which require off-road vehicles to access. However, the expense of such vehicles is usually prohibitive for the LCD.

In some regions there are vehicles that do have some off-road capacity. The team observed 4 x 4 trucks donated by the Italian Government, and specialist forest firefighting vehicles donated by France. It is recommended that these vehicles are serviced and made available for attending fires in IS.

9.2.1.6. Role of the LCD in fire risk reduction

The LCD undertakes limited community prevention and training work nationally, with up to 30,000 people reached each year. Businesses and organisations that wish to receive training are required to make requests via the LCD headquarters in Beirut. The LCD is not legally required to carry out fire safety checks on buildings, again this happens at the request of the building owner. Fire safety does not currently feature in the national school curriculum, however fire safety educational materials have been produced and attempts to disseminate these nationally are ongoing. Post-fire interventions are also limited. Post-fire investigations only take place when requested by the police. No post-fire support or safety advice is provided due to capacity issues.

9.2.1.7. LCD response to fire risk in the displaced population context

There is a recommended national response time commitment of 30 minutes. However, among displaced populations it was reported that the LCD is often slow to respond to fires, especially in IS.

Locating fires is one of the biggest challenges for the LCD when responding to IS fires. The LCD, both nationally and locally, has no reference points for settlements. The LCD does not use P-codes, as mentioned above in section 8.2.1. The team's field visit was the first time P-Codes had been encountered by the LCD. They are often given imprecise details of IS location due to their informal nature. This means the LCD have to rely on looking out for smoke to identify fires, stopping to ask members of the public and calling back to the station to check details. The difficulty in locating IS fires was experienced by the Operation Florian team during a field visit to Beqaa regional fire station, where a call out to an IS fire had to be abandoned as the LCD crew was unable to locate the fire.

SSB present similar challenges: Most SSB do not have any form of P-code or known address. Local landmarks or buildings are being used as navigational reference markers to direct responding fire crews. Worryingly, in some situations where an SSB that caught fire, the LCD were not called out at all and the firefighting was undertaken by the residents and landlords.

Response times are also delayed by the way emergency calls are routed. Mobile phone calls are often routed through Beirut and then transferred to local fire stations. This means that location details can easily be lost. However, local station telephone numbers are available. These numbers transfer directly to the nearest station.

The under-resourcing and associated capacity challenges of the LCD mean that increasing numbers of IS fires are putting strain on firefighting services. In Beqaa, it was reported that the demands of fires in IS meant personnel were unable to attend to other incidents, and vice versa, This is particularly problematic during winter, when extreme weather places heavy demands on firefighting services. This confirms the need for a more coordinated emphasis on prevention at the community level.

9.2.1.8. Coordination between LCD and humanitarian sector

Currently there is very limited coordination between the LCD and the humanitarian sector. The LCD has provided some fire safety training to NGOs at the national training centre in Beirut, however the scope of training was limited to fire extinguisher use ahead of distribution and causes of fires. This was not tailored to the specific context, which is a missed opportunity in terms of knowledge exchange.

There has been some concern within the LCD over the lack of joint working on the issue of displaced population fire risk. All levels of LCD reported bring unaware of humanitarian interventions and plans. In some cases this has caused a lack of understanding by LCD personnel of the conditions and realities experienced by those living in IS, and how these conditions create fire risk. However, conversations at all levels, from Director General to volunteer firefighters, revealed great willingness and desire to work with the humanitarian sector to share knowledge and streamline procedures to improve fire response.

LCD staff have first-hand experiences of the devastating effects of fires in IS, and the frustrations experienced in not being able to locate fires. This underpins this strong desire to work together to tackle the problem. The assessment team were impressed with the professionalism and commitment displayed by all firefighters.

9.2.2. Government institutions

As part of the humanitarian response, government ministries provide guidelines and instructions to municipalities for the support of displaced populations. Municipalities are not mandated to follow these, and there are no sanctions or follow up on implementation. This has caused uneven support for IS, particularly infrastructural support. Such support would reduce fire risk. In some cases local municipalities and Ministry offices have provided a post-fire response. For example, one case of fire in Minieh 022, in which local Ministry of Social Affairs office coordinated response with UNHCR. However this was not a standard response, and also led to confusion about roles and responsibilities between international agencies and local NGOs regarding rebuilding.

9.2.3. Humanitarian sector

Through inter-agency coordination, nine sectors have been established:

- Basic Assistance
- Protection/CSMCs
- Education
- Energy and Water
- Food Security
- Health
- Information Management
- Livelihoods
- Shelter

Responsibility for fire risk in the humanitarian sector is not clearly defined under one of the above. In practice, the shelter and CSMC sectors have taken initiative on working on these issues, but certain responsibilities also lie with the protection, WASH and education sectors. While representatives are sometimes invited to join working group meetings in other sectors, there is little coordination on issues of fire.

In individual implementing agencies responsibility varies. For example, some fire safety initiatives are coordinated through shelter, but in the North this is coordinated through CSMC and WASH, who are responsible for electrical cabling. This highlights the importance for humanitarian actors to work on fire as a cross cutting issue, but demonstrates coordination between the different sectors.

9.2.3.1. Humanitarian sector - shelter

The Shelter sector operates through a working group coordinated by UNHCR. It is made up of 26 NGOs, implementing agencies, other UN agencies, Ministry of Social Affairs Representative, and donors.

The core group is made up of:

- Save The Children International (SCI)
- Norwegian Refugee Council (NRC)
- Medair
- Danish Refugee Council (DRC)
- UNHCR
- The Lebanese Ministry of Social Affairs (MoSA)

This core group decides strategic direction, and guidelines of intervention. The shelter sector has taken steps to collect and share information, and coordinate responses to fire safety issues. Specific activities have included UNHCR funding of fire extinguisher (FE) distribution and training to a number of NGOs (however with minimal guidance or standards on implementation). The group also acts as a focal point for reporting. However, reporting procedures are not clear, there is no standard reporting template and information does not appear to be consistently shared between local, regional and national levels.

Shelter actors in Beqaa region have formed a sub-national fire committee to take steps to streamline fire safety across implementing agencies. A draft set of minimum guidelines has been drawn up with input from different agencies. This is a positive step, and confirmed by stakeholders as the appropriate way to push through wider coordination from a regional to national level. However, at the moment the LCD is not involved with process. It is vital that the LCD become involved as it is a key stakeholder.

Specific activities implemented by shelter implementing agencies are detailed below in section 9.3.

9.2.3.2. Humanitarian sector - health

The UNHCR health sector gathers statistics on burns injuries, but only those that require lifesaving treatment. Attempts have been made to work on injury prevention and household safety communication through posters and visual materials. These attempts are not perceived as effective. This is possibly due to displaced people being overloaded with information and other priorities. Audio-visual material on burns prevention is currently being produced and will be distributed through social media.

The health sector does not currently coordinate with other sectors, such as shelter, CSMCs/protection or education, on prevention measures. There is potential here to streamline safety and prevention work in order to not overwhelm displaced people with information from different sources This will also help to make sure that information given is consistent.

9.2.3.3. Humanitarian sector - protection/CSMC

A number of local committees have been established by humanitarian agencies to respond to specific needs in IS. Committees have been trained to respond to needs in coordination with local leaders, host communities and humanitarian actors. They have a vital role in promoting self-resilience and personal safety. However, it is difficult to maintain these committees, particularly in cases of transient populations.

In the North, fire safety has been coordinated through Collective Site Management Committees (CSMC) established by NRC. The new minimum standards for the Beqaa region recommend CSMCs as a key entry points for fire safety activities. However, less than 25 per cent of IS are currently supported by a CSMC agency. In Beqaa there is a push to establish more CSMCs, but in some areas they are politically sensitive issue due to their perceived role in the formalisation of camp structures.

9.2.3.4. Humanitarian sector - WASH

The WASH sector covers areas related to fire risk such as water capacity, solid waste management and electricity sources due to its coordination with the Ministry of Water and Energy. In the North of Lebanon, WASH is involved with fire safety activities. However, elsewhere WASH does not yet have a key role in fire safety coordination work.

9.2.3.5. Humanitarian sector - inter-agency coordination

There is humanitarian coordination in some issues, such as interagency household profiling, vulnerability assessments and mapping through the Inter Agency Mapping Platform (IAMP). The IAMP serves as a common baseline for activity planning, gap identification, assessments, monitoring and coordination. However, there is a lack of coordinated attention on fire safety.

The IAMP is a potentially useful resource for fire risk analysis: For example, household profiling involves data collection on methods of household waste disposal, physical dangers, electrical sources, cooking and heating practices. All of this could be used to analyse information from a fire risk perspective. The IAMP has the capacity to add new questions and record new forms of data.

Each NGO collects data on fire incidents independently and in different formats. Often fire data is not disaggregated from other types of data. The type of data that is collected is also inconsistent and incomplete. This is because few NGOs have templates to use. The way in which data is shared between NGOs is also unclear and needs to be addressed urgently.

Referrals are shared between agencies, and these may contain incidences of fire. However, specific data collected in this way is not extracted or analysed, nor is this shared with the LCD. There is huge potential here especially in terms of sharing technology and information for assisting the LCD to locate settlements.

9.2.3.6. Humanitarian sector - commitment

There is a high level of commitment among humanitarian partners to strengthen work on fire prevention and response, particularly as the response phase moves

from emergency to stabilisation. From conversations it was clear that there is a great desire to coordinate resources, experiences and knowledge. The Beqaa sub-national fire committee has made significant progress in bringing together partners and their draft minimum standards provide a valuable starting point for wider coordination.

9.3. Fire risk reduction activities to date

The main fire risk reduction roles of implementing agencies are to support refugees and landowners through prevention, mitigation and recovery activities. The core activities have been fire extinguisher (FE) distribution and FE training in IS. This has coordinated through UNHCR, although there has been only minimal guidance from them.

There is a lack of knowledge about the structure and capacity of the LCD among implementing agencies. Selected staff from NGOs had received training from the LCD in Beirut. However, most field staff have little understanding of, or training on, fire issues.

Perception of risk among implementing agencies also varies. Most agencies identified IS as the most vulnerable sites for fire risk due to their informal nature, materials and everyday practices of cooking, heating etc. SSB and SSU were not generally considered as particularly vulnerable. However the hazard, vulnerability and capacity profiles from site visits to SSB and SSU show a high level of risk.

UNHCR and Medair are also in the process of piloting a fire safe stove and electricity insulation kit project.

9.3.1. Fire extinguisher distribution in IS

Since 2015, UNHCR has funded the distribution of dry powder FE through implementing agencies to IS throughout Lebanon. Some implementing agencies that are not funded by UNHCR have also been able to distribute FE and FE training. One such example is the Norwegian Refugee Council (NRC) who received funding from Office for the Coordination of Humanitarian Affairs (OCHA) Emergency Relief Funding programme. UNHCR has provided limited guidelines on distribution modalities: One FE per four tents, and only in IS made up for more than 20 tents. Lack of provision for smaller IS is concerning. Small IS that were visited were highly vulnerable to fire risk. Some of these had experiences fire incidents.

Other agencies not part of the formal, coordinated humanitarian response, such as the Red Cross and Qatari Red Crescent, are also reported to distribute FE independently. This raises coordination concerns.

The distribution process generally begins with contact with the settlement shaweesh, focal point, CSMC or Community WASH Committee (CWC) if one exists. This is initially to identify where FE should be placed. Beyond the ratio of one FE to every four tents, most agencies take a risk-based approach to the placement of FE, considering accessibility by surrounding tents:

- Solidarités International distributes two FE per CWC, but also allocates more FE to sites with narrow passages between tents, and sites where tents are far away from each other.
- NRC distributes one to every five tents.
- Medair distributes one to every three or four tents, taking into account the location of elderly people or people with disabilities.
- Save the Children International (SCI) distribute one FE to every four tents.

Generally, FE are placed inside tents, however problems have been reported by Medair regarding accessibility. This is especially a problem at night or during the day when residents are away from the tent, sometimes locking them. Displaced people can often feel uncomfortable entering tents which are not their own. NRC reports that people generally know where FE are located and can call on one another to use them in the event of a fire.

Agencies such as Gruppo di Volontariato Civile (GVC) use focal points to oversee the locations of FE. It was observed during a Medair FE distribution session that some residents were unhappy with the ratio and placement of FE, asking for one per household. According to the G4S assessment, previous distribution phases were amended to give one FE per household, but this is resource intensive and perhaps not sustainable in the long run. Another reported trend was that households will give the FE to a shaweesh for safekeeping, either voluntarily while going out to work, or they are coerced by the shaweesh to do so. In some cases it was reported that FE are usually given to men as *'they usually deal with fires'*. However, most fires appear to take place during the day when fewer men are around, having gone out to work. Therefore it is vital that other household members also be targeted in distribution and training. There is some awareness of this, and agencies such as the Norwegian Refugee Council (NRC) and SCI have attempted to target women in multiple trainings. During Medair FE distribution observed by the Operation Florian team, women were also encouraged to come forward to receive FE and training.

In terms of refilling, UNHCR and some individual agencies have been able to fund the refilling of used or expired FE. This is conducted by SCI, NRC and Première Urgence - Aide Médicale Internationale (PU-AMI). These agencies ether distribute hotline numbers for the replacement of used or malfunctioning FE, or committees will record and notify the agency directly (NRC). Some agencies keep data on expiry dates and distribution, and carry out random monitoring visits to check on FE. However, agency-lead refilling is resource intensive and not sustainable in the long run. Therefore UNHCR and others are pushing for the IS themselves, through committees and focal points, to take responsibility for refilling and maintenance.

This transition will require continued, ongoing engagement through training; not all residents realise that FE must be refilled after being discharged. In many cases where FE had been discharged, people would keep hold of the FE in the belief they could use it again.[6] This highlights shortcomings in training. The cost of refilling ($10 to $15) is perhaps an additional barrier, as is locating refilling station. NRC Post-Distribution Monitoring (PDM) showed that no FE had been refilled by residents themselves. This was due to not knowing they needed to, not knowing where to go to refill, or the refill station being too far away. Medair designates a fire safety leader responsible for filling and servicing FE, however this is substantial responsibility for one person or group in more sizeable settlements. This system could potentially cause financial issues between residents.

During the fire at IS Taanayel 001 it was reported to Medair staff that a large number of FE did not operate. MEDAIR are in the process of forensically analysing why such failures occurred and are awaiting the results. It is highly unusual for FE to fail in such a way. This is not to suggest there has not been some form of mechanical failure. However, if FE are discharged and not refilled they will not operate correctly. As mentioned above, there is also the possibility of user failure.

6 Irrespective of whether all or some of the contents of a FE is used once a discharge has occurred it has to be refilled as the stored pressure within the FE container becomes depleted and within 24 hours the FE is unusable.

SCI reported that in the emergency phase, 60 per cent of FE were being sold, but they are now seeing a trend of them being kept. NRC backs this up: In their PDM of fire safety, 87 per cent of FE remain in sites sampled. However, Medair report that missing FE are still a problem – residents sell them or take them with them when they leave a settlement, and some do not want to give them back for refilling, for fear that they will not receive another one. This again points to a need for greater emphasis on the importance of FE during training/fire safety sessions, and sharing of best practice between implementing agencies to understand under what conditions displaced people are keeping FE.

There were examples of FE being successfully used from across all agencies. However, there was also quite a high rate of misuse. SCI reported out of 1000 distributed FE in 2015, 250 were misused. There were reported cases of FE being empty or broken when needed. A batch of defective FE was replaced by SCI in 2015, however it appears that tampering on a day-to-day basis, and inappropriate use during fire incidents, is widespread. There were several first-hand reports of FE not working properly. This may be due to users having not attended training sessions first-hand, or the fact that in some cases FE have been used when the fire is already too big and has spread. Other fire suppression techniques such as sand/water may be more appropriate in such situations. Training is the key to correct FE usage. This is explored further in the next section.

9.3.2. Fire extinguisher type

All fire extinguishers that have been distributed by NGOs are filled with dry powder, which is rated for all classes of fire types. Dry powder extinguishers are the safest form of extinguishing medium to be used on electrical fires and oil based fires. Many fires in IS ad SSB/SSU may be caused by poor electrical wiring or cooking oil.

There are limitations to the effectiveness in larger fires of the dry powder FE when compared with water FE - they do cool the fire temperature as much. This is a probable explanation for why displaced people have given feedback stating FE do not work when discharged at a fire.

The selection and use of non dry powder types of fire extinguishers for different fire types requires specific and continuous training. Considering the resource and time constraints on NGOs, and the vulnerability of displaced communities, dry powder fire extinguishers are still the safest option for distribution.

9.3.3. Training and Prevention in IS

A limited number of implementing agency staff have received FE training directly from the LCD. There is some inter-agency cascading of training. For example GVC staff receive training from Medair. This may present problems if agency staff train communities having not received standardised or professional training firsthand themselves. The team identified differences in training content and approach, which revealed crucial gaps in knowledge of the safe and effective use of FE.

Aside from FE usage, agencies vary in what information is shared and gathered during such training sessions. Most agencies cover causes and prevention of fire, and mitigation strategies such as making electric cabling safe, safe cooking and heating practices, checking gas bottles, safe use of candles, storing fuel, and response procedures such as evacuation, calling the CD, turning off electricity. Basic first aid, such as how to treat burns and scalds is often not included however, and in some cases was seen as outside the remit of the sector staff were working in.

In some cases, training was limited to distribution of FE, distribution of a safety leaflet, and a quick brief on FE usage. Often time and resources are limited so fire safety training is perhaps not as in depth as necessary, or does not reach enough people. Medair staff, for example, were sometimes delivering up to 5 training sessions a day, which may not allow for enough time to cover of all required topics in depth.

A further concern was that shelter and protection staff had no awareness, or limited knowledge on both basic first aid treatment and fire safety prevention, so could not offer any advice as part of the prevention training. There was a common held belief that they were not qualified and that this was a highly specialised area of knowledge. The assessment team completely disagree. Basic treatment can prevent significant injury and pain the patient and can easily be managed a local level with basic information.

The Lebanese Red Cross also delivers fire safety, first responder and lifesaver training in the south and north of the country to both the Lebanese population and, in some cases, displaced groups.

It is worth mentioning NRC's approach here. It displays good practice in terms of participatory methods: Fire awareness, hazard mapping and hazard awareness activities involve walks around the camp with committees, identifying issues and solutions themselves, including development of evacuation and response plans, with the support of agency staff.

Medair take a similar approach, and committee members and focal points are expected to cascade this training and information to other residents. Then they develop action points, with responsibilities for follow-up. These are then followed up and monitored at later dates by agency staff. Encouraging this level of community involvement is highly recommended.

NRC PDM shows promising results from training cascading.[7] However, there are still concerns over the reach throughout the community. Medair staff estimated that the training perhaps only reaches 20 to 30 per cent of IS residents.

The training of focal points and committees to take proactive roles and responsibilities is good practice. These responsibilities can include evacuation procedures such as head counts, checking tents and reporting to supervisors. This approach is implemented by SI, NRC and DRC.

In conversations with households during field missions, fire risk mitigation, practices and understanding varied to great extents. A major concern is how few residents knew or were able to remember the telephone number of the LCD. The NRC PDM backs this up: 94 per cent of respondents did not know the number of the LCD, or any other first responder.

7 Training cascaded to 60% in one site, and 33% in another site. Of sampled sites 69% reported having taken at least one proactive step to reduce fire risk.

FE training given to IS communities varies. Where CSMCs or CWCs exist, training may be given to these groups, who then have responsibility for cascading and dissemination. NRC and Solidarités International (SI) use this approach. The approach used by Medair is to gather all those who are to receive FE to train them directly. Training generally involves observing the use of an FE on a live fire. However this also poses issues of cascading training with a live fire – not everyone will have seen first-hand how to use the FE correctly on a live fire. The Medair session observed drew in a large crowd of people. This potentially increased coverage, but also ran the risk of some not being able to see and hear. During this session it was also difficult to get full participation of women and men at the same time.

9.3.4. Fire points in IS

PU-AMI have been providing external fire points in IS, which include FE, blankets, a shovel, an alarm bell and a bucket of sand. No other agency reported using these, and some raised concerns about theft or removal of equipment. However, PU-AMI reported no such issues. Nonetheless, the security of each camp is very different, and rolling out such facilities would require consultation with communities and municipalities. External fire points could counteract some of the issues of inaccessible FE in tents, and contribute to higher visibility and awareness of fire safety in the camp. It is vital that any such provision be accompanied by relevant information and advice.

9.3.5. Sub-standard buildings and units

Fire risk reduction in SSB and SSU varies between agencies, with some agencies providing FE and kits, while others do not take this into consideration. Some agencies reported that rapid assessment of SSB prior to rehabilitation or support generally does not include any fire risk assessment. However the Agency for Technical Cooperation and Development (ACTED) reported that every SSB's vulnerability score is logged on the Refugee Assessment Information System (RAIS). This covers certain aspects of fire safety, such as room separation and escape routes.

FE, smoke alarms or any technical items related to fire safety are generally not included on the standard bill of quantities for SSB/SSU rehabilitation. PU-AMI however does includes circuit breakers, and is currently working on developing a firefighting kit for SSB in collaboration with UNHCR They have been requested by donors to fit fire detection in collective centres.

NRC distributes FE and blankets in SSB and rehabilitated SSU, and SI reported minimum fire safety standards for SSB. However, these practices are not standard across shelter implementing

agencies working on SSB and SSU. The rehabilitation support provided by implementing agencies to landlords in exchange for rent offers a big opportunity to integrate simple fire risk reduction measures, but currently there is little being done on this front.

Training for residents of SSB and SSU is a challenge, since residents are widely dispersed. At present little training has been carried out. However, in some cases multiple families occupy the same building. These cases may be opportunities to reach substantial numbers of people at the same time. Rehabilitation offers a big opportunity for shelter staff to disseminate fire safety information and reinforce key messages with households during the process. The scheduled post-rehabilitation monitoring checks that are carried out in the year afterwards are also opportunities to disseminate this information.

In urban contexts, UN Habitat reported a lack of systematised plans or procedures regarding fire safety and reliance on the LCD for any support. Challenges in these cases are the same as for poor urban host populations (challenges in access, particular fire hazards) and outside the remit of this report. However, UN Habitat are currently profiling neighbourhoods in cities, and will share this information when drafted. This information could be integrated in LCD urban analysis to build better knowledge about neighbourhoods.

9.3.6. Post-fire response

Implementing agencies provide post-fire support to IS households via initial evaluation, assessment and coordination of non-food items, shelter, psychosocial needs and FE refilling. Where possible, agencies investigate causes and responses. Medair have been carrying out post-fire focus groups and recording information. Through this they use fire incidents as an opportunity to reinforce safety messages. Sometimes, as with the Minieh 022 fire, there is confusion as to responsibilities on the ground for post-fire response and reconstruction. Again, this highlights the need for a coordinated, standardised approach. Where present, CSMCs should also be involved with post-fire response.

Some agencies have attempted to support IS affected by fire to *'build back better'*. This includes spacing tents further apart, and incorporating access ways. However there are some challenges here, including landowners wanting to maximise the capacity of their land, as well as displaced community preferences.

10. Recommendations

The Operation Florian assessment team has taken a holistic perspective, advocating for preparedness, mitigation and prevention measures. In these recommendations the focus is on IS and SSB.

The recommendations sorted into five main categories:

General recommendations will be relevant to all stakeholders.
IS and SSB/SSU recommendations will provide solutions that are relevant to types of shelter.
IS recommendations are specific to informal settlements.
SSB/SSU recommendations specific to sub-standard buildings and units.
LCD recommendations are specific to Lebanese Civil Defense.

Within each recommendation category there are some or all of the following sub-categories:

Cooperation, Collaboration, Coordination
Prevention and mitigation
Planning and preparedness
Response

The recommendations are numbered, however but this does not indicate an order of priority. It is simply for easy reference. Each recommendation is colour-coded to indicate the timeframe in which each could be implemented according to necessity, time, resources and costs.

Green recommendations should be implemented immediately. They may utilise existing programmes, structures or actions already being considered or undertaken.

Orange recommendations are medium-term objectives that could be implemented within a timeframe of three to six months.

Red indicates consideration to longer-term implementation beyond six months. These have greater cost, resource or organizational impacts. These may actually be currently beyond available capacities but should be a consideration for implementation.

10.1. General recommendations

The following set of recommendations are relevant to all stakeholders including UN agencies, NGOs, LCD and other Lebanese governmental institutions who are working to improve the safety of the Syrian displaced community.

10.1.1. General - Cooperation, Collaboration, Coordination

1 - Creation of national working group for fire and injury reduction in IS and SSB with distinct duty for communication strategy	
Output	• Develop working group focus • Regular meetings to pursue common strategy • Communication strategy • Fire safety messages communicated through social media, mobile texts, radio, etc. • Water proof posters, posters, leaflets, stickers for FE
Outcome	• LCD provide professional guidance on the implementation of working group objectives to reduce fires and burns injuries • Humanitarian agencies contribute expertise and experience • Joint capacity building and development of strategic direction
Potential stakeholders	• MoSA • LCD • Lebanese Red Cross • All NGOs working in Fire Safety

The creation of a national working group is vital to implementing a coordinated strategy to reduce fire risk in IS and SSB. This will help standardise existing approaches.

Throughout discussions with the Assessment Team, NGOs and the LCD welcomed the prospect of collaboration with each other.

The LCD will have a key role in this output, learning form the experiences of NGOs. It is recognised that both NGOs and the LCD have limitations in their capacity. Therefore a joint partnership approach is required, with clearly defined roles according to each stakeholder's strengths and weaknesses.

The group must form an alliance bound by a memorandum of understanding. The mission must be clearly understood to achieve common intent.[8]

The group should meet monthly and focus on standardising fire safety and response training, and coordinating these activities to increase efficiency. The group should also look to build relationships between agencies. Holding meetings at local fire stations could facilitate this, so that NGOs can see the resources and assets available and the limitations of the local response. LCD staff could also visit NGO offices to further understand operational procedures and systems used.

This group would have a separate, distinct duty of communication and awareness. Collaboration should be pursued with other sectors already carrying out communication strategies, for example UNHCR health.

8 See Appendix 3 for an example.

2 - Share best practice of prevention work through national consultation workshop and assist in the development of national prevention materials	
Output	• LCD national training officer and regional training officer to coordinate all current resources using 'Fire Safety in the Home' and 'Francis the Firefly' booklet • Facilitate the organisation of consultation workshop to standardise materials
Outcome	• Agree upon national standards for prevention materials
Potential stakeholders	• NGOs • UNHCR • UNHCR Health • LCD

National workshop to standardise community prevention training for NGO staff working in IS and SSB.

The natural lead for this output should be the LCD. However, it must be accepted that the LCD do not have the sufficient capacity to deliver prevention work in IS or SSB directly. It is noted that shelter Technicians and Advisors in NGOs are among most effective advocates for promoting safety in IS and SSB. Therefore these individuals are also vital to delivering this output.

At present there are significant gaps in information and training.

Therefore, it is highly recommended that a workshop be created for all stakeholders to agree on training criteria, timeframes and costing. Recommendation 4 provides information on recommendations for improvement to the Draft Fire Safety Guidelines document currently being developed in Beqaa. This is the recommended template for development. This workshop should be principally focus on the coordination of best practice and consider achievable goals.

3 - National working group to approve guidelines for the delivery of standardised fire safety and response training for communities in IS and SSB	
Output	• Commitment from all NGOs by signing a MoU supporting fire risk reduction activities through their projects
Outcome	• LCD/MoSA to Chair
Potential stakeholders	• All NGOs • MoSA • LCD

The LCD has invaluable experience, expertise and responsibility in this area. Therefore engagement with the LCD is critical. The LCD's involvement in sanctioning and approving training guidelines is also vital, bringing legitimacy and strengthening relationships between itself the humanitarian sector. NGOs are encouraged to seek further advice and support from the LCD in order to bride any gaps in technical experience or knowledge, and to support the capacity building of the LCD.

4 - Adoption at national level of Beqaa Valley Sub-National Working Group Fire Safety Guidelines for IS and SSB	
Output	• National level fire risk reduction guidelines for displaced populations
Outcome	• Coordinated and standardized working approach across agencies, within communities and by LCD
Potential stakeholders	• Beqaa Valley Sub-National Fire Working Group • MOSA • LCD • Shelter working groups

The Draft Minimum Fire Safety Guidelines produced by the Bekaa Valley Sub-National Working Group provides an excellent framework for adopting fire safety elements which concern both IS and SSB.[9]

The assessment team fully recommend that these guidelines are adopted as a standard in terms of its framework and content. Section 5 of the Bekaa Valley Guidlines highlights areas that should be developed as part of training criteria, specifically burns and injury prevention.

Further recommended materials are in the appendices of this report. These include graphics, posters and booklets. One of these resources, a leaflet called 'Fire Safety in the Home', has already been translated into Arabic and available online as a free resource. This covers all aspects of basic fire safety prevention in the home and advice on what occupants can do in the event of a fire in the home. This was reviewed by representatives of the LCD and was welcomed as an excellent document that would easily be compatible with homes in the Lebanon.

Training guidelines must include elements relevant for SSB. The 'Fire Safety in the Home' document covers such requirements.

9 See Appendix 9 for the Beqaa Valley Sub-National Working Group Fire Safety Guidelines

10.1.2. General - Prevention and Mitigation

While it may not be possible to prevent all fires all of the time, with prevention efforts it is easier to contain and limit the development of fires. This can result in less structural damage and, in many cases, a fire that is easier to extinguish.

Prevention usually involves building codes and regulations with proven enforcement, spatial planning with stakeholder consultation, fire suppression and fire detection.

5 - Share the Collector app with all LCD personnel and ensure regional maps are distributed and all fire vehicles have map	
Output	• Access to data • Laminated maps for every station • Donation of tablets (being discussed)
Outcome	• Improved collaboration • Faster response times • Better operational intelligence
Potential stakeholders	• LCD • Medair • Solidarités International

The Collector App provides excellent location and site information documenting. The LCD should coordinate with Medair and Solidarités International to agree on the regional locations of each mapped zone, and location of fire station areas. Once maps have been agreed the LCD should distribute these to all fire stations. Staff should be made aware of IS locations. The Collector can help improve response times, which are essential to reduce fire spread and damage.

This should be made available to all firefighters in three ways:

1. **Map Distribution:** All stations should be issued with A3 size laminated regional maps with the P-code names and grid references of all informal settlements in each fire station region. These should be displayed on fire station walls so that when a call is received, firefighters can use the maps to rapidly locate the camp. Each fire vehicle should have laminated A4 copies of the maps in each fire vehicle to be used as a map to guide drivers. It is accepted that this is a challenge for sub-standard buildings, as currently mapping does not exist. However, it is recommended that all buildings be coded in a similar manner.

2. **Collector App Access:** All firefighters should have access to the app on their own personal phones. The assessment team observed that most firefighters and displaced peoples have smart phones. Installing the app on these would provide assistance with navigation.

3. **Tablet Access:** The assessment team were informed that Save the Children have a large number of donated tablets, currently stored in Beirut. These could be given to the LCD with the app pre-installed. The tablets should be provided in a hard case to avoid damage if dropped or splashed.

6 - Use of the Collector app and Inter-Agency Mapping Platform for coordinated fire data	
Output	• Added number of fire extinguishers • Number of trained displaced people and date of training • Number of fire incidents
Outcome	• Improved collaboration • Raised fire safety profile • Avoids duplication
Potential stakeholders	• All users • LCD • Medair • UN Habitat

The Collector App has great potential to improve and tailor specific fire risk data being collected by humanitarian agencies.

Further information should be added, for example:
- Number of FE distributed per IS
- Previous incidents
- Reports of any previous civil disturbance

Other hazards such as known location of storage of highly flammable or explosive materials If it is known specific teams have been trained within the IS this should be noted and team leader names and contact numbers provided so firefighters can make contact immediately with key people.

As mentioned above, UN Habitat has begun to collect data for SSB in Beirut and South Lebanon. It is recognised that this is a significant amount of work, but there must be coordination between the LCD, Medair and SI to add further information obtained during site visits or after immediate post-fire attendance and investigation in SSB.

This is also an important potential resource for the LCD to collect locations, site-specific information cover risks, operational tactics, hazards and contact information.

7 - Overlay fire station map with settlements to analyse risk according to response times	
Output	• GIS mapping
Outcome	• Risk based approach to vulnerability
Potential stakeholders	• UNHCR • Medair • Solidarités International • GIS experts • LCD

Adding to the Collector app capacity is vital to begin mapping and identifying high risk IS sites, especially sites where repeated incidents have occurred. The Collector app could be used to measure response times from the fire service. This information could then be used by the LCD to determine optimal locations to store fast response vehicles and fire vehicles with 4 x 4 capability.

8 - Data collection, statistical monitoring of fire events, injuries and fatalities to identify trends	
Output	• Data and statistics detailing location, cause, damage, injuries, cost and intervention methods • Agreed upon national standard framework for reporting of all incidents
Outcome	• Ability to target resources effectively to reduce fires and injuries • Reduction in fires and injuries
Potential stakeholders	• All NGOs • UNHCR • UNHCR Health • LCD

The importance of collecting and monitoring statistical data cannot be neglected. At present very few of the agencies could provide immediate, disaggregated data about the number of fire events, causes, deaths or injuries. Currently the LCD only record the number of fire events they had attended.

In the UK, fire and rescue services use fire data to identify patterns and trends that can be used to direct resources effectively and establish targeted campaigns or fire safety projects.

There may be clusters of events suggesting an unrecognised hazard. It may become evident, for example, that one IS or SSB experiences more fires than the others, or that most fires occur during a particular period.

This information can then be discussed through the established fire committee and actions can be taken to prevent further events.

The most effective method of recording data is to log the basic details and then plot the fire events on a map of the area. The Collector app could be used for this task.

All fires that cause material damage need to be reported. It may not seem important to report small fires, but accurate data recording is required in order to build up a clear picture of fire risk issues. Fires that are started as a result of arson must also be reported and recorded separately. Fire-setting behaviour in individuals can occur for a variety of psychosocial issues. Early identification and timely intervention with children who deliberately set fires can prevent the fascination becoming a high risk.

It is also prudent to reflect on the fire event to identify and learn lessons that might prevent or mitigate re-occurrences. For example:

- What would have happened if the fire had started at 01:00 in the morning rather than 13:00 in the afternoon?
- What if the people who were on hand to put out the fire had not been there?
- The fire may have been dealt with quickly, but what could we have done better?

Appendix 6 provides a template design in a simple format. This could be standardised across NGOs and LCD to make direct comparisons and identify themes or trends.

9 - Scalds and Burns campaign	
Output	• Creation of leaflets and posters • Inclusion of prevention and basic burns treatment during fire awareness training in IS and SSBPresentation and practical techniques targeted at women's groups
Outcome	• Reduction in scalds • Early intervention of burns leading to reduction in severity • Raised awareness in camp population
Potential stakeholders	• All NGOs in Shelter, WASH and Protection • UNHCR • UNHCR Health • LCD • Lebanese Red Cross

The high rate of scalds and burns occurring is alarming. This can be reduced dramatically with improved training and awareness to all shelter, protection and WASH staff who regularly visit the IS and SSB.

Creating simple literature and presenting advice during visits would an effective strategy.[10] The fire safety awareness training programme could include the creation of a role such as Community Safety Advisor, who would provide information to communities and specific groups on basic burn prevention and treatment.

Specifically this output can involve making people aware of 'Stop, drop and roll'. This is effective when items of clothing catch fire. It is specifically relevant to women who wear long dresses with lots of fabrics.

Basic burns treatment must be covered in the training syllabus. During field visits and discussions the team were made aware that treatments such as the use of toothpaste on burns. This is an unsafe practice as toothpaste has no cooling effect on the burn skin tissue. The most effective pre-medical treatment for burns is water.

10 Suggested visual resources can be found in Appendix 7

10.1.3. General - Planning and Preparedness

Planning and preparedness leads to faster, more accurate and more focused fire response. These measures will help key actors to be better equipped, trained and educated. This will help make IS and SSB/SSU more resilient and less vulnerable.

10 - Delivery of community fire safety training to NGO field staff who work in IS and SSB	
Output	• All staff attend standardised fire safety training
Outcome	• Field staff are able to recognise fire hazards and risks • Better understanding of the benefits, constraints and community perception • Provides greater awareness of risks to displaced and vulnerable groups
Potential stakeholders	• All NGOs • UNHCR • LCD

All NGO staff who work within either IS or SSB/SSU should receive fire safety awareness and training. Fire safety awareness and awareness of fire risk reduction should become embedded within the roles and responsibilities of all staff members. This will enable them to provide ongoing advice and support whenever they visit IS and SSB/SSU.

It is not suggested that this has to be a highly qualified position. Creating more risk-aware staff members at all levels is desirable. Additionally, as many NGO staff members are Lebanese citizens, there are opportunities for them to promote fire safety in their own communities.

11 - All NGOs and organisations to include fire safety in their security training for staff, consultants and visitors	
Output	• Security brief from security lead • Adaption of any existing training
Outcome	• Better prepared staff, consultants and visitors • Better able to recognise hazards and risks of fire
Potential stakeholders	• All NGOs • UNHCR • LCD

Currently, each NGO facilitates a detailed security brief for staff. However, a gap exists regarding fire safety training and awareness. Training should include all elements of basic fire safety awareness including escape plans, understanding where assembly points are and what to do in the event of a fire. This is especially important when staff or guests are staying at hotels or guesthouses.

The training can be adapted out of the pre-existing fire safety training developed by the LCD which is to be delivered to NGO staff working in the IS and SSB. This will increase general institutional awareness of fire safety, as well as increase security for staff and visitors.

12 - Distribution of Civil Guardians CD game	
Output	• Distribution of discs to NGOs working in shelter and protection and for schools
Outcome	• DRR education aimed at children
Potential stakeholders	• All NGOs • UNHCR • LCD

Nabil Salhani, Civil Defense Director of Training, has created a CD game to educate young people in fire prevention and awareness. This should be reviewed by the national working group and adapted for distribution to all NGOs working with young people.

Not all NGOs will have the IT facilities to use this resource. However, during discussions with NGOs such as Gruppo di Volontariato Civile (GVC) there clearly was an interest in this sort of resource. It also has potential to be adopted by the LCD as a national resource.

13 - Fire Extinguishers to have operating instructions with pictures and in Arabic	
Output	• Change purchasing agreement • Apply sticker
Outcome	• Beneficiaries are able to understand the instructions
Potential stakeholders	• All NGOs • UNHCR • LCD

During field visits it was observed that many FE were labeled in English. Some FE had a combination of English and Arabic labeling. Most, if not all, FE are purchased from a single distributer by UNHCR and NGOs.

All fire extinguishers must have instructions in Arabic. To achieve this, the tender requirements for the purchasing of FE need to specify this. Current FE need to have a sticker applied with pictorials and text in Arabic. The Red Cross have a suitable adhesive sticker already designed. This could be shared with other stakeholders.

There should be further information on each FE giving emergency contact numbers such as the LCD. Labeling should also clearly indicate the instructions for refilling. It should also clearly state that once a FE has discharged it must be refilled.

14 - Develop/share a library of audio/visual materials for fire safety	
Output	• Appropriate materials on various platforms
Outcome	• Avoids duplication • Saves time • Provides various learning tools • Educates community
Potential stakeholders	• Operation Florian • All NGOs

A library or central resource bank should be created and maintained by the national fire committee for all NGOs to access further information. This would help with evidence collection to develop further understanding and insight of the fire risks. This should include audio and visual resources can be accessed online (for example on YouTube) for the benefit of displaced people. These could be used as essential learning resources when delivering fire safety awareness training or home visits.

Operation Florian and the LCD could assist in the collection of such materials.

15 - Implementation of child fire safety awareness and education programme	
Output	• Development of training package for life skills programme • Adaptation of 'Francis the Firefly' book • Providing community fire safety literature and tools
Outcome	• Create awareness among children of risks of fires and safety • Reduction of burns injuries and fires
Potential stakeholders	• Save the Children • Operation Florian

A number of fires started attributed to children playing with lighters. This is a major concern. In an environment where education opportunities are low and boredom is high, if lighters are easily reachable it is likely that children will play with them, unaware of the danger.

The UK Fire and Rescue Service run a wide range of child intervention programmes with fire safety classes delivered in schools, children visiting fire stations and using resources such as 'Francis the Firefly' as a storybook. The story teaches about dangers of playing with fire.[11]

Such programmes could be run in the child friendly spaces organised by Save the Children. The educational resources could easily be translated into Arabic and used by any NGO working with children.

A further advantage of promoting child safety awareness is their ability to pass on knowledge into the community. This can change the behaviours and attitudes of parents and other adults.

16 - LCD to deliver community fire safety training to NGOs	
Output	• 'Train the Trainer' package • Courses delivered on local fire stations
Outcome	• Provides greater awareness of risks to displaced and vulnerable groups • Advance relationships between NGOs and LCD • Improves morale of firefighters
Potential stakeholders	• All NGOs • Operation Florian • LCD

The assessment team strongly recommend that fire safety training is led and delivered by the LCD regional instructors at regional fire stations. The LCD is the appropriate national agency to deliver fire safety training. They can create opportunities for NGOs and displaced communities to receive continuous training and awareness.

Training delivered at regional stations enables local NGO staff to attend, saving time and resources. This can help build relationships at a local level between LCD regional instructors, local firefighters and local NGO staff.

17 - Creation of standardised Fire Risk Assessment document for IS and SBB	
Output	• Standardised Fire Risk Assessment document for IS and SBB used across NGOs
Outcome	• Fire risk assessment will document needs and responses within a standardised format • Document fire risk assessment, response, prevention and evacuation plans
Potential stakeholders	• Operation Florian

11 See Appendix 7 for a link to this resource.

A fire risk assessment is made up of an analysis of the risks of fire and an evaluation of their likelihood. The OF team consider the answer to three simple questions:

- What can happen?
- How likely is it?
- What would be the consequences?

A standardised risk assessment form for NGOs to use would analyse and evaluate risks, offering the opportunity to begin to prioritise sites accordingly and address the risks with suitable measures.

A qualitative method is most suited to this type of assessment. However, over time, reliable statistical data on fire events can strengthen the risk picture.

The Operation Florian team favour a *risk matrix* where combined scores of severity and likelihood generate a grading from very high to low. Very high sites will need immediate attention.

Operation Florian would welcome a request to work on this risk assessment template, but ultimately the form must be owned by the National Fire Committee/Working Group, and only one template must exist.

18 - Film documentary on Case study	
Output	• Short film produced to show to the displaced population
Outcome	• Greater understanding of the trauma following a serious fire • Promote fire safety and risk reduction
Potential stakeholders	• Save the Children • UNHCR • All NGOs

The production of a short film documenting the risk factors, circumstances and impacts of a real fire incident in both an IS and SSB could be used to encourage greater awareness of fire risks.

A short documentary film, uploaded to YouTube and shared through social media, could provide an excellent educational resource. The case study in Appendix 8 could provide a powerful storyline.

The assessment team met a UNHCR Official in the Bekaa Valley who makes documentary films and who was very interested in the opportunity to work on this. The team recommend that this be followed up.

All NGOs could support the distribution and viewing of the film as part of their own coordinated prevention efforts.

19 - Organise annual Fire Prevention Week	
Output	• An annual event across the country to promote awareness of key themes and issues related to fire • Create posters, materials and TV campaigns for public awareness • Organise key public awareness events • Organise training programmes • Check IS and SSB existing arrangements
Outcome	• Raise awareness of risks of fires and fire safety • Raise the profile of LCD
Potential stakeholders	• All NGOs • UNHCR • UNHCR Health • LCD

The LCD, in partnership with the national fire working group, should aim to organise an annual fire prevention week as part of a wider safety campaign in displaced people's accommodation. It is recommended that a national annual campaign be organised which allows government institutions and NGOs to prioritise fire awareness and injury prevention as a key objective. This can be done by pooling resources and targeting specific groups in a unified approach.

This can be used as an opportunity to carry out inspections in various settlements, and meet communities for refresher training. This could be linked to with a national campaign for Lebanon to promote the wider issues of fire prevention to reduce domestic and forest fires.

This is an excellent opportunity for the LCD to raise its profile nationally regarding fire awareness. This should go beyond poster campaigns, and could be promoted by hosting fire station open days and coordinating NGO resources to focus on specific areas or issues.

20 - Review of the provision of fire extinguishers (type and cost versus benefit)	
Output	• A report that considers all the options, limitations and alternatives
Outcome	• Standard operating procedure for fire extinguishers
Potential stakeholders	• LCD • All NGOs

There are concerns about the sustainability of distributed FE and the associated costs of maintenance and refilling.

It is acknowledged that there has been some excellent work done in training and distribution. However, some challenges and gaps identified. All NGOs must have a common strategy. The Norwegian Refugee Council's FE post-distribution report provides excellent analysis. It is recommended that this be shared among all stakeholders.

As previously identified, the accepted risk of electrocution due to illegal wiring and a lack of circuit breakers requires the use of dry powder (DP) extinguishers. However, as fires take hold and develop, DP FE are rendered ineffective quickly and a water FE will have far greater effect. Nonetheless, providing water FE in addition to DP FEs presents substantial risks - specifically the continued presence of electrical hazards - and no obvious safe means to confirm if electricity has been, or can be, isolated.

Provision of water FE would require more extensive training of displaced people in order to identify the right type of extinguisher to use in a given situation. Therefore DP FE are the safest, but not necessarily the most effective, option at present. This again highlights the need to focus efforts on increased community prevention training and awareness.

10.1.4. General - Response

The following recommendations focus on building realistic and unified response arrangements between the IS, NGOs and the LCD. However, there is some relevance to SSB since improved capacity of the LCD helps education and awareness for all displaced residents within SSB.

Developing an effective response to IS fire incidents is now a main priority due to the severity of previous incidents and slow response times. Many IS do not have sufficient capacity to respond to fire related emergencies. The outcomes of an effective response strategy will be improved resilience and capacity of communities and support structures. This will improve security, safety and reduce risk to vulnerable groups.

Any fire response strategy must consider the following conditions:

- Time is a critical factor – alerting the response must be uncomplicated.
- Fire development can be fast in this environment due to weather conditions and building materials.
- Travel distances and road conditions for emergency vehicles.
- The availability and functionality of firefighting equipment.
- Human behaviours and capabilities.
- The provision for effective training for most likely types of fires.

21 - Development of community firefighting teams	
Output	• Trained community based firefighting teams who are able to respond to fires locally, and advocate fire safety and prevention in IS
Outcome	• Improved fire safety and awareness within IS communities, reduced fires and injuries
Potential stakeholders	• UNHCR • LCD • CSMC groups • Refugee Outreach Volunteers • Shaweesh • All Stakeholders

It is recommended that community firefighting teams made up of residents are created in each site. The teams could take on further responsibilities in IS for promoting fire safety, FE training, and maintaining fire points and signage.

The team should be made up of both men and women of the community, and if considered appropriate, include outreach volunteers and the shaweesh. A higher level of knowledge and training should be provided to this team. This could include:

- Firefighting with beaters
- Coordinating evacuations of IS
- Coordinating the creation of fire-breaks
- Working with the LCD during fires
- First aid training

At present Solidarités International, Norwegian Refugee Council and Danish Refugee Council recommend the training of focal points/committees to take proactive roles and responsibilities. These responsibilities include, for example, evacuation procedures, head counts, checking tents and reporting to supervisors. This is good practice, and supported by the Operation Florian team. The LCD should be involved in the development of training programmes, but this should be coordinated at the request of NGOs working within IS who can begin to work with communities and develop community response teams.

The team have seen similar approaches in field assessments in Kenya and Thailand. In these situations fire response was improved by the development of community teams.

While this will take time and resources, it is essential for any IS that are remote from roads or a far from fire stations. It is recommended that settlements with ten or more tents should have community response teams. However, it is acknowledged that each IS differs in dynamics and capacity. This should be considered when selecting teams during the early stages of development.

10.2. Recommendations for informal settlements, sub-standard buildings and sub-standard units.

The following set of recommendations address specific improvements for both IS and SSB/SSU.

10.2.1. IS and SSB/SSU - Prevention and Mitigation

Preventing most fires in IS and SSB/SSU is achievable, and there are some common features to fire prevention and mitigation to both types of settlement.

22 - Share best practice for kitchen set-up	
Output	• Continuous intervention and advice during field and home visits given by shelter coordinators, protection or CSMC teams and WASH • Photographs shared through social media sites and used as an aid to educate displaced communities and NGO staff, demonstrating the good and bad examples • Hand out 'Fire Safety in the Home' leaflet • Hand out copy of 'Francis the Firefly' story
Outcome	• Reduction in fires as a result of cooking • Reduction in burns and scald injuries
Potential stakeholders	• NGOs • Lebanese Red Cross • UNHCR • UNHCR Health • LCD

Integrating best practice for cooking into fire awareness training should be the role of the group discussed in recommendation 1. The content can be divided into equipment, behaviours and techniques. The target audience should be those that prepare and cook food, and those that have experienced cooking fires already.

Human error is the most likely cause of cooking fire incidents. Intoxicated people, those with mental health issues, the young (especially young girls), and the elderly are the most vulnerable categories. Culture and tradition need to be carefully considered in finalising a 'best practice' plan.

The OF team propose the following areas for discussion of cooking best practices:

Equipment

- Single sockets and the use of fuses
- Matches and lighters
- Position of the stove
- Use of a backplate
- Gas cylinders
- Hoses and connections
- Blocked burners
- Filthy ovens and grills/fat build-up
- Chip pans

Behaviours

- Overloaded sockets
- Smell of gas
- Matches and lighters out of reach
- Children turning knobs on the oven
- Turning in pot handles so children cannot grab them
- Never leaving cooking unattended
- Closing kitchen doors
- Turning everything off after use
- Clearing up spillages to prevent accidental falls
- Clothing that may catch fire when cooking near to a naked flame

Techniques

- Chip pan fire extinguishment with a wet towel or fire blanket
- Stop drop roll if clothes catch fire
- Actions to take if a gas cylinder catches fire
- Dealing with a burn or scald from a hot pan
- Use of timers or microwaves for persons with dementia
- Guards for ovens to protect children
- Open fires do's and don'ts

23 - Safer use of candles	
Output	• Inclusion within all fire safety literature • Demonstration by NGOs • Advocacy of safer use during home visits
Outcome	• Reduction in fires caused by candles
Potential stakeholders	• All NGOs • UNHCR • UNHCR Health • LCD

Candles have been reported as one of the main causes of fire. The use of candles is widespread. They are often placed on top of TVs, on concrete bases using the wax to keep it upright or on small metal plates/ashtrays.

All of the above present risks, as the candle can burn down and melt plastic. Candles are easily knocked over. Alternative methods such as using ghee tins filled with either soil or sand should be advocated. This makes them less likely to be knocked over, and the contents can be used as firefighting medium for small fires. This can be easily promoted during a visit by NGO staff. It should feature as part of the NGO fire safety training programme.

24 - Eliminate time lags between replenishment or servicing of fire extinguishers	
Output	• All FE replenished promptly
Outcome	• Increased rates of fire suppression with FE
Potential stakeholders	• Shelter sector

It is not acceptable to have a replenishment programme that leaves the beneficiary without an extinguisher. FE schemes need to be robust and have sufficient spares to cover servicing and refilling.

There is a need for rationalising the distribution of FE, which would reduce the total numbers of FE available. In by doing so there would be a potential reduction in the costs of refilling FE. It must be accepted that FE and fire safety costs need to become mainstreamed into project costs. Ultimately maintenance costs FE are unavoidable. However, they can be made manageable if fire points are established with a more involved community safety programme, along with the development of firefighting teams. This will reduce the rate of discharging of FE.

25 - Promote visits to fire stations for all NGOs, schools and young children from IS and SSB	
Output	• Clear procedure for booking arrangements and expectations for fire station visits
Outcome	• Visits to be arranged where young children can receive fire prevention awareness and information • Firefighters can be seen as positive role models and promote LCD activities
Potential stakeholders	• LCD

The LCD provides opportunities for communities and schools to visit fire stations. This is an excellent opportunity for community engagement and delivering fire safety education.

This opportunity is not widely known and should be shared to all NGO stakeholders. The correct procedure for arranging a visit should be clarified. At present this is done through the National Training Officer, Nabil Salhani.

26 - The issuing of flame retardant mattresses	
Output	• Safe mattresses used by households in IS and SSB
Outcome	• Reduction in fire spread through flammable household materials
Potential stakeholders	• Shelter sector • NGOs • UNHCR

> *"Flame retardants are chemicals which are added to combustible materials to render them more resistant to ignition. They are designed to minimise the risk of a fire starting in case of contact with a small heat source such as a cigarette, candle or an electrical fault. If the flame retarded material or an adjacent material has ignited, the flame retardant will slow down combustion and often prevent the fire from spreading to other items."*
> - The European Flame Retardant Association.

Furniture and mattresses are made of foams which pyrolyse at low temperatures and burn readily. Mattresses have been issued by NGOs and it is suggested that future support is with a flame retardant mattress conforming to BS7177:2008+A1:2011.

27 - Replace light bulbs with low energy lighting	
Output	• Exchange programme
Outcome	• Reduction in electricity demand • Lower electricity bills • Lower heat • Better for the environment
Potential stakeholders	• Shelter sector • WASH sector

Seeking alternatives to candles and other naked flames is essential. Low energy lighting and LED bulbs are one option. They use less power and are therefore able to maintain a relatively low temperature. There are also environmental and cost benefits.

Ultimately the reduction in power will mean less electricity is being consumed, lessening the load on informal or dangerous electricity connections. Current bulbs could be replaced with low energy versions as part of an exchange programme.

28 - Development of an Electricity Safety kit	
Output	• Insulation tape, socket tester, wire connectors, circuit breakers, trunking, junction box, switch, low energy bulbs or LEDs, light bulb holders, do not touch sign, earthing system, cable ties
Outcome	• Reduction in electrical fires • Reduction in electrocutions • Increased firefighter safety
Potential stakeholders	• Shelter sector • MoSA • LCD

It was evident to the assessment team that there were differences between IS as regards improving safety and reducing electrical hazards. In the Akker region IS visited had used electrical tape to join electrical wires safely and used circuit breakers. In Minea 022 the camp leaders had undertaken fire training, which involved isolating electrical supplies before firefighting.

It is suggested that every shahwesh, CSCM or IS firefighting team is given an electrical safety box containing the items listed above. They could then undertake a site improvement project, and use the box for continuous maintenance.

29 - Adapt Fire Safety in the Home information leaflet for IS and SSB	
Output	• Information leaflet to be distributed during visits by shelter team members • One per household
Outcome	• Fire safety advice in Arabic suitable to the context
Potential stakeholders	• Save the Children

The Fire Safety in the Home information leaflet, which has been translated into Arabic, provides excellent fire safety information for SSB occupants.[12] This has been presented to the LCD for evaluation and has been acknowledged as an excellent resource. This should be distributed by shelter technicians to every home and family during visits. This should form part of the rehabilitation process.

It is recommended that this document is reviewed by the National Fire Committee/Working Group and adopted by all NGOs for SSB.

12 See Appendix 7

An element of the initial fire safety workshops should be used to generate a more aligned 'Fire Safety in the Home' leaflet for distribution to IS. The principles could be adapted for IS with a similar format. Some information will have to be changes, such as the removal of some information such as escape plans and the inclusion of information regarding burning of waste.

30 - Standardise distribution of fire extinguishers within IS and SSB	
Output	• Agreed upon common strategy for distribution ratio and location of fire extinguishers
Outcome	• More sustainable costs for NGOs • Greater responsibility to communities within IS • Easier access to fire extinguishers during fire
Potential stakeholders	• All NGOs • UNHCR • LCD

The number of extinguishers per household must take a risk-based approach given that a formal response from the LCD can vary according to a number of components. A recommended starting point would be 1 FE per five households in IS, which should ensure that from any given point, a FE is no more than 50 meters away. In some situations more FE will be needed, these include:

- Sites that have encroachment or insufficient fire breaks
- Sites with poor access or means of escape
- Sights that have historically seen a high number of fire incidents
- Sites that are home to extremely vulnerable individuals

Distribution in these situations will require a site-specific assessment.

SSB require at least one fire extinguisher per floor in buildings of multiple floors. The FE should be placed in the corridor so that it is accessible to everyone. Accessibility is crucial for rapid response. A dry powder FE will only provide up to 30 seconds of media. Sometimes this may not be sufficient to extinguish the fire, merely slow its development. It is recommended that there be designated fire points where communities know the FE's location along with other vital, basic, firefighting equipment.

FS are consumable items and will need to be tested and refilled without leaving communities with no form of extinguishing media. A cost/benefit analysis should also be conducted that considers the maintenance costs and foreseeable situations such as new sites, or extinguishers being sold.

If the ratio of 1 to 5 is unachievable, then work according to what provides a manageable response across the risk area. In this case a National Fire Risk Reduction Committee might need to decide if it is better that everyone has some means of fighting a fire, thus providing all sites with FE, or that the allocation of FE must be done according to risk (for example, a fire on a large site has the potential to be more devastating than that of a single isolated dwelling).

31 - All current and existing fire extinguishers to be hung on a wall bracket in IS and SSB	
Output	• Brackets and fixings required
Outcome	• Reduces damage to the extinguisher • Maintains a fixed position for the FE's whereabouts
Potential stakeholders	• All NGOs working in Shelter sector

In some camps FE were left on the floors in tens or in inaccessible places. In other camps there was good practice of FE being fixed on a bracket high in a tent. This provides easy access for someone to use, and keeps the FE away from children who may discharge it.

All FE should be fixed in this manner, and inspection of these should be a requirement of NGO staff visits.

As mentioned above, there should be a move to more public access FE with the creation of designated community fire points in which FE are stored in cabinets. It is accepted that this may not be ideal in all IS on account of the risk of theft or vandalism. If, on the assessment of the community and responsible NGO, fire points are not possible, then FE should be placed on brackets on walls inside tents.

10.3. Recommendations specific to informal settlements

The following recommendations are specific to the reduction of fire risks in IS.

10.3.1. IS - Prevention and Mitigation

32 - Testing of flame retardant tent material leading to the distribution of chosen material in shelter kits. The shelter kit to include metal instead of timber and two rolls of insulation tape for IS sites.	
Output	• Flame retardant sheeting • Metal frames • Tape
Outcome	• Reduction in fire spread and fuel
Potential stakeholders	• Shelter sector • MoSA • UNHCR • LCD

During interviews with a wide range of NGO staff it was confirmed that, despite witnessing many post-fire situations, no one interviewed had ever witnessed an ongoing fire and fully understood the speed and rate of fire development involving the materials used for tents.

It is highly recommended that fire tests of tents with various materials are commissioned, with assistance provided by the LCD This should be done to test their flammability, fire growth and heat intensity. This will require a coordinated effort and input from all NGOs. This is essential as all NGOs face similar challenges with the methods of construction and types of materials used. If there is a common understanding of fire spread in these specific conditions, greater pressure can be placed on donors to approve and finance more substantial, fire resistant materials.

There should be a minimum of three tests in which three identical tents with similar contents and furnishing are used:

Test 1 Should use existing materials for the construction of tents and with tyres placed on top.
Test 2 Should use the existing materials with the inclusion of fitted insulation material that has been distributed as part of the winterisation process. Sand bags should be used as a replacement for the tyres.
Test 3 Should use canvas sheeting which has fire resistance rating which has already been researched by STC and NRC.

33 - Replace tyres used on the roof of shelters with sandbags or rocks in IS	
Output	• Provide bags: six per household • Agreed national minimum standard by all NGOs, for NGOs working in shelter sector and CSMCs
Outcome	• Provides extinguishing media • Reduction in fire fuel
Potential stakeholders	• NGOs • CSMC groups, community focal points, shaweesh

In all IS visited, many tents had tyres placed on the top of them to weigh them down. A main reason that tyres are used for this is because they can be obtained for free. However, tyres provide additional fire loading and fuel. Despite advice given to the contrary, many of the displaced community were still using tyres. This may be because these were the only cost effective solution.

It is recommended that all NGOs start a programme to replace types with sandbags. Sandbags can be filled with either sand or soil that provides a suitable replacement. They can also be used to extinguish fires when FE are unavailable.

34 - The storage of rubbish/waste material within a metal container with lid where rubbish is burnt in IS	
Output	• Waste is contained
Outcome	• Reduction in fires caused by burning of waste
Potential stakeholders	• All NGOs in Shelter sector • WASH

Ideally burning of waste should not occur. However, the reality is this practice continues. Often it takes place near to tents and public areas.

It is highly recommended that specific metal containers are obtained so that waste can be burnt off in a specific area, located away from flammable structures. This should be monitored where possible by CSMC groups/focal points within the camp. Residents should also be encouraged to always find alternatives to burning waste.

35 - Fire Safety Stickers and information poster applied to fabric of tents in IS and trial alternative methods such as spray-painting a FE shaped stencil. Fire safety information posters should be	
Output	• Stickers/posters for all IS tents
Outcome	• Raised awareness among displaced population • Identify location of fire extinguishers
Potential stakeholders	• Shelter sector • MoSA • UNHCR • LCD

The location of all FE in tents should be identified clearly on the outside of the tent material.

It would be preferable that stickers are used. However, it was highlighted to the assessment team that in winter the stickers can fall off due to the weather conditions.

It would be advisable to test other methods such as using a stencil and spray-painting a FE shaped symbol onto the tent.

All identification labels should be checked as part of a CSMC or shelter fire teams routine checks, during post fire inspections and as part of an annual fire safety campaign.

It is recommended that every tent receive a general safety guidelines leaflet This should be installed in an obvious position in a tent. As evidenced in the photo above, a similar leaflet could be designed providing key advice such as emergency numbers, emergency contact names and basic fire safety advice in the home.

36 - Heat Detector trial for IS	
Output	• Trial of heat detectors in IS
Outcome	• A high tech warning and informing system
Potential stakeholders	• Shelter sector • MoSA • LCD

UNHCR is involved in testing a heat detector system as a part of an innovation award. The assessment team reviewed this and believe it has potential. However, there are similar products already available. For example, Lumkani have developed an early warning system for shack / slum fires.

Lumkani have developed heat detectors which use rate of rise temperature technology to accurately measure the incidence of fire within a 60m radius of each detector so that in the event of a fire there will a sufficient early warning all detectors will ring enabling a community response. This enables the community to be pro active in rapidly spreading fire situations.[13]

Heat detectors are appropriate for IS since smoke detectors are likely to be constantly triggered by smoke from cooking and heating. This would lead to many smoke detectors being disconnected.

37 - Use of solar lighting in IS	
Output	• Assessment of suitability of solar lighting by specialist report
Outcome	• Better understanding of the benefits, constraints and community perception • Potential reduction of candle fire related incidents and electricity issues
Potential stakeholders	• UNHCR

Solar lighting may be a good alternative to avoid both dangerous wiring and candle misuse. The benefits of solar lighting are well understood and there are examples in Lebanon of this practice. The assessment team recommend that a report be commissioned to carry out a costs/benefits analysis on the use of solar lighting in larger IS sites.

13 More information can be obtained at www.lukhami.com

38 - Inclusion of fire safety issues in the spatial planning and redesigning of IS following significant fires to prevent issues of congestion, encroachment and poor access. Additionally, considering the location of critical infrastructure.	
Output	• Standard planning process including fire safety measures • All planning and development inclusive of fire safety measures
Outcome	• Reduction of fires in IS • Combined fire hydrant/refilling locations and designated fire points
Potential stakeholders	• Shelter sector • MoSA • Municipalities

Current practice following fires on sites is to use the window of opportunity to reconstruct a better living environment. However NGO feedback is that fire safety issues are often ignored or piecemeal. Nonetheless, there were examples where tents had been replaced and wired to a far higher standard following a fire. Fire-breaks were reported to have been discussed with the local population, and dismissed on account of the reduced space for dwellings.

Landlords and municipalities are resistant to any kind of formalised site planning, and must be respected. However increased distances between properties significantly reduce the spread of fire. Exploring any room for manoeuvre for some kind of tent rearrangement is strongly encouraged.

When constructing tents, agencies also need to consider means of escape. Many dwellings had only one exit which, if blocked by fire, would make a very dangerous situation.

The assessment team has seen, in other countries, the deliberate destruction of homes in the belief that the replacement shelter will be better. It was observed that the replacement homes in Lebanon, following a fire were considerably better than before. There is a concern that this might start to happen in IS in Lebanon.

Local and critical infrastructure close to IS need to be evaluated. The team visited an IS in the Mount Lebanon region. This IS was adjacent to an electrical sub-station. Any fire on that site may well affect the sub-station leading to the loss of electricity to thousands of homes. This could have significant economic repercussions. Fire safety on that particular camp, and others like it, needs special attention.

10.3.2. IS - Planning and Preparedness

Planning and preparedness in IS can lead to a more timely, effective response. All the measures should ensure that key actors are better equipped, trained and educated.

39 - Improve utility of Fire Points in IS including public access to fire extinguishers and fire beaters	
Output	• Fire points created with relevant equipment provided • Fire safety posters attached to each Fire Point • Regular inventory checked conducted and enforced by responsible persons
Outcome	• Improved identification of FP • Utilise fire points as a public safety notification board
Potential stakeholders	• All NGOs • UNHCR • LCD

The creation of fire points in larger IS is strongly recommended. In many displaced population camps around the world these have been created with considerable success and contain a variety of specific equipment. As illustrated by the photos above, these have been implemented in Mae Sot Refugee Camp, Thailand, and have been utilised successfully with a variety of equipment such as fire hooks to assist with creating fire-breaks, and fire beaters as additional firefighting equipment with the construction of a concrete basin built to contain a ready supply of water.

The assessment team recognises concerns about security and maintenance of such fire points. However, these can reduce overall costs and distribution needs of FE. If this recommendation is taken up those involved would have to decide if fire points are to be publically accessible or only for dedicated IS fire response teams.

It is recommended that selected IS are initially identified to pilot fire points in order to evaluate them.

40 - Early warning and informing system on settlements of over 10 tents in IS	
Output	• Siren, loud hailer, foghorn or PA system
Outcome	• Early response and evacuation
Potential stakeholders	• All NGOs • UNHCR • LCD

In situations where fire can spread rapidly, such as in IS, it is vital to have a way to alert everyone quickly. Basic technology is sufficient. It is key that the sound is associated with evacuation and the device easily accessible. Typical devices are sirens, foghorns, triangles and bells.
The device would be the first step in an evacuation plan. The plan should be tested annually by means of a fire drill.

41 - Emergency numbers awareness poster distributed and displayed in all IS	
Output	• Use or adapt Red Cross poster
Outcome	• Raise awareness of emergency numbers in displaced population • Quicker response times from LCD
Potential stakeholders	• All NGOs working in Shelter sector

There is a wide belief that there is signage around each camp which present the emergency contact numbers. However, these were not immediately obvious to the assessment team. On a number of occasions in either IS or SSBs when people were asked what number to all in an emergency they did not know.

As part of any fire risk assessment in a camp there should be easily identifiable signs which detail emergency numbers. These should be checked by shelter teams and all residents should be made aware of the position. It would be further advantageous for each sign to provide the IS location P-code so when a call is made the caller can immediately provide location details for an improved fire response.

42 - Fire evacuation drills and training simulations to exercise fire response plans in each IS	
Output	• Minimum of annual exercise to test plan
Outcome	• Raise awareness to issues to risks of fires • Raise the profile of LCD
Potential stakeholders	• All NGOs • LCD

Fire evacuation drills are another important aspect of any fire prevention or preparedness strategy. This should be part of a National Fire Prevention week, or as part of an overall fire risk reduction strategy.

The community should coordinate this. It should involve everyone and test the knowledge and awareness of evacuation assembly points.

The assessment team recognises that this is already happening in some IS. Wider adoption of these practices is recommended.

10.3.3. IS - Response

The provision of an effective response in IS has become and obvious priority due to the severity of, and slow response to, previous incidents. Many IS lack the capacity to respond to fires effectively.

Any fire response strategy must consider the following conditions:

- Time is a critical factor – alerting the response must be uncomplicated.
- Fire development can be fast in this environment due to weather conditions and building materials.
- Travel distances and road conditions for emergency vehicles.
- The availability and functionality of firefighting equipment.
- Human behaviours and capabilities.
- The provision for effective training for most likely types of fires.

43 - Purchase fire beaters with longer poles (150cm handles made of ash wood) for fire points in informal settlements	
Output	• Change of purchasing specification
Outcome	• Additional effective equipment • Reduce burns
Potential stakeholders	• UNHCR • All NGOs

Fire beaters are an additional option for firefighting, and can be used alongside FE. They are widely used around the world for grass and wildfires. Fire beaters are simple tools, constructed from wooden poles with either a metal or rubber beater attached. They are low cost and low maintenance.

Fire beaters should be located at a fire point. A distribution ratio of 4 beaters per fire point is recommended. Feedback from the field suggested some concerns as to the security and safe keeping of beaters. This is something that should be discussed among NGOs and communities.

44 - Provision of basic firefighting equipment to IS	
Output	• Delivery of range of basic firefighting equipment suitable for level of skill and environment such as beaters, rakes, galvanised buckets full of sand, pike poles, shovels, W&I device
Outcome	• Provide improved firefighting capacity within all camps • Reduction of burns injuries, fatalities and loss of homes and possessions
Potential stakeholders	• UNHCR • Shelter Sector

Additional to the above, some IS have further opportunities to expand the types of equipment that can be used, such as buckets, rakes and shovels. These should be stored at fire points.

This may not be possible for all IS as there is a risk of theft or misuse. Some stakeholders have recognised, in their own assessments, that some IS would be able to maintain such equipment at fire points. This would be a worthwhile option for these IS. This should be determined by the supporting NGO, on a case-by-case basis.

10.4. Recommendations specific to sub-standard buildings and units. The following recommendations apply specifically to SSB/SSU.

10.4.1. SSB/SSU - Prevention and Mitigation

45 - Smoke detectors fitted in all SSB	
Output	• Fit 10 year sealed battery operated detectors • One per household
Outcome	• Early alert of fire, reducing casualties and fatalities
Potential stakeholders	• Shelter sector • MoSA • LCD

Smoke detectors do not prevent fires but they do mitigate risk of fire deaths significantly. After years of working with smoke alarms, the assessment team are able to recommend the most suitable specification of detector that prevents nuisance activations, is tamper proof and comes with a ten year battery. Costs of these detectors are in the region of $10.

These need to be fitted correctly and tested periodically. However, this is not complicated or time consuming. The assessment team recommend that every SSB household have at least one working smoke alarm. In almost all cases only one smoke alarm will be required. Smoke detectors should not be installed to near to kitchens, as they will activate regularly. They should cover a common means of escape such as the corridor or hallway leading out to a front entrance. However, prior to this work, it is advised preconceptions about the use of smoke alarms be changed through education. The assessment team are aware that smoke detection in homes is not widespread in Lebanon.

All shelter technicians and assistants who work in SSB as part of the rehabilitation programme should have awareness training in to how and where smoke alarms are best fitted. Either Operation Florian or the LCD can provide this training.

46 - Home safety checks for all families during initial phase of rehabilitation programme of SSB by Shelter Technicians and Assistants	
Output	• Every family will receive fire safety advice in the home
Outcome	• Save lives • Reduce injuries • Reduce fire risk
Potential stakeholders	• Shelter sector

Currently the rehabilitation programme for SSB requires regular visits by NGO staff to check on home improvements. This provides an excellent opportunity for staff to engage with families, including children, to discuss fire safety advice in the home.

This approach is proven to be successful: Last year, Greater Manchester Fire and Rescue Service delivered over 60,000 home visits last year by operational fire crews. Over the last 10 years there has been a 50 per cent reduction house fires. This is attributed to home visits.

Education can be delivered in these visits with resources such as the 'Fire Safety in the Home' leaflet.[14] Most families have smart phones, so there are further opportunities to use videos that demonstrate the risks of fire development. A documentary video, could be used to recount real stories and the risk of fires.

47 - Fitting handles to existing doors in SSB	
Output	• Every door to have a functional handle fitted • Included in assessment procedures during rehabilitation programme of SSB
Outcome	• Provide safer means of escape
Potential stakeholders	• Shelter sector

SSB rehabilitation inspections should include checking all internal and external doors for door handles. The assessment team witnessed some SSB with no door handles fitted.

Door handles allow the door to be closed correctly in the frame. This reduces the gaps in which smoke will filter into the room. It improves a safe means of escape and allows people to close a door to a fire affected room. This reduces fire development and smoke travel into other areas, which may hinder escape. Being able to correctly close doors can also reduce smoke damage to other rooms.

14 See appendix 7

48 - Separation of rooms with solid, well-fitting doors in SSB	
Output	• Provision of doors particularly on kitchen areas with self-closer as agreed within national minimum standard for rehabilitation programme of SSB
Outcome	• Reduction in fire spread • Barrier to smoke
Potential stakeholders	• Shelter sector • NGOs • UNHCR

The team noticed a general lack of doors in SSB. Those that had been fitted were of poor quality. It is recommended that solid, well-fitting doors are fitted. Some rooms should be prioritised, such as kitchens and rooms used for sleeping. Fire doors are designed specifically for the purpose of providing a barrier when closed lasting up to one hour. Yet even a well fitted simple, solid door will prevent the spread of fire for 15 minutes.

This should be accompanied by safety advice about keeping doors closed as part of a night-time routine, and closing doors on discovery of a fire to limit oxygen supply.

49 - Photoluminescent signs in SSB	
Output	• Prioritised for high rise buildings
Outcome	• Aid escape to occupants
Potential stakeholders	• Shelter sector

People can quickly become disorientated in smoke and darkness. The use of photoluminescent signs to aid escape is mandatory in many countries, even in residential blocks. Signage is inexpensive and should be prioritised in SSB with multiple floors. (This could also be useful in IS with complex escape routes).

10.5. Recommendations to improve capacity of Lebanese Civil Defense

10.5.1. LCD - Prevention and Mitigation

50 - LCD to organise fire prevention training for all NGO staff working in Shelter, Protection and WASH sectors	
Output	• Delivery of standardized training package for all NGO staff
Outcome	• Improve awareness of NGO staff to deliver training in IS and SSB • Reduce demand on LCD
Potential stakeholders	• All NGOs • UNHCR • LCD

It takes time to change perceptions and behaviours regarding hazards and risk reduction. This requires consistent promotion and support by advocates.

As described above the most effective prevention advocates will be Shelter Technicians and Assistants who work in communities. These individuals can identify, understand and educate on risk reduction.

It is recommended that the Civil Defense organise a one day training for NGO staff and this should be a compulsory for those working in shelter, protection and WASH. The elements of the training programme would be developed out of the standardised programme agreed upon during the national workshop.

The Civil Defense should be the lead agency for the delivery of prevention training as well as ongoing support and advocacy for fire safety and prevention to NGOs and communities.

A mobile fire demonstration unit would provide an excellent resource for demonstrating real fires and different fire extinguishing techniques.

Such a unit can be fixed onto a trailer and transported to any location. In the UK these units are usually used to demonstrate the risks of putting water on an oil-based fire. However, this could be adapted for different fires.

Not only could it be used within IS and SSB, but can be used by the LCD for public demonstrations for fire safety campaigns in Lebanese communities.

51 - LCD to carry out an IS 'tour' with a fire safety demo unit	
Output	• Trailer to enable the demonstration of an oil pan fire, danger of electrics and gas cylinders
Outcome	• Safer communities • Raise the profile of the LCD
Potential stakeholders	• All NGOs • LCD

A mobile fire demonstration unit would provide an excellent resource for demonstrating real fires and different fire extinguishing techniques.

Such a unit can be fixed onto a trailer and transported to any location. In the UK these units are usually used to demonstrate the risks of putting water on an oil-based fire. However, this could be adapted for different fires.

Not only could it be used within IS and SSB, but can be used by the LCD for public demonstrations for fire safety campaigns in Lebanese communities.

10.5.2. LCD - Planning and Preparedness

52 - Improved on Personal Protective Equipment and Breathing Apparatus equipment	
Output	• Purchase new PPE and equipment or seek to receive donations as an interim measure
Outcome	• Improved firefighter safety
Potential stakeholders	• LCD

To improve on the personal protective equipment (PPE) and breathing apparatus (BA) there should be significant investment by the Lebanese government to improve safety for all firefighters.

If this is not unachievable at present, an option may be to request donations.

The quality of PPE and BA must be of a safe standard, and that this would be an interim measure to enable time to procure new equipment.

53 - Implementation of firefighting training programme, training of breathing apparatus instructors and developing hot fire training facilities over an 18 month period	
Output	• Training regional breathing apparatus instructors • Development hot fire training facilities • Delivery of tactical ventilation training programme • Training regional breathing apparatus instructors to become compartment fire behaviour instructors
Outcome	• Train all firefighters in safe use and wearing of breathing apparatus • Develop knowledge fire development, flashover and backdraft • Create hot fire training facilities
Potential stakeholders	• Operation Florian • LCD

There should be the implementation of a training programme that trains instructors and develops hot fire training facilities. This would improve firefighter safety, knowledge of fire development and knowledge of urban firefighting techniques.

To achieve this safely would take approximately 18 months in a consistent approach that enables instructor training and development. The recommended phased training programme is in Appendix 6. The skills enhancement required is substantial and in the intervening periods of training there would be an expectation that each person who had received training would be involved in delivering training to firefighters. This would help them consolidate their knowledge in preparation for the next stage of learning.

The first stage
This would be for the LCD to obtained 2 x 20ft shipping containers, which could be facilitated with the assistance of UNHCR. The containers would be converted as compartment fire behaviour units to provide realistic training facilities for fire development, flashover and backdraught training.

There is a desire to replicate the same multi rig training unit as at the UNIFIL training site. However, without the very specific specialist skills necessary it would be dangerous for the LCD to attempt this. Regional instructors would need to be upskilled with the relevant technical skills first and utilising the UNIFIL site in combination with the creation of compartment fire behaviour units would the first step forward.

Operation Florian has the necessary expertise and technical capacity to assist with the design and construction of the training units and develop the necessary risk assessments and safe operating procedures.

The second stage
This would be to deliver a breathing apparatus instructors course to LCD regional instructors. The UNIFIL multi rig and the compartment fire behaviour units would provide the correct level of safe training required.

Once this completed there would need to be a period in which new instructors deliver training and provide practical evidence to demonstrate how they have consolidated their learning to take them forward to the next stage.

The third stage
All technical rescue units have positive pressure ventilation fans there would need to be a further specialised course. This cannot be achieved without the preceding courses, as practical and technical knowledge is a pre-requisite for undertaking such a safety critical elements of training.

The final stage
Compartment fire behaviour instructor training would be need to be delivered so that regional instructors can instruct all firefighters safely in the hot fire training units.

The above format is recommended due to the technical nature of the undertaking. This would help the LCD develop response capacity and provide safe working and training conditions.
Appendix 10 provides an outline for a proposed budget for training to provided by Operation Florian if requested. It must be stressed these are outline costs and may vary on account of exchange rate at the time or on the basis of further discussions. They do not include the cost of use of the UNIFIL training site or any training costs related to the LCD.

It is absolutely imperative that Lebanon has such facilities available to all firefighters. It would be strongly recommended that opportunities for assistance provided by Operation Florian, or other specialist in this area, are arranged. This provides the opportunity to share technical expertise and develop safe systems of work within the operational scope of such specialist facilities.

54 - Implementation of national operational procedures for the use of breathing apparatus	
Output	• Development of national operating procedures for all firefighter
Outcome	• Improved firefighter safety
Potential stakeholders	• Operation Florian • LCD

Currently, there is no National Operational Procedures for the safe wearing and use of breathing apparatus at operational incidents.

In the UK national guidelines for BA have been produced by central government known as Technical Bulletin 1/97. This has recently been surpassed by a document called Operational Guidance for Breathing Apparatus.[15] It is highly recommended that the Civil Defense review each document and develop national guidelines relative to Lebanon out of each document. This could be accomplished with the assistance of Operation Florian.

10.5.3. LCD - Response

The assessment team believe that response capacity and time of response can be improved. This would reduce risk of fire spread and damage.

55 - Utilise existing rapid response vehicles and forest firefighting vehicles with 4 x 4 capability	
Output	• Obtain agreement from donors to use vehicles for fires in IS • Relocate vehicles on the basis of risk analysis and greatest need
Outcome	• Improved response to fires in rural areas or poor road conditions
Potential stakeholders	• LCD

There are vehicles that could be relocated to areas of greater need, or other vehicles need to be prioritised for repair to improve overall response.

The assessment team were informed that many of the donated vehicles had been donated specifically for forest firefighting. Therefore, it would be advisable for the LCD to contact donors and seek approval that donated vehicles can be used for the additional purpose of attending fires in IS and SSB. The assessment team do not believe that this would be an issue for donors considering severity of the humanitarian situation regarding fires in IS.

15 This document is available online: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/271157/131230-Operational_Guidance_Breathing_Apparatus__Web.pdf

56 - Purchase or receive donation of fire vehicles with high pressure pumps	
Output	• Improved firefighting capacity with high pressure pumps • Provide safe training for hot fire training facilities
Outcome	• Improved firefighting capacity • Minimise water use during firefighting operations
Potential stakeholders	• LCD • UNHCR • Operation Florian

It is highly recommended that if the intention for the Civil Defense is to develop hot fire training facilities. These should allow for flashover and backdraft training, and this required firefighting vehicles with high-pressure pumps be available. Low and medium pressure pumps are ineffective for hot fire training.

High-pressure pumps are more effective and have more efficient water supply usage. This is necessary for improving firefighting where water supply is limited.

Currently, the water tankers are fitted with medium pressure water pumps. These are not sufficient for fighting fires that reach a high level of fire development or flashover in urban fires. Medium pressure pumps will not produce the water pressure or water droplet size required.

It is considerably high risk to train firefighters in hot fire training without such pumps. Current UK fire vehicles with high-pressure pumps would be satisfactory. If UK fire vehicles were donated they would provide the effective pumping capacity, pressure and speed. However, they would suffer similar limitations regarding effectiveness on rough terrain. These would also not be suitable for and in some locations of Lebanon that are exposed to high levels of snow.

It is also unknown by the assessment team what legislative restrictions there are regarding right hand drive vehicles. If such vehicles were to be donated then the LCD need to be aware that these would some driving challenges.

Nonetheless, vehicles donated by the UK could provide an important role in significantly improving the firefighting capacity at IS and SSB.

11. Appendices

Appendix 1: Assessment visit itinerary

Date	Activity
29-07-16 F	• Arrive Beirut • Safety and security briefing • Tavel to Akkar
30-07-16 S	• Akkar fire station • Field visit to IS minea 029 • Field visit to IS minea 022 • Field visit to IS Aarqa 017 • Field visit to IS Sammomye 084
31-07-16 S	• Field visit to IS Quahra 020 • Field visit to Bire housing complex and site of house fire • Field visit to Bire housing complex to look at incomplete and complete rehabilitation houses • Travel back to beirut
01-08-16 M	• Meeting with General Khatar, General Director of Civil defence • Visit to Beirut Fire Station and meeting with Nabil Salhani Civil Defence Consultant • Meeting with 2 commercial vendors; 911 for safety and Security and • Meeting with Norwegian Refugee Council -Anna Hirch- Holland (Camp Management Project Manager) and Jeroen Quanjer • Meeting with Save the Children -Dana Shdeed and Rayan Hajj
02-08-16 T	• Meeting with UNHCR Shelter Coordination -Lahatra Rakotondradalo, Shelter Officer • Meeting with Shelter Advisor, Ministry of Social Affairs -Ahmad Kassem • Meeting with UNHCR Health Sector -Dr Michael Woodman, Health Officer • Meeting with Première Urgence -Aide Médicale Internationale (PU-AMI) -Arnaud Fratini • Meeting with Core Shelter Sector Steering Committee
03-08-16 W	• Travel to Bekaa Valley SCI regional office • Received field safety and security briefing • Visit Bekaa Valley Regional Fire Station in Zahle • Field visit to scene of fire in IS • Field visit to IS -Haouch El Rafka- 007 • Field visit to IS Balbeek Al Alaviad 01-031-5311 • Meeting with SCI Deputy Area Manager, Rodney Chamoun
04-08-16 T	• Field visit to Qab Elias to inspect 2 SSBs • Field visit to IS Taanayel 001 facilitated by MEDAIR to observe fire extinguisher training • Meeting with SCI Shelter Manager Nabil XXX and Shelter Assistants, Hussein Mohammad Abdul Khalek, Mohammad Suhail Alkhatib • Meeting with Fire Chief and firefighters at Bekaa Valley
05-08-16 F	• Meeting with MEDAIR • Meeting with Nick Winn, NRC -Shelter Coordinator (SSBs) • Meeting with Bobby Baker, UNHCR Shelter Officer, Bekaa Valley • Meeting with Marta Ricci (Protection Coordinator) and Tharwat Nazha (Awareness Coordinator) GVC
06-08-16 S	Handover to George / Joanne		
07-08-16 S		Rest	
08-08-16 M	1- Meeting with Nabil Salhani Civil Defence 2- Meeting UNHCR BML team, UNHCR health team	George, Joanne, Dana, Rayan	
09-08-16 T	Field Visit to Beirut Mont Lebanon 2 IS, 1 SSB, local fire station	George, Joanne, Rayan	Coordinate with Acted
10-08-16 W	Field visit to the South, 2 IS, local Fire station Meeting with Lebanese Red Cross	George, Joanne, Rayan	Coordinate with PU-AMI
11-08-16 T	Validation Workshops	George, Joanne, Rayan, Dana	
12-08-16 F	Verification and fact checking, preliminary recommendations	George, Joanne, Rayan, Dana, FRR committee	

Appendix 2: Recommendation 1. Example of mission statement for National Fire Committee/Working Group

Our Mission
Working together for a safer refugee population

Our Mission Statement
Working together we will provide the highest standard of community fire safety and emergency response services to the refugee communities within Lebanon.

Our Aim
We will work with the refugee communities in Lebanon to reduce risks to life, property and the environment from the hazard of fire.

We firmly believe that by far the best way of protecting those we serve from fire hazard is to prevent that emergency before it happens. Prevention avoids suffering and harm. It also reduces the demand on other services, saving the communities money.

Our Objectives
We will reduce risk by educating our communities to prevent fires occurring

Working with our partners, we will improve the safety of these communities by identifying those most vulnerable

We will collaborate, and share information to prevent, mitigate, plan and prepare for the risks presented by fires

We will support each other in delivering measurable educational projects that target those most at risk

We will improve our investigation of fires and record vital data in order to reduce such incidents

What will success look like?
There is a reduction in the number of fire calls within those targeted communities

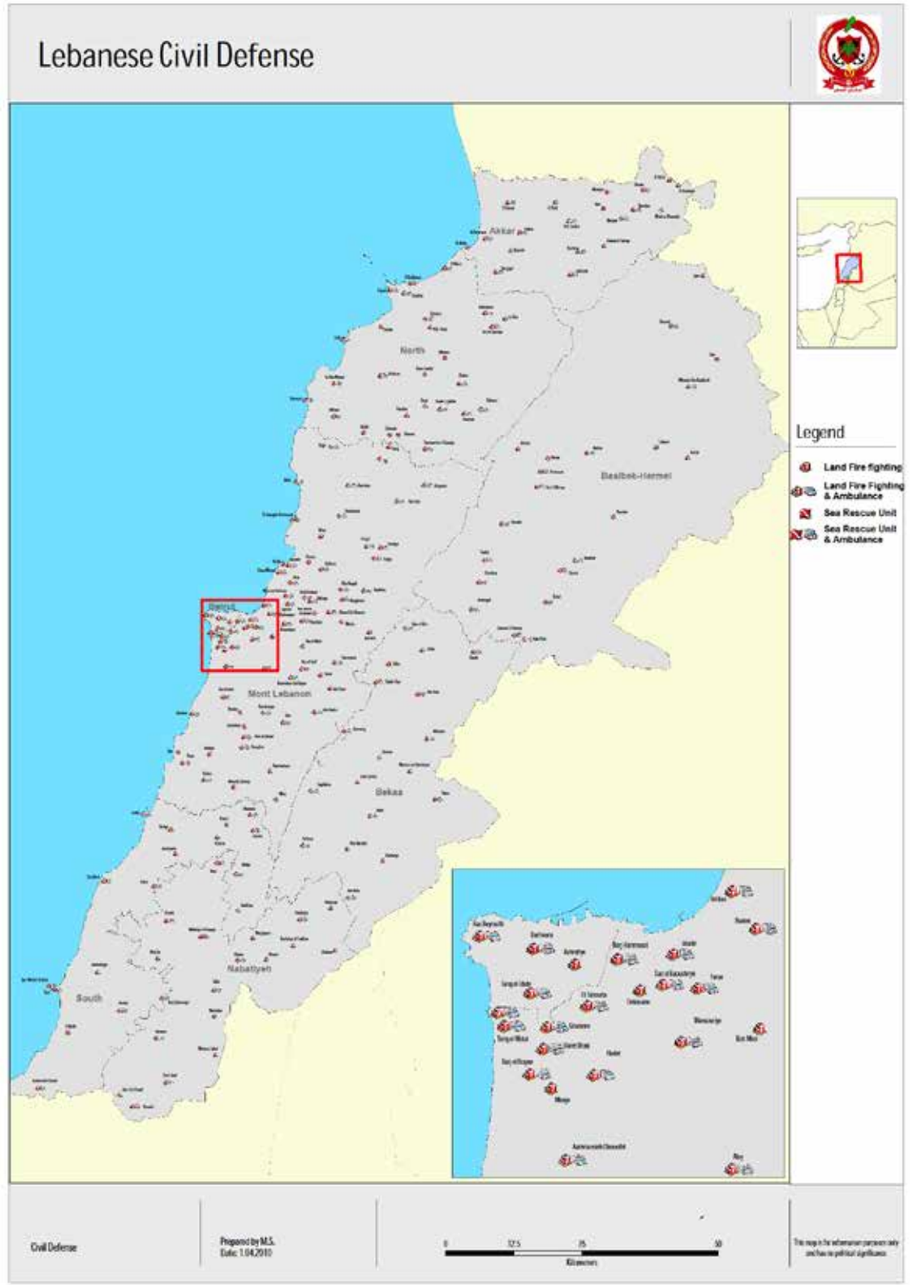
Civil Defense firefighters are better prepared. They know more about where the communities reside, who the most vulnerable persons are and NGO agencies who are able to support them

Projects are sustainable, with clear outputs and outcomes

Standardised home fire safety assessments are delivered to all those in need

Data analysis allows us to target our projects and achieve greater success

Appendix 3: Map of location of fire stations in Lebanon



INFORMAL SETTLEMENTS, LEBANON

OPERATION FLORIAN TEAM
***INCIDENT GROUND* ANALYTICAL RISK ASSESSMENT**
Version 1.1 August 2016

Address Various locations visited

Risk assessment completed by …….George Bryant

Date 28th August……..... Sheet ……1……. of 2……..…...

GENERIC ASSESSMENT [x] **SECTOR ASSESSMENT** [ ]

SECTOR No/name [ ]

SEVERITY (S)	LIKELIHOOD (L)				
5	5	10	15	20	25
4	4	8	12	16	20
3	3	6	9	12	15
2	2	4	6	8	10
1	1	2	3	4	5
X	1	2	3	4	5

Please keep a copy

Where Risks are High or Very High inform the Project Leader immediately

Severity Rating (S)

1.INSIGNIFICANT – No Injury
2.MINOR – First aid only
3.MODERATE – Hospital treatment required
4.SIGNIFICANT – Permanent disability/fatality
5.CATASTROPHIC – Multiple fatalities/ Large-scale hospitalisation of casualties

Likelihood Rating (L)

1.RARE – May occur in exceptional circumstances
2.UNLIKELY – Will seldom occur
3.POSSIBLE – May occur
4.PROBABLE – Will often occur
5. HIGHLY PROBABLE – Near certain

Hazards	Who is at risk?	Existing control measures	S 1-5	L 1-5	Total S x L	Risk	Control measures adequate? Y/N
poor wiring leading to short circuit	Inhabitants & neighbours	Ad hoc use of insulation tape, wires raised on wooden poles & some circuit breakers, some DP extinguishers, awareness training	5	4	20	VH	NO
Unattended cooking accident	Inhabitants & neighbours	Few examples of cooking carried outside or in sterile space, stoves on raised platforms on occasion, backplates, flat surfaces for stoves, lighting, some DP extinguishers and fire blankets seen	5	4	20	VH	NO
Gas leak from LPG cylinder/connection/hose leading to ignition	Inhabitants & neighbours	Pressure relief valves on cylinders (integrity of cylinders questionable, often repainted in unofficial colours, hose perished, no proper securing clips, blocked burners)	5	3	15	VH	NO
Candles- falling over or igniting other material	Inhabitants & neighbours	Candle holders or plates, fire safety awareness training covering best practice, DP extinguishers on some sites	5	3	15	VH	NO
Smoking materials- lighters	Inhabitants & neighbours	Some parents had identified the risk and instructed the children appropriately (but there were examples of lighters in reach of young children)	5	3	15	VH	NO
Dwelling fire-deliberate act	Inhabitants & neighbours	Some DP extinguishers	5	3	15	VH	NO
Burning of waste leading to fire spread to dwellings	Inhabitants & neighbours	Some local awareness of risk, DP extinguishers on some IS sites	5	3	15	VH	NO

RISK	1-3 TOLERABLE No Further action - monitor	4-8 MODERATE Reasonably satisfactory - minor actions required	9-14 HIGH Unsatisfactory - immediate action required	15-25 VERY HIGH Unacceptable - take immediate action

SUB STANDARD BUILDINGS, LEBANON

OPERATION FLORIAN TEAM
ANALYTICAL RISK ASSESSMENT
Version 1.1 August 2016

Address Various locations visited

Risk assessment completed b…George Bryant

Date 28th Augus..... Sheet ……1……. of 2……..…...

GENERIC ASSESSMENT [x] **SECTOR ASSESSMENT**

SECTOR No/name [ ]

Where Risks are High or Very High inform the Project Leader immediately

Please keep a copy

SEVERITY (S)	LIKELIHOOD (L)				
5	5	10	15	20	25
4	4	8	12	16	20
3	3	6	9	12	15
2	2	4	6	8	10
1	1	2	3	4	5
X	1	2	3	4	5

Severity Rating (S)

1.INSIGNIFICANT – No Injury
2.MINOR – First aid only
3.MODERATE – Hospital treatment required
4.SIGNIFICANT – Permanent disability/fatality
5.CATASTROPHIC – Multiple fatalities/ Large-scale hospitalisation of casualties

Likelihood Rating (L)

1.RARE – May occur in exceptional circumstances
2.UNLIKELY – Will seldom occur
3.POSSIBLE – May occur
4.PROBABLE – Will often occur
5. HIGHLY PROBABLE – Near certain

Hazards	Who is at risk?	Existing control measures	S 1-5	L 1-5	Total S x L	Risk	Control measures adequate? Y/N
poor wiring leading to short circuit, also exposed to elements such as rain	Inhabitants & neighbours	Ad hoc use of insulation tape, wires on outside of buildings or up stairwells, some circuit breakers, some DP extinguishers, awareness training	5	4	20	VH	NO
Unattended cooking accident	Inhabitants & neighbours	Few examples of cooking carried outside or in sterile space, stoves on raised platforms on occasion, backplates, flat surfaces for stoves, lighting, some DP extinguishers and fire blankets seen	5	4	20	VH	NO
Gas leak from LPG cylinder/connection/hose leading to ignition	Inhabitants & neighbours	Pressure relief valves on cylinders (integrity of cylinders questionable, often repainted in unofficial colours, hose perished, no proper securing clips, blocked burners)	5	3	15	VH	NO
Candles- falling over or igniting other material	Inhabitants & neighbours	Candle holders or plates, fire safety awareness training covering best practice, DP extinguishers on some sites	5	3	15	VH	NO
Smoking materials- lighters	Inhabitants & neighbours	Some parents had identified the risk and instructed the children appropriately (but there were examples of lighters in reach of young children)	5	3	15	VH	NO
Dwelling fire-deliberate act	Inhabitants & neighbours	Some DP extinguishers	5	3	15	VH	NO
Lack of doors or damaged doors (both without handles)- doors reduce fire and smoke spread, handles aid escape	Inhabitants & neighbours	Doors being replaced or added through NGO intervention, handles included	5	3	15	VH	NO

Appendix 6: Fire incident reporting template

House Number/location/sector .....

What date did the Fire Start? ...../...../..... What time?.....

Wind Direction..... Speed.....(approximately) Weather conditions.....

What room did the fire start in.....

Describe the circumstances that led to the fire.....
.....
.....
.....

How long was it between the fire starting and its discovery.....

How long between discovery and the fire being extinguished.....

How many dwellings were burnt by the fire spread (partial and fully destroyed).....

How many other houses were demolished to prevent fire spread.....

How many people assisted in putting out the fire.....

How many people were hurt. Occupiers .....How? Burnt/Smoke inhalation/Other

Describe the injured (age, gender, reasons for injury, health issues, mobility issues, intoxicated?).....

How many people were hurt. Fighting the Fire..... How? Burnt/Smoke inhalation/Other

How many persons died in the fire? Please profile the person(s)
.....
.....
.....
.....

Fire risk reduction assessment of vulnerable Syrian refugee populations in Lebanon
Operation Florian, September 2016

.....
.....

Please provide information on the occupants where the fire originated (age, gender, reasons for injury, health issues, mobility issues, intoxicated, smokers etc).....
.....
.....
.....

How many people have been left homeless.....

What equipment was used (How many items) buckets of *sand, Beaters, Roof Hooks, fire extinguishers*

Other explain.....

How much will it cost to repair the damage (Approximately) .....US Dollars

Who was the Fire reported to?..... (Local Leader/NGO/ Civil Defence/Lebanese Red Cross)

How long was it from the time the Civil Defence were called to the time they arrived at the scene? (approx).....

What measures have been put in place to prevent another Fire starting.....
.....
.....
.....

Is the cause of the Fire known.....Yes/No (If No what is the most likely cause and why?).....

.....

Did anything contribute to the fire spread? For example fuels, gas, plastics.....
.....

Name of person reporting Fire.....Camp site Address/location .....

.....***(Put any other useful information on the back of this form)***

Sketch of the environment (include dimension)

Use the box on the left to represent the dwelling involved in the Fire. Mark on it:

The size of the building in Meters ⟷

The Wind direction

Where the fire started

The extend of Fire damage

The extend of Smoke damage

Appendix 7: List of recommended resource materials

Fire Safety in the Home: UK leaflet which provides tips and advice about how to protect home and family from fire, and what to do should a fire break out. This is available in Arabic. This was shown to the Lebanese Civil Defense and humanitarian agencies during the field assessment, and was deemed a good resource that could be adapted to the Lebanese context, for IS and SSBs/SSUs.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/475164/Fire-Safety-in-the-Home.pdf

Francis the Firefly: Children's story about the dangers of fire, used in the UK. This was also shown to the Lebanese Civil Defense and humanitarian agencies and received positive feedback. This would need translating/adapting and could be used amongst agencies working directly with children and families, use in child friendly spaces, and key messages adapted for animators, incorporation into educational activities/ mobile libraries

https://www.manchesterfire.gov.uk/media/1743/francesfirefly.pdf

Series of YouTube videos on Fire Safety in Refugee Camps produced by the International Organisation for Migration Middle East and North Africa: Good example of potential use of media to convey fire safety messages. These would need adapting for the Lebanese context. Coordination with UNHCR communications staff and those already carrying out media production with refugee communities to produce short films that could be disseminated via Facebook/WhatsApp/community screenings/child friendly spaces/schools.

https://www.youtube.com/watch?v=TAkG9ZoJy6o

https://www.youtube.com/watch?v=tlWl07lywVk

https://www.youtube.com/watch?v=maEgjw7uEcc

https://www.youtube.com/watch?v=maEgjw7uEcc

Save the Children leaflets: These need to be redesigned to include more pictorial representations/ instructions in order to be more accessible. It would be beneficial to coordinate across all agencies to produce one standardised leaflet, using this as a template.

Injury and burns prevention

Graphics which can be used to create awareness of 'stop, drop and roll'

An example of a First Aid for Burns treatment poster which can be obtained off the internet and translated to be distributed or used as a training resource.

Appendix 8: Case Study – Fire in ground floor accomodation in Bire Village, Akkar Region

Background

On Sunday 31st July the Operation Florian team, consisting of Steve Jordan and Laura Hirst, visited Bire Village which is the site of numerous substandard and incomplete buildings which are being occupied by many refugee families.

The team had specifically been taken to this site as there was a reported fire that had occurred a week previous on Tuesday 26th July which nearly killed all 5 occupants and had completely gutted the ground floor apartment causing considerable damage to furniture

The fire had occurred in the front room next to the front door which blocked the main means of escape. There was a ground floor bedroom window. As the apartment was on the ground floor all windows had security bars which had been fitted and secured into the concrete which formed the window frame. This seriously affected the means of escape of the family trapping them in the bedroom. If it was not for the response by the community and efforts to rip the security bars out of the frame the family would have died.

On account of the contents of the front room there was considerable fire loading to cause rapid fire and smoke development. As an addition in the kitchen there was a LPG cylinder which ruptured causing a gas leak and intensifying the fire.

Both adults did however suffer from considerable smoke inhalation and were given medical treatment by the Lebanese Red Cross who was called to the incident.

The Fire Service was called out but arrived about one hour after the fire was reported in which point the fire was almost out.

At the time of the field visit the family were in the process of redecorating and and replastering the walls to be able to gain access and live in the apartment as soon as possible. The team interviewed both Wassim and Yasmine to try to establish a time line of the incident and the fire development and what actions they took to keep the family alive.

It was immediately evident that both parents especially Yasmine was still traumatised by this incident and it would be hoped that this case study could be used as an opportunity to stress the need for all NGO's, stakeholders and refugees to understand the need for fire awareness and fire safety training in the home.

Description of building and apartment layout

The building visited was a large building consisting of approximately 4 floors divided into to a number of small apartments currently being rehabilitated with the support of the Save the Children Shelter team. The building as a whole was in varying stages of development but was occupied by a large number of families. The building construction is typical to most buildings with a concrete structure with brick built walls.

The apartment as detailed in diagram 1 has 4 rooms; front room, kitchen, bathroom and bedroom. The front room were the fire occurred had a sofa by the window, TV in the corner and two further chairs along the adjacent wall. There was also a rug on the floor. The window in the front room was covered with plastic sheeting used as a curtain and this draped down to the floor.

Each room had a wooden door and all doors at the time of the fire these were open. In the kitchen next to the door frame was positioned the LPG gas cylinder and cooking stove.

The bedroom was fully furnished with a bed and wardrobe where both adults and children slept.

The bathroom was a standard bathroom with toilet and shower with a window which was small and positioned about head height with security bars.

Occupancy

The apartment was occupied by a family of 5 residents; 2 adults (Wassim and Yasmine) and their 3 young children believed to be 2, 3 and 4 years old.

Cause of the fire

The fire was caused by a scented candle. This candle was used to stop bugs or insects entering into the apartment and had been placed by the front entrance door the previous night and was still burning in the morning.

At around 8am in the morning when both parents were still asleep in bed the children were playing in the front room. It is believed the youngest child had moved the candle away from the door and closer to the sofa by the window. This placed the candle close to the plastic sheeting which then ignited.
Plastic sheeting can ignite extremely quickly and cause rapid burning. A further major hazard is that when it melts it disintegrates dropping melting and burning plastic on to whatever is underneath or in close proximity. In this scenario the sofa was underneath which would have caused a rapid ignition of the sofa.

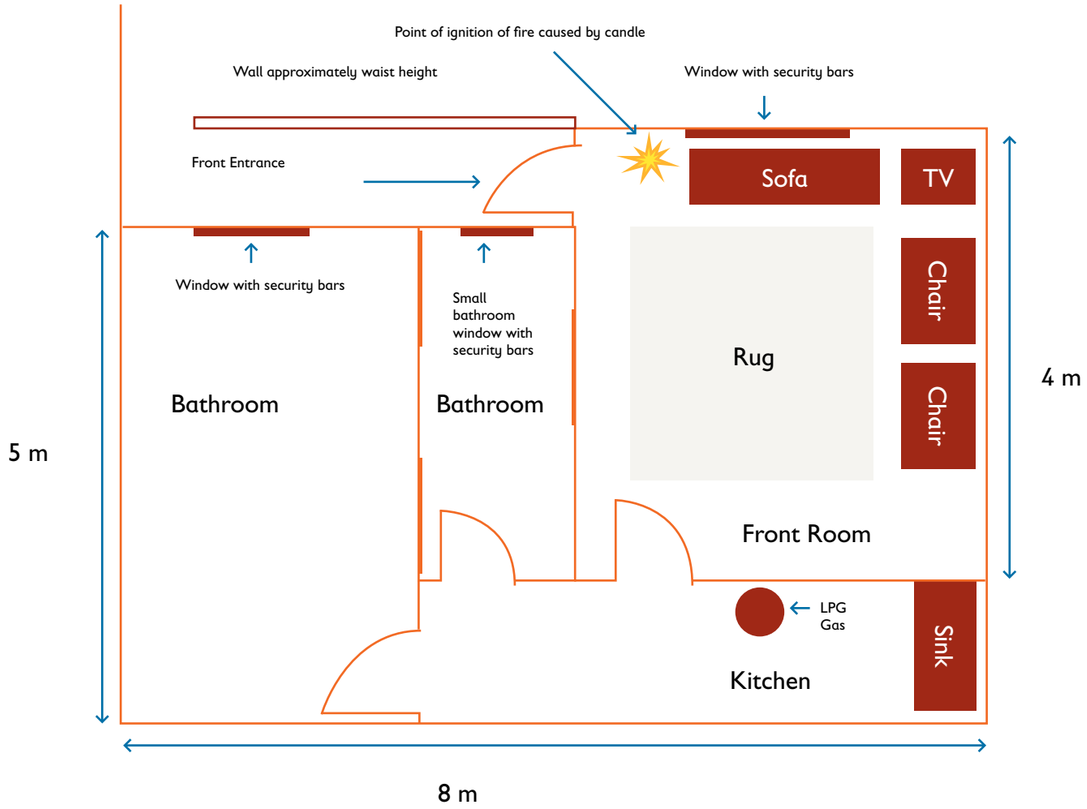


Diagram 1: Layout of apartment

Stages of fire development

It is not entirely clear to establish how long the fire had to develop but not long after the ignition one of the children ran into the bedroom to wake their parents and tell them about the fire.

When Yasmine woke and went to investigate. When interviewed based on her description when she came out of the bedroom she saw smoke in the kitchen area and hallway and when looked into the front room it was full of smoke and hard to see, as detailed in diagram 2, but it was evident that the fire was large and the heat was intensive. This would indicate considerably rapid rate of fire development.

Yasmine retreated into the bedroom immediately calling all the children in. Yasmine did not close the door to the front room door when retreating back to the bedroom. Based upon her description the heat was to intense and the room was full of smoke.

However, if Yasmine had crouched down this would have reduced the impact of the heat felt and increased visibility enabling her to close the door. Closing the door would have been beneficial to restricting fire growth, spread of the smoke and decreasing the rate of temperature in the adjoining rooms such as the kitchen and bedroom.

By keeping both the front door and the door adjoining to the kitchen open there would have been sufficient ventilation to cause rapid fire development and an increase in the heat layer at ceiling level. This would have inevitably radiated heat downwards upon to the surfaces of other pieces of furniture such as the TV and sofa. This would have raised temperature of all exposed surfaces to the point of auto-ignition causing further combustion in the room contributing to further heat and smoke development causing the room to be fully involved in fire.

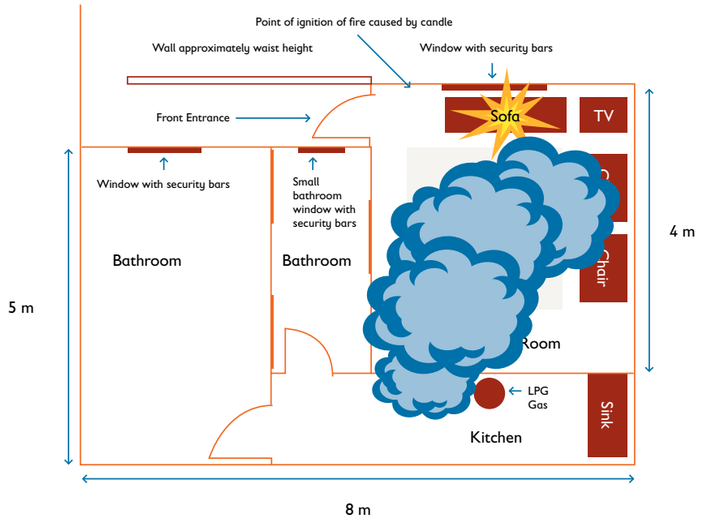


Diagram depicting fire development and volume and capacity of smoke when mother had gone to inspect the fire based on witness testimony

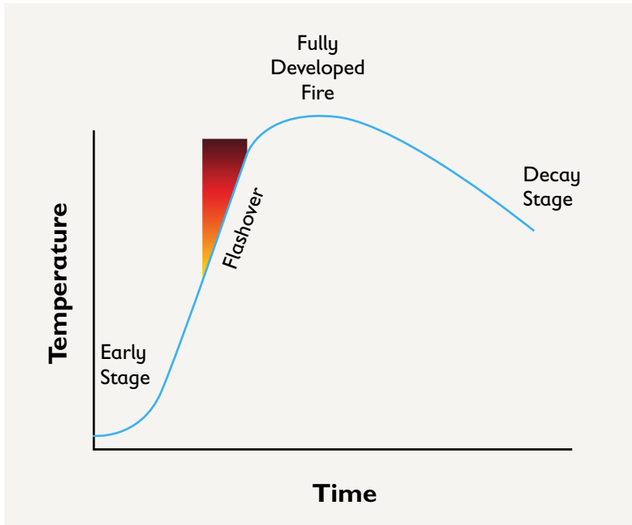


Diagram of stages of fire development indicating heat intensity against rate of development

Next stages of fire development and actions undertaken by family.

As the fire intensified and the smoke began to travel into the kitchen, bathroom and bedroom. The family retreated into the bedroom in a state of panic.

The father then closed the bedroom door but according to his descriptions smoke was seeping through the gaps in the door frame and underneath the door. When asked if placed anything under the door it was confirmed this did not happen.

As part of fire safety in the home awareness training basic safety precautions involved placing bedding at the bottom of the door to reduce smoke entering the compartment increasing survivability time.

Immediately, a further panic ensued as the parents could not find one of the children. Believing them to be still in the room the father was about to go back into the fire compartment when fortunately they found the child under the bed. This is a common behavioural trait for children to hide under beds or in cupboards during fires when panicking.

The family then began screaming out to attract the attention of neighbours to help which arrived very quickly. However, the family were trapped in the room on account of the security bars. The neighbours then began to trying to remove the bars whilst in the meantime the bedroom was beginning to fill rapidly with smoke.

According to the description of the family the LPG gas bottle in the kitchen exploded. Upon investigation of the apartment and analyse of photographs taken in the immediate aftermath it is unlikely and explosion would have occurred as there would have been greater damage caused to door and window frames pushing them out of their frames on account of the potential blast and pressurisation of the compartment. Equally there was no evidence of a ruptured cylinder which would have clearly indicated an explosion. However, it is believed that the gas cylinder would have been exposed to consider heat affecting the valve and purging gas and igniting the leak causing a large noise in the process.

After a few minutes the bars were ripped out of the window frame and the family were assisted in their escape. However, all the members of the family were suffering from smoke inhalation.

It is not known at what point or by who the emergency services were called. However, it is believed the Lebanese Red Cross were called first and they may have called the fire service. The Lebanese Red Cross provided first aid treatment on scene with oxygen therapy to the family and after 30 mins the fire service had arrived to extinguish the fire. At this point the fire was in the decaying stage as all the furniture.

Concluding remarks

It is inevitably tragic that such a fire caused tremendous damage and clearly the family had suffered a traumatic incident which was still clearly evident with the mother. Fortunately the family was saved and despite all suffering smoke inhalation there were no further burns treatment.

Upon review of this incident it does indicate to the evaluation team that if basic fire precautions and fire safety awareness training had been delivered the fire could have been avoided or fire damage could have been reduced.

If provided with the correct level of training and awareness Shelter Technicians could work with the family to discuss;

- Fitting a smoke detector for early detection, raising the alarm and protecting the means of escape at an initial stage of the fire development,
- Highlighting the need to maintain an escape route and being aware of escape plans,
- Discussing candle safety and extinguishing any candle before going to bed,
- Staying low during a fire and keeping below smoke layers which improves visibility and improves opportunities for more breathable air,
- Closing doors on rooms which are on fire this restricts the ventilation to the fire and reduces the speed of fire development and spread. It also reduces the travel and accumulation of smoke into other rooms which can cause further considerable cosmetic damage.
- When retreating into a room of safety placing materials at the bottom of the door to reduce entering the room,
- Immediately calling the emergency services,
- Working with children to educate about the awareness of the risks of fire.

All of the above would not have taken much time or resources to have been delivered by a Shelter Advisor during one of the many visits.

Further consideration should be given to post fire invention work with the other families within the building. Clearly this was an emotional situation for all involved and it is an opportunity to offer psycho-social support and reassurance at a time when many feel considerably vulnerable . At such a moment it can reinforce the delivery of key fire safety measures and awareness to reduce risk and possible further fire occurrences.

Recommendations

- All Shelter Technical Assistants and Advisors receive fire safety in the home training which can be passed onto families during various on-site visits.
- Development of fire safety leaflets and safety poster to be placed on the wall in apartments to reinforce message.
- Fit smoke alarms in all Sub Standard Buildings
- Produce an educational film by SCI with the permission of the family to highlight and share their personal experiences and what they have learnt from this experience.

Appendix 9: Beqaa Valley Sub National Fire Safety Working Group: Fire Safety Minimum Guidelines Draft

Fire Safety Minimum Guidelines DRAFT

INTRODUCTION

Drafted April-June 2016, this document contains input from all Beqaa fire safety partners, including archived information about fire safety interventions since 2012.

This document of minimum guidelines is subject to change as the Shelter sector gathers new information and updates its strategies See section 10.0 for how to edit document.

PURPOSE

GOAL: Decrease refugee morbidity and vulnerability in settlements due to fire.

OBJECTIVE of document: Synchronize the way NGOs intervene in refugee settlements in order to:

- Ensure that all partners use best practices
- Improve the quality of intervention and refugees' understanding of key messages
- Improve partners' credibility with refugees by intervening similarly to all other partners
- Address the key issues/problems (listed in the latter half of this Introduction) in fire safety

HOW TO USE GUIDELINES: See shelter partners' long-term response coordination in section 10.0.

ISSUES AND PROBLEMS IN FIRE SAFETY AMONG SETTLEMENTS

Before describing the guidelines of fire safety planning, this section lists the challenges and problems that the partners mentioned to hinder fire safety efforts. This document offers solutions for all of these issues.

- How can we best check behaviors of refugees after interventions and prohibit them from selling fire extinguishers? Are refugees acting on the lessons from training?
- Many refugees do not take fire safety seriously; the challenge is promoting a sense of ownership/ behaviour change
- What are refugees' most relevant needs for addressing fire safety?; level of vulnerability
- How to simplify fire extinguisher servicing/checkup processes; documenting various expiration dates; quality, reporting of use
- How to receive referrals/concerns
- Consistency of key messaging/visibility/ processes between NGOs (e.g. some NGOs just drop off the FEs without training; ruins NGO credibility among beneficiaries); confusion about what works
- Fraud for returned FEs
- Large settlements need special attention
- Refugees understand fire safety but don't do anything about it i.e responsibility
- Electricity overuse/ too many steal electricity from one source (political); poor/dangerous connections
- Modalities (how many extinguishers, materials etc)
- Ability to share FEs: some tents are locked
- Regulatory barriers, shelter materials and site planning restrictions

SYNCHRONIZED STEPS IN FIRE SAFETY INTERVENTIONS

At bare minimum, partners plan to coordinate the following areas of fire safety planning. This section simply lists these elements, and the subsequent sections describe them in more detail.

Planning before Intervention

1. NGO personnel
2. Pre-intervention in settlements
3. Procurement of "F-kit"

The Intervention

4. Modality
5. Fire Safety Training
6. Materials/Visibility
7. Refugee ownership tactics

After Intervention

8. Post-Distribution Monitoring
9. Fire extinguisher management
10. NGO long-term role

Emergency Response

11. Post-Fire follow-up

Annex

A. Fire risk management
B. Visibility materials
C. Training tools

1.0 NGO personnel

This section outlines the staff preparation necessary for conducting a comprehensive fire safety training, as well as what they should learn to do.

Fire Safety staff should be trained to fulfil the following roles:

TOPIC	MINIMUM STANDARD	FOR CONSIDERATION
Community Mobilization (how to prepare the community before intervention takes place)	- Communicate with other partners: ensure zero overlap - Check with CSMC to find existing committees/ focal points; where unavailable, the CSMC can guide the NGO how to choose the focal points (see section 7.0) - How to communicate purpose and importance of intervention - Familiarity with Messaging in section 2.0	- How to set up a multi-gender training - Trained in safety: how to handle issues with refugees who are not happy with the fire extinguisher modality and/or training
Assessment	Use guidelines from section 2.0	Trained in how to conduct safety risk assessment Consider easing the hazards for tents "locked" within a labyrinth of other tents (e.g. helping create more exits) Review fire risks from section A. of the ANNEX
Fire Safety training, distribution	How to train refugees in fire prevention and fire fighting, using techniques in section 5.0; must include: - How a fire starts (review ANNEX section A. fire risks) - List of key issues/problems in the settlements (see Introduction of this document) - How to use and service a fire extinguisher - Review Modality section 4.0 See ANNEX section C: training tools	- Trained in training techniques: some trainers do not properly engage with the trainees, rendering a useless training - Ask other fire safety partners who have slide shows for training trainers - How to train genders differently / Child safeguarding - How to conduct focus groups among all genders - How to follow-up with community focal points
Post-Training and Post-Distribution Monitoring	Learn questions in section 8.0 Post-Distribution Monitoring Communicate monitoring plans to site focal point/ community group	How to conduct surveys or focus groups to monitor the effectiveness of the training and fire safety items Training in proper note-taking; gender sensitivity training for research

2.0 Pre-intervention in settlement

This section outlines the information to collect and preparations to make before intervening with fire safety messaging and distributions.

Refer to section 8.0 (PDM questions) as a guide for assessment questions, since they should be the same to allow for proper monitoring.

TOPIC	MINIMUM STANDARD	FOR CONSIDERATION
Who to contact (which settlements to prioritize and who to engage when first contacting settlement)	Municipality – inform them of intervention and purpose, and get their input (pass ownership to them) If resources and time run short, do not stop intervening; instead, prioritize certain key settlements: - Settlements with 20+ tents - Congested settlements - Settlements close to fields (in summer) - Settlements with history of fire/fires Within the settlement, <u>contact the existing community group/ focal point to prepare for intervention</u>, or establish a group to oversee fire safety. Contact your CSMC partner to find these groups, and/or how to work with settlements without them.	Lebanese Red Cross and Civil Defense – inform them of intervention and purpose, and get their input (pass ownership to them)
Messaging (What to tell the settlements before conducting fire safety intervention)	A training will take place, and all recipients of the fire extinguisher must attend, at minimum. - The NGO will distribute fire extinguishers, but not to everyone (see section 4.0 to explain modality) - Explain the Major issues/problems related to fire safety in settlements (see Introduction for this list)	"We invite all the people who will most likely be in the home, especially women." Ideally, everyone in the settlement should attend the training
Assessment questions before intervention (for monitoring & evaluation)	Ask the same questions before and after intervention for proper M&E -- refer to section 8.0 for the list of questions Assess greatest fire risks in settlement to know what to emphasize in training. See ANNEX section A. to identify major risks.	Adapt F-Kit distribution (see section 3.0) to the risk assessment (e.g. if there are many exposed wires, distribute electrical tape)

3.0 Procurement of "F-kit" materials

When conducting a fire safety intervention, experience has proven that only the people receiving fire safety kits are the only ones who attend training. Obviously, all people in the settlement should know the elements of fire safety; therefore consider adding items to your Fire Safety Kit to distribute to all trainees, even the non-FE recipients.

At minimum, all partners should distribute **6kg fire extinguishers** -- along with notification stickers/ spray paint (see section 6.0) posted near the fire extinguisher – in order to reduce conflict among settlement leaders who claim that "some settlements get fire extinguishers and we do not". *This minimum F-Kit is subject to change as the Shelter sector gathers new information and updates its strategies.* The key issue: Shelter partners must distribute the same fire safety materials. See also: 9.0 Fire extinguisher management

For the following items, trainers must explain how to use them in their fire safety training

ITEM	PROS	CONS
Fire blanket	- Less likely to be sold: inexpensive and has only one purpose - A reminder for fire safety in the kitchen - Easy/quick fire suppression method - Small; easy to transport - Many refugees cook inside their tents, even when knowing the fire risk	Expensive; proved not to be easy/effective to use in collective sites (source: DRC)
Wiring insulation /tape	- Inexpensive, small; easy to transport - Less likely to be sold: inexpensive and has only one purpose - Quick way to decrease fire risk - Majority of fires are due to poor wiring	Might be used for alternative reasons
Timber	Raise electric wire off the ground Put up a fence around settlements that are close to fields [that may burn in hot weather] Might be a good way to use excess timber from previous shelter projects	Might be used for alternative reasons Expensive to transport
Shovels	Sends the message that simple sand/dirt is sufficient for fire suppression	- Might be used for alternative reasons - Potentially expensive
Gloves	- Reminder about fire safety - Inexpensive, small; easy to transport	
Insulation for exhaust pipes	- Less likely to be sold: inexpensive and has only one purpose - Many fires start from the contact of vinyl and exhaust pipes	
First Aid Kit	- Emphasizes importance of fire safety for one's health - Passes fire safety ownership to refugee (i.e. aids in behaviour change)	- Requires much more training - Might be sold - Expensive - Dangerous if used improperly

4.0 Modality

This section addresses the number of fire extinguishers each settlement should receive, if fire extinguishers are used as part of an NGO's fire safety intervention.

TOPIC	MINIMUM STANDARD	FOR CONSIDERATION
Messaging	Inform the trainees – especially the focal point/committee – of the following issues: • Some refugees do not feel comfortable getting the fire extinguisher from other tents, especially at night. • Some holders of fire extinguishers worry about sharing the fire extinguisher, assuming they will not get it back	Inform the shawish that for new tents, it is ideal for evenly spread tents to reduce fire risk.
Amount and Locations for fire extinguisher	1. Prioritize the tents to receive fire extinguishers: - elderly/disabled refugees - "land-locked" tents (i.e. tents with no easy exits) - Tents located beside/near planted field - Previous fire victims - HHs that previously had a FE (to be able to swap for a new one without conflict) 2. After prioritizing locations from #1, a fire extinguisher should be placed within 10 meters of any tent's entrance	Consider other people who will most likely be in the home. For dense settlements: consider locations in chain of tents where refugees are "closed into" a series of attached tents For sparse settlements: You may consider central lockboxes to hold fire extinguisher outdoors where all tents can access it (SCI has example of this engineering)
Visibility around settlement (see section 6.0)	Tent stickers/spray paint should be recognizable with bright color and prominent image of fire extinguisher. (See the layout in Annex part B.1.) Hotline/Emergency numbers (See the layout in Annex part B.2.)	
Management/ Oversight of Modality (see section 9.0)	FEs should be delivered at community/ committee level and existing committees charged for their storage, maintenance and communicating modalities to entire settlement	

5.0 Fire Safety Training

This section sets a guideline for the key messages that must be communicated during fire safety training, as well as the materials used for complement that messaging. Ideally, everyone in settlement should undergo training.

TOPIC	MINIMUM STANDARD	FOR CONSIDERATION
Who to train	The people holding fire extinguishers in their tents, Community response teams, residents in SSB's All NGO staff working in Shelter, Protection and WASH Focal point/ community group responsible for fire extinguishers	ALL people, especially women and children
Fire risks / prevention (see section A. of the ANNEX, Fire risk management)	**Informal Settlements** 1. Understanding the benefits of a participatory approach and how this can be facilitated. 2. Discuss findings with your colleague that conducted assessment in section 2.0 to be aware of major issues 3. Walk through settlement with trainees to do safety assessment: Identify improvements that must be done to ensure fire safety 4. Minimum issues to address: - Wires high (out of reach/ puddles) - Piles of flammable materials against tents - Protect exposed wires - Internal electrical wiring close to fabrics or wall coverings - Use of candles - Burning waste - Cooking practices – moving away to safe areas, using a guard to stop young children receiving burns or scalds **Substandard Buildings** Carry out home safety check and address – - Maintaining means of escape - Use of smoke alarm - Closing doors in a fire - How to escape from a fire - Protection in a room away from a fire - use of candles - preventing cooking fires	Create action plan with them to mitigate fire risks Some risks cannot be avoided for certain people and situations, but communicate them anyway. Help think of alternative risk mitigation tactics. Advise them to put up a fence around settlements that are close to fields [that may burn in hot weather]

Injury prevention / Burns treatment	Basic treatment for burns and what to do and who to a call for more treatment. Stop, Drop and Roll explanation and demonstration (see below)	
Child Education and Awareness	Using Francis the Firefly Removing all lighters to a safe place out of reach	
Fire suppression	**Informal Settlements and Sub standard buildings** 1. Explain how and when to suppress a fire with wet blankets, sand, and fire extinguishers (train how to use items in your F-Kit from section 3.0) 2. Fire extinguisher: how to use, how to check for pressure and expiration dates (see section 9.0 for use and service of FE); explain modality (see "Messaging" of section 4.0) 3. Trainees must practice these during the training	Set up FE in/around the tents with the refugees and discuss its accessibility with neighbours at different times of day Run a fire "drill" to practice reacting to different types of fires
Materials (layouts of visibility materials are in ANNEX section B.)	To use during training: Fire extinguisher and materials to make a small fire; wet blanket Stickers to indicate where FEs are located (see section 6.0) Certificate of FE ownership (see section 7.0)	Distribute a smaller, less costly fire-suppressing item to those who are not receiving a FE, to entice them to attend the training, too (experience has proven that only the FE recipients attend the training)
Train the community groups responsible for fire extinguishers and safety (see section 7.0 and 9.0)	4. Start with section 2.0 – Target Audience – to know who to train 5. Fully communicate an understanding of: - Modality/locations (see section 4.0) - Major issues/problems related to fire safety in settlements (see Introduction for list) - Purposes of Hotline: to be used for any issues (e.g. worried about neighbour not sharing), not just FE 3. Train them how to be first responders: help suppress the fire as possible; call the Red Cross/Civil Defense and your shelter partner hotline (put up stickers – see Annex section B) 4. Give them something to confirm their role (see ANNEX section B4 for examples of cards/certificates)	Task them to create an action plan with roles and responsibilities for refugees to mitigate the risks that surround their living space. Train them how to run a fire drill regularly with people in their settlement. Train them to conduct fire safety sessions for the people who have not undergone training.

6.0 Materials/Visibility

Materials to distribute in the settlement after training, with an explanation of the purpose they intend to serve and what messages must be included in them.

Layouts for visibility are located in Annex part B.

ITEM	MINIMUM STANDARD	FOR CONSIDERATION
Handouts (See ANNEX section B for examples of visibility materials and templates)	Notification where FE is located using stickers, spray paint, or flag Hotline numbers posted around settlement	Post messages/ instructions for how to handle a fire and/or use a fire extinguisher Branded items with fire safety message (e.g. hats, footballs, small stickers): to maintain awareness and slow behaviour change
Certification/ ID cards	Must use for passing the ownership to the settlement/leaders – see section 8.0 Minimum to include: Responsibilities, date of issue, signatures, the NGO that trained them	Can include contact phone number list for different types of issues, problems, emergencies

7.0 Refugee ownership tactics

The primary cause of fires is the lack of ownership and responsibility a person takes over his/her own fire safety. This section outlines how trainers can leave behind a sense of ownership within each community to take fire safety seriously at home.

TOPIC	MINIMUM STANDARD	FOR CONSIDERATION
Start by contacting focal point/ community group (See section 2.0 for choosing and preparing this group/ person)	Contact CSMC to find all existing structures.	If no existing structure exists, follow CSMC procedures to establish a person/group.
Responsibilities of focal point/ community group (Must be included as part of training – see section 5.0)	A person or committee within each settlement will monitor everyone's application of fire risk mitigation, including: - Monitor proper placement and location of fire extinguisher - Fire extinguisher monitoring (see section 9.0 for more information about this) Notify NGO if there is a fire; follow up with instructions from section 11.0 Post-Fire Follow-Up	- Run regular fire drills with refugees - Stay in touch with Shelter NGO with regular follow-ups about fire safety awareness and other issues (e.g. stickers removed) - Keep refugees accountable for use of fire risk mitigation techniques - Train new arrivals or those who have not heard fire safety messaging; or contact Shelter NGO to ask for an official training to take place again - Should be available in the settlement to help immediately (or delegate responsibilities when unavailable)
Materials to give him/ her/them (see section 6.0 for explanations; see ANNEX section B for layout examples)	Important phone numbers related to fire safety Card/Certificate including: - Responsibilities - Signatures - Issue date - NGO who trained them	- Phone credit

8.0 Post-Distribution Monitoring (PDM) questions

To assess the impact of fire safety interventions, PDMs must be used. Refer to initial questions from section 2.0.

TYPE OF QUESTION	MINIMUM STANDARD	FOR CONSIDERATION
Fire safety preparation	• Have you received fire safety training before? • What do you remember about it? • Is there a fire safety committee or focal point in your settlement? • What attributes are important for a fire safety focal point to have to help the community? Why? • If you have received fire safety training before • -What materials did you receive? • -Where is the nearest fire extinguisher to your tent?	
Fire response	• If I fire started right now, how would you handle it?	

9.0 Fire extinguisher management

If fire extinguishers are established as a key component of fire safety interventions, attention must be paid to the ongoing maintenance and complications associated with it. Issues to keep in mind are: servicing and expiry dates, broken parts, scarcity of suppliers, poor quality, proper use and functionality, expense, and use of FE for income.

This section helps outline how a FE is managed after its distribution to a settlement and what key messages are needed for training someone on its use.

TOPIC	MINIMUM STANDARD	FOR CONSIDERATION
Who takes care of it? (see section 7.0)	CSMC / Existing community group structure / Focal point Use section 7.0 to create this focal point For training them: see section 5.0 fire safety training, and include lessons in this section 9.0	If an NGO lacks ability to hand over responsibilities to the settlement, NGO must note the FEs' expiry dates; when expired/serviced, NGO must swap out old with new ones in order to decrease chances of conflict

Labelling/ Documentation	Apply label with identifying marking (date of last renewal, # coding, logos) to help settlement oversee its stock of FEs (see example in ANNEX section B.)	NGOs may want to label FEs to document where/when FEs were distributed in case settlements ask for new ones in future
Maintenance/ Care Procedures	Fire extinguishers must be serviced at least once per year to maintain its functionality Additional maintenance is required when: - Pressure gauge falls outside of the green range - Parts break or get lost - The fire extinguisher is used	NGO may want to help settlement to find nearest supplier(s) with contact information

10.0 NGO long-term role

This section explains how fire safety partners oversee fire safety interventions in the long term: paying attention to the changing trends, contexts and living situations for the vulnerable in Lebanon, as well as using the document for advocacy and coordination.

TASK	MINIMUM STANDARD
Coordination with other partners	Must be disseminated to all new and existing Shelter sector partners by the Shelter WG lead. For partners who are new to fire safety interventions, this document should be shared alongside a training with any shelter partner who can invite them to join a fire safety intervention. The shelter WG lead should ensure this happens. All partners should update a shared 3W (What/Where/When) Matrix of fire safety interventions.
Editing the minimum standards	**REMINDER:** ***This document of minimum guidelines is subject to change as the Shelter sector gathers new information and updates its strategies***Shelter WG lead is responsible to lead meetings for gathering edits that should be made, and then officially editing document. Shelter WG lead should gather and share information with fire safety consultants – when applicable -- to aid in the Minimum Guidelines' improvement.
Follow up with settlements	Ongoing: check with fire safety focal point/ community group to answer questions and advise on issues in settlement related to fire safety Within two months of training: conduct monitoring and evaluation (see section 8.0)
Endorsement	How to share this document with donors

11.0 Post-Fire Follow-up

In the event of a fire partners have a responsibility to intervene by replacing used fire extinguishers and learning what can be done to prevent more fire damage in the future.

TASK	MINIMUM STANDARD	CONSIDERATIONS
Desk Research	Who is the fire focal point in the settlement? Contact him/her to set up a visit.	When was the last time your NGO intervened with fire safety training and distributions? Where are the FEs supposed to be located?
First visit: Questions	- When/where/how the fire happened? What allowed the fire to spread? (ask neighbors, too) - Are all FEs still efficient? Check all FEs (pressure, hose, holes, expiry date, stickers) a. Do all refugees know how to use them? b. Do they know where the FEs are located? - Retrain refugees: use the fire as an example for all parts of training, and redistribute FEs as needed (swap old for new; record numbers of collected and distributed FEs) - Follow up with FP about his/her role and what support he/she needs; how confident does he/she feel as FP? Should it be a committee?	Take photos Additional Questions to consider for improving future interventions: - What was the result of the fire (e.g. injury, shelter damage, NFI needs)? - How did the victim and neighbors respond? (How did they help? Flee? Call someone? Suppression tactics?) - Do they know how to prevent fires? - Have refugees taken steps to prevent fires since the training? - What about the past training (if applicable) helped? What could have been better in the training?
Post-Visit	Report to other fire partners the lessons learned	Update training documents accordingly

ANNEX

A. Fire risk management

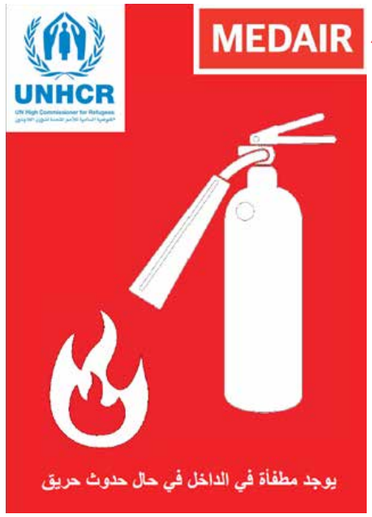
These fire risks should be communicated in all interventions, when relevant, in addition to the messages during fire safety training. These are not minimum standards, but rather, a guide for all people (in the NGO and settlement) to use in their attempts at risk mitigation.

Tent layout and spacing	• Emergency exits for labyrinth-type tent designs Having an escape plan and making sure that the whole family knows the plan. • Forming a safety zone around your tent (Removing dead branches from trees) • Include exit plans • Fence to separate settlement from open field (especially in summer)
Suppression materials (natural materials, NFIs)	• [Fire extinguisher near exit for neighbour to use]: use 2-3 meters away from fire; aim spray at base of fire, unless it is an oil fire in which you aim at top of fire • Locate nearest FE • Sand, dirt • Water (NOT for oil fires!)
Electrical hazards	• Do not overload your electrical circuits. • Protect the wires from moisture/ humans/ sun • Raise wires from the ground (and out of children's reach)
Cooking / Heaters	• When you are cooking, do not leave the pot on the stove unless you are watching it • Protect the exhaust pipes from the vinyl of the tent
Hotlines	• Stickers: see section 6.0 and ANNEX B2 • Who to call and when
Flammable items within tent	• Do not smoke in the tent. • Use candle holder • Switch off all electrical appliances at the wall at night or when leaving your home

B. Visibility materials

B1. Stickers for fire extinguishers

Use bright, recognizable color, preferably one that matches your hotline sticker (#2 below)



Top left and right corners for the distributing NGO's and donor's logos

B2. Hotline / Emergency numbers

Use bright, recognizable color, preferably one that matches your fire extinguisher tent sticker (#1 below)

Bottom left corner for the distributing NGO's and donor's logo

B3. Fire extinguisher labels

Example of format for stickers. Should include service date so the FE holder knows the annual deadline for FE servicing

MEDAIR 2015-10-0001	MEDAIR 2015-10-0002	MEDAIR 2015-10-0003	MEDAIR 2015-10-0004	MEDAIR 2015-10-0005	MEDAIR 2015-10-0006	MEDAIR 2015-10-0007
MEDAIR 2015-10-0008	MEDAIR 2015-10-0009	MEDAIR 2015-10-0010	MEDAIR 2015-10-0011	MEDAIR 2015-10-0012	MEDAIR 2015-10-0013	MEDAIR 2015-10-0014
MEDAIR	MEDAIR	MEDAIR	MEDAIR	MEDAIR	MEDAIR	MEDAIR

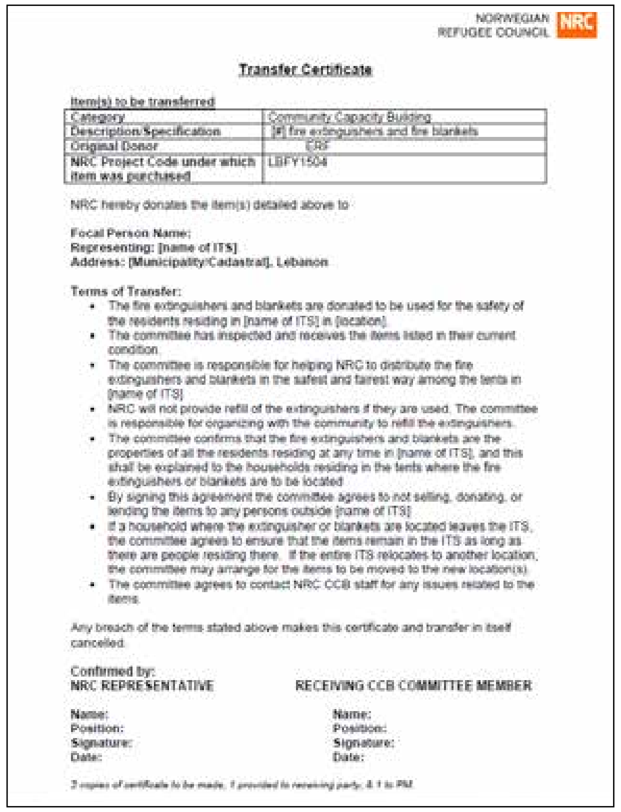
B4. Documentation for responsible focal point / committee

Minimum to includes: Responsibilities, date of issues, signatures, the NGO that trained them.

Example of certificates:

NORWEGIAN REFUGEE COUNCIL NRC

ERF	المشروع الأصلي
LBFY1504	رمز مشروع المجلس النرويجي للاجئين الذي تم بموجبه شراء المادة



NORWEGIAN REFUGEE COUNCIL NRC

Transfer Certificate

Item(s) to be transferred

Category	Community Capacity Building
Description/Specification	[#] fire extinguishers and fire blankets
Original Donor	ERF
NRC Project Code under which item was purchased	LBFY1504

NRC hereby donates the item(s) detailed above to

Focal Person Name:
Representing: [name of ITS]
Address: [Municipality/Cadastral], Lebanon

Terms of Transfer:

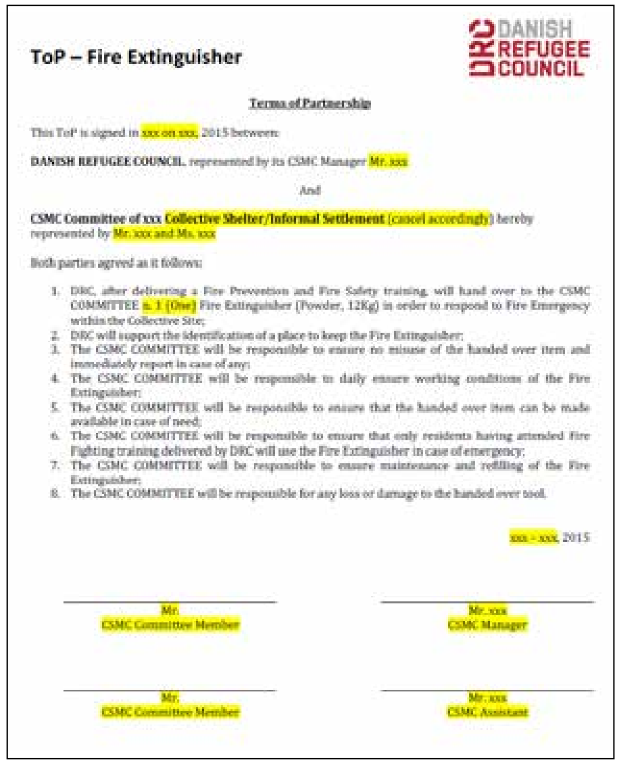
- The fire extinguishers and blankets are donated to be used for the safety of the residents residing in [name of ITS] in [location].
- The committee has inspected and receives the items listed in their current condition.
- The committee is responsible for helping NRC to distribute the fire extinguishers and blankets in the safest and fairest way among the tents in [name of ITS]
- NRC will not provide refill of the extinguishers if they are used. The committee is responsible for organizing with the community to refill the extinguishers.
- The committee confirms that the fire extinguishers and blankets are the properties of all the residents residing at any time in [name of ITS], and this shall be explained to the households residing in the tents where the fire extinguishers or blankets are to be located
- By signing this agreement the committee agrees to not selling, donating, or lending the items to any persons outside [name of ITS]
- If a household where the extinguisher or blankets are located leaves the ITS, the committee agrees to ensure that the items remain in the ITS as long as there are people residing there. If the entire ITS relocates to another location, the committee may arrange for the items to be moved to the new location(s).
- The committee agrees to contact NRC CCB staff for any issues related to the items.

Any breach of the terms stated above makes this certificate and transfer in itself cancelled.

Confirmed by:
NRC REPRESENTATIVE — RECEIVING CCB COMMITTEE MEMBER

Name: / Name:
Position: / Position:
Signature: / Signature:
Date: / Date:

2 copies of certificate to be made, 1 provided to receiving party, & 1 to PM.



ToP – Fire Extinguisher — DANISH REFUGEE COUNCIL

Terms of Partnership

This ToP is signed in xxx on xxx, 2015 between:

DANISH REFUGEE COUNCIL, represented by its CSMC Manager Mr. xxx

And

CSMC Committee of xxx Collective Shelter/Informal Settlement (cancel accordingly) hereby represented by Mr. xxx and Ms. xxx

Both parties agreed as it follows:

1. DRC, after delivering a Fire Prevention and Fire Safety training, will hand over to the CSMC COMMITTEE n. 1 (One) Fire Extinguisher (Powder, 12Kg) in order to respond to Fire Emergency within the Collective Site;
2. DRC will support the identification of a place to keep the Fire Extinguisher;
3. The CSMC COMMITTEE will be responsible to ensure no misuse of the handed over item and immediately report in case of any;
4. The CSMC COMMITTEE will be responsible to daily ensure working conditions of the Fire Extinguisher;
5. The CSMC COMMITTEE will be responsible to ensure that the handed over item can be made available in case of need;
6. The CSMC COMMITTEE will be responsible to ensure that only residents having attended Fire Fighting training delivered by DRC will use the Fire Extinguisher in case of emergency;
7. The CSMC COMMITTEE will be responsible to ensure maintenance and refilling of the Fire Extinguisher;
8. The CSMC COMMITTEE will be responsible for any loss or damage to the handed over tool.

xxx - xxx, 2015

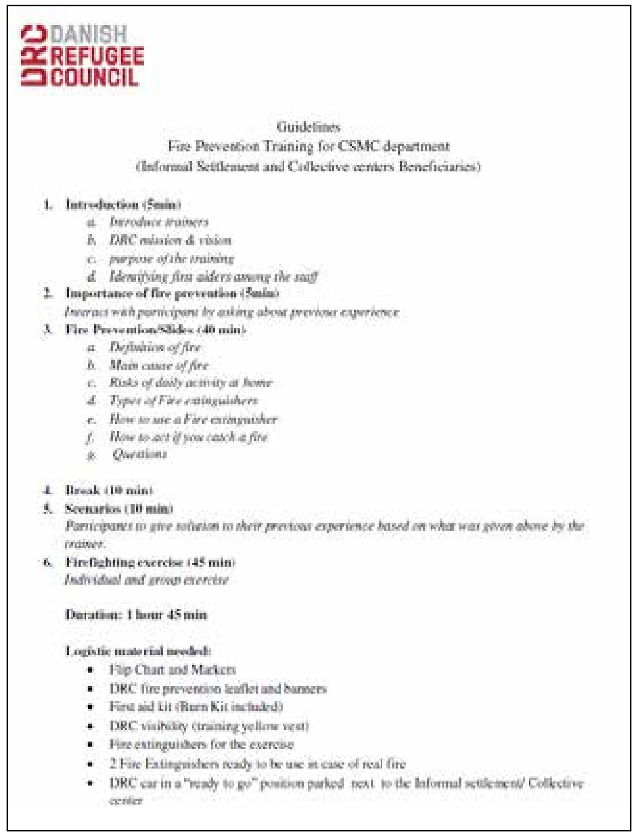
Mr. — CSMC Committee Member | Mr. xxx — CSMC Manager

Mr. — CSMC Committee Member | Mr. xxx — CSMC Assistant

Example of ID cards (front/back):

C. Training Tools

Example of trainers to use



DANISH REFUGEE COUNCIL

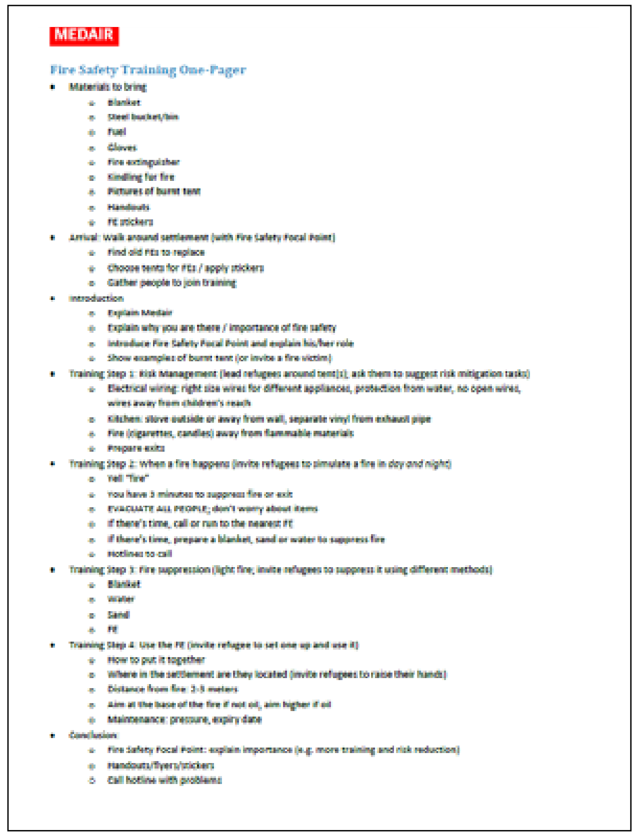
Guidelines
Fire Prevention Training for CSMC department
(Informal Settlement and Collective centers Beneficiaries)

1. **Introduction (5min)**
   a. *Introduce trainers*
   b. *DRC mission & vision*
   c. *purpose of the training*
   d. *Identifying first aiders among the staff*
2. **Importance of fire prevention (5min)**
   Interact with participant by asking about previous experience
3. **Fire Prevention/Slides (40 min)**
   a. *Definition of fire*
   b. *Main cause of fire*
   c. *Risks of daily activity at home*
   d. *Types of Fire extinguishers*
   e. *How to use a Fire extinguisher*
   f. *How to act if you catch a fire*
   g. *Questions*
4. **Break (10 min)**
5. **Scenarios (10 min)**
   Participants to give solution to their previous experience based on what was given above by the trainer.
6. **Firefighting exercise (45 min)**
   Individual and group exercise

Duration: 1 hour 45 min

Logistic material needed:

- Flip Chart and Markers
- DRC fire prevention leaflet and banners
- First aid kit (Burn Kit included)
- DRC visibility (training yellow vest)
- Fire extinguishers for the exercise
- 2 Fire Extinguishers ready to be use in case of real fire
- DRC car in a "ready to go" position parked next to the Informal settlement/ Collective center



MEDAIR

Fire Safety Training One-Pager

- Materials to bring
  - Blanket
  - Steel bucket/bin
  - Fuel
  - Gloves
  - Fire extinguisher
  - Kindling for fire
  - Pictures of burnt tent
  - Handouts
  - FE stickers
- Arrival: Walk around settlement (with Fire Safety Focal Point)
  - Find old FEs to replace
  - Choose tents for FEs / apply stickers
  - Gather people to join training
- Introduction
  - Explain Medair
  - Explain why you are there / importance of fire safety
  - Introduce Fire Safety Focal Point and explain his/her role
  - Show examples of burnt tent (or invite a fire victim)
- Training Step 1: Risk Management (lead refugees around tent(s), ask them to suggest risk mitigation tasks)
  - Electrical wiring: right size wires for different appliances, protection from water, no open wires, wires away from children's reach
  - Kitchen: stove outside or away from wall, separate vinyl from exhaust pipe
  - Fire (cigarettes, candles) away from flammable materials
  - Prepare exits
- Training Step 2: When a fire happens (invite refugees to simulate a fire in *day and night*)
  - Yell "Fire"
  - You have 3 minutes to suppress fire or exit
  - EVACUATE ALL PEOPLE; don't worry about items
  - If there's time, call or run to the nearest FE
  - If there's time, prepare a blanket, sand or water to suppress fire
  - Hotlines to call
- Training Step 3: Fire suppression (light fire; invite refugees to suppress it using different methods)
  - Blanket
  - Water
  - Sand
  - FE
- Training Step 4: Use the FE (invite refugee to set one up and use it)
  - How to put it together
  - Where in the settlement are they located (invite refugees to raise their hands)
  - Distance from fire: 2-3 meters
  - Aim at the base of the fire if not oil, aim higher if oil
  - Maintenance: pressure, expiry date
- Conclusion
  - Fire Safety Focal Point: explain importance (e.g. more training and risk reduction)
  - Handouts/flyers/stickers
  - Call hotline with problems

Appendix 10: Breathing apparatus and hot fire training programme

Project Timeline

To deliver all proposed objectives would require a minimum of 18 month's timeframe within project scope.

Timeframe in which phased plan objectives could be delivered	Deliverables
0 – 3 months	Arranging collection and organising donated equipment and PPE
0 – 3 months	Delivery of national workshop
3 – 5 months	Shipping of donated equipment and release from customs
3 – 5 months	Construction of hot fire container training rigs
6 – 7 months	Breathing Apparatus Instructor training course based at the UNIFIL training centre and in Beirut Central Fire Station
7 – 10 months	Regional instructors delivering training and consolidating learning
10 – 12 months	Tactical Ventilation training
12 – 15 months	Regional instructors delivering training and consolidating learning
15 – 18 months	Compartment Fire Behaviour Instructor Training

Appendix 11: Proposed budgets for Operation Florian Project

1. **Proposed Phased Plan and Budget for National workshop for standardisation of community education training programme**

Objective: *Operation Florian Community Education Specialists would facilitate workshop for key national stakeholders to produce agreed upon national standards for the delivery of community education and fire risk reduction programmes for Civil Defense and NGO's. This would involve observation of a pilot delivery of one day training programme to advise and recommend on improvements to training programme prior to being finalised as agreed national standard.*

Programme

Day	Objectives
1	Team arrives
2	Workshop setup
3	National workshop
4	Preparation for Community workshop training
5	Delivery of community workshop training to NGO staff
6	Evaluation of training with stakeholders
7	Team returns to UK

Proposed Budget

Item	Cost per unit	Total Cost
Flights	$900	$2700
Insurance	$500	$500
Specialist Advisor Daily Rate	$100	$2100
Daily Allowance	$50	$1050
Accommodation	$100	$2100
Admin		$945
	Total	**$10385**

- Costs are based on a team consisting of 3 community education and firefighting specialist in country for 7 days. These figures are a estimation of potential costs and on the basis of administration and security costs covered by identified national stakeholder.

2. **Proposed budget for donation of Personal Protective Equipment and Breathing Apparatus Sets**

Objective: *Donation of PPE and BA sets shipped to Lebanon in 20ft Shipping Container*

Item	Cost per unit	Total Cost
Shipping	$7000	$7000
UK travel and fuel	$500	$500
Admin		$750
	Total	**$8250**

3. **Proposed budget for donation of UK firefighting vehicle**

Objective: *Donation of UK firefighting vehicle which has a high pressure pump*

Item	Cost per unit	Total Cost
Shipping	$7000	$7000
UK travel and fuel	$500	$500
Admin		$750
	Total	**$8250**

4. **Proposed budget for specialist team to advise on construction and fire testing of hot fire training containers**

Objective: *To assist the Civil Defense with the construction of hot fire training containers and to fire test training rigs and develop safe systems of work procedures.*

Programme

Day	Objectives
1	Team arrives
2	Inspect and oversee construction of container conversion
3	Inspect and oversee construction of container conversion
4	Inspect and oversee construction of container conversion
5	Rest Day
6	Field visit to IS and SSB in Bekaa Valley or Mount Lebanon
7	Fire testing of container
8	Fire Testing of container
9	Evaluation
10	Team leaves

Proposed Budget

Item	Cost per unit	Total Cost
Flights	$900	$1500
Insurance	$500	$1500
Specialist Advisor Daily Rate	$100	$3000
Daily Allowance	$50	$1500
Accommodation	$100	$3000
Admin		$1050
	Total	**$11550**

- Costs are based on a team of 3 Compartment Fire Behaviour specialists for 10 days.
- Donation of 3 x 20ft shipping containers would need to be facilitated by UNHCR and Civil Defense would be responsible for costs attributed to conversion costs of container, specialist welding and engineering and fuel for testing fire dynamics of container.

5. **Proposed budget for delivery Breathing Apparatus Instructor training programme**

Objectives: *To deliver a specialist Breathing Apparatus Instructors programme to 10 regional Civil Defense Instructors. This would enable regional instructors to have specialist knowledge and skills in fire development, urban firefighting techniques and train all firefighters in breathing apparatus procedures.*

Programme

Day	Objectives
1	Team arrives
2	Course intro
3	Attendance UNIFIL training multi-rig – Practical / Theoretical Input
4	Attendance UNIFIL training multi-rig – Practical / Theoretical Input
5	Attendance UNIFIL training multi-rig – Practical / Theoretical Input
6	Attendance UNIFIL training multi-rig – Practical / Theoretical Input
7	Rest day
8	Rest day
9	Hot fire training in Beirut
10	Hot fire training in Beirut
11	Theoretical input
12	Student Preparation
13	Practical Assessment / Written exam
14	Team returns

Proposed Budget

Item	Cost per unit	Total Cost
Flights	$900	$1500
Insurance	$500	$1500
Specialist Advisor Daily Rate	$100	$4200
Daily Allowance	$50	$1500
Accommodation	$100	$4200
Admin		$1290
	Total	**$14190**

6. Proposed budget for Tactical Ventilation using Positive Pressure Fans

Objectives: *To deliver training programme which provides specialist knowledge and awareness for the use of tactical ventilation techniques in urban fires using positive pressure ventilation fans.This would be delivered to regional training Breathing Apparatus Instructors.*

Programme

Day	Objectives
1	Team arrives
2	Team preparations at UNIFIL training multi-rig
3	Practical tactical ventilation training
4	Practical tactical ventilation training
5	Practical tactical ventilation training
6	Evaluation of training with stakeholders
7	Team returns to UK

Proposed Budget

Item	Cost per unit	Total Cost
Flights	$900	$2700
Insurance	$500	$500
Specialist Advisor Daily Rate	$100	$2100
Daily Allowance	$50	$1050
Accommodation	$100	$2100
Admin		$945
	Total	**$10385**

Costs are based on a team consisting of 3 community education and firefighting specialist in country for 7 days.

7. Proposed Budget for Compartment Fire Behaviour Instructor training course

Objectives: *To deliver compartment fire behaviour instructor training for all regional instructors and train instructors in the safe operational use of the fire behaviour units.*

Programme

Day	Objectives
1	Team arrives
2	Inspect and test fire dynamics of container
3	Deliver CFBTI training course in Beirut
4	Deliver CFBTI training course in Beirut
5	Deliver CFBTI training course in Beirut
6	Deliver CFBTI training course in Beirut
7	Rest day
8	Rest day
9	Practical assessment
10	Team leaves

Proposed Budget

Item	Cost per unit	Total Cost
Flights	$900	$1500
Insurance	$500	$1500
Specialist Advisor Daily Rate	$100	$3000
Daily Allowance	$50	$1500
Accommodation	$100	$3000
Admin		$1050
	Total	**$11550**

- Costs are based on a team of 3 Compartment Fire Behaviour specialists for 10 days.
- Donation of 3 x 20ft shipping containers would need to be facilitated by UNHCR and Civil Defense would be responsible for costs attributed to conversion costs of container, specialist welding and engineering and fuel for testing fire dynamics of container.

Total Budget Costs for firefighter development training

Phased project objective	Cost
CFBT Container training units advisors	$11550
Breathing Apparatus Instructor Course	$14190
Tactical ventilation training	$10385
Compartment fire behaviour training instructor	$11550
TOTAL	**$47675**

12. Contributors

Operation Florian:

- **George Bryant -** George has been a fire fighter and Fire Officer for over 18 years. He has also been an instructor, a Community Resilience Officer and a Government Adviser on flood management.

- **Steve Jordan -** Director of Operation Florian. Steve is a professional fire fighter. He has served in Greater Manchester for 17 years and is qualified as an instructor in a range of technical skills such as breathing apparatus and road traffic collision rescue. Steve sits on the board for FIRE AID.

- **Laura Hirst -** Laura is a PhD researcher working in collaboration with Operation Florian and the Global Development Institute, University of Manchester.

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