Beirut explosion impact assessment

September 8th, 2020
Introductory note

Strategy&’s impact assessment status update #1 published on August 19th, 2020 used publicly available information from international and national organizations and interviews with sector experts. Since then, the Strategy& team has developed a detailed impact assessment tool based on:

1. **Geo-spatial data analysis** that incorporated blast radius and damage data from around 60 city districts.
2. **Expert interviews from the various sectors** to validate the assumptions and the cost estimates.
3. **Google maps data**.
4. **Other data sources and analysis**, such as income level distribution by district, level of damage, revenues per sector and company size.

The final report includes the methodology for deriving the assessment for each sector, and the accordingly updated results. The assessment excludes the cost of indirect impacts (e.g., multiplier effect, supply chain disruptions, exports) and public infrastructure damage (e.g., port infrastructure, electrical grid, and water supply).
Strategy&’s impact assessment – objectives

- Quantify the infrastructure, social and economic effects of the Beirut explosion by district\(^1\) within a 4.1km radius of the explosion

- Provide a consolidated view of the impact of the explosion on housing, food, healthcare, education, businesses and culture by district\(^1\)

- Identify the funding requirements versus the pledges made by sector (housing, food, healthcare, education, businesses and culture) highlighting funding gaps

- Raise awareness on the sources of donations pledged per sector to reduce duplication in the mobilization of resources

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1) Where data is available
Source: Strategy& analysis
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Key findings
Summary of the infrastructure impact
(excludes public infrastructure damages)

HOUSING
- 10,610 buildings with minimal damage (122,890 households)
- 2,570 buildings with moderate damage (28,980 households)
- 240 buildings with severe damage (2,310 households)
-US$ ~1,830 Million financial requirements

HEALTHCARE
- 17 damaged hospitals of which 4 severely damaged
- 16 damaged primary healthcare centers
-US$ ~75 Million financial requirements

EDUCATION
- 120 damaged schools
- 20 damaged TVETs
- 8 damaged universities
-US$ ~60 Million financial requirements

BUSINESSES
- 26,560 businesses with low level of damage
- 3,870 businesses with medium level of damage
- 505 businesses with high level of damage
-US$ ~865 Million financial requirements

CULTURE
- 8 historical areas
- 480 heritage buildings
- 160 additional buildings with special features
-US$ ~285 Million financial requirements

Total: US$ ~3.115 Billion

1) Funding required could be less as some affected households can potentially afford to pay for the reconstruction damage independently
2) Upper end of funding; funding has been estimated for the 7 most affected hospitals and 16 primary healthcare centers (PHCs)
3) Technical and Vocational Education and Training
Note: Public infrastructure (e.g., port, grain silos, electricity grids, roads, telecom towers) damages were not covered in the analysis.
Summary of the social impact
(within a 4.1 Km radius of the explosion)

1) Excludes jobs in the education (nurseries, schools, TVETs and universities) and health (hospitals and medical centers) sectors
2) Jobs affected include temporary and permanent loss. The analysis excludes supply chain and multiplier impact
Source: Strategy& analysis

**TEMPORARY HOUSING**
~31,000 uninhabitable houses and ~13,000 households in need of shelter
Funding requirement of
US$ ~30 Million for up to 18 months

**FOOD ASSISTANCE**
~172,000 individuals in urgent need and
~135,000 in moderate need of food assistance
Funding requirement of
US$ ~215 Million for 12 months

**TREATMENT OF PATIENTS**
~6,500 patients treated for physical injuries
~145,000 patients need mental health support
Funding requirement of
US ~80 Million

**SCHOOLING**
~67,000 students impacted due to schools and TVETs damages

**JOBS AND LIVELIHOOD**
~130,000 jobs directly affected
US$ ~230 Million of estimated loss of salaries

**TOTAL**
US$ ~555 Million
Summary of the economic impact
(excludes indirect economic impacts)

REVENUES\(^1\) LOST BY SECTOR – within one from the explosion
(in US$ Million, data from within a 4.1 km radius of the explosion)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Lost Revenues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shopping</td>
<td>38%</td>
</tr>
<tr>
<td>Education</td>
<td>17%</td>
</tr>
<tr>
<td>Food and Drink</td>
<td>16%</td>
</tr>
<tr>
<td>Services</td>
<td>11%</td>
</tr>
<tr>
<td>Healthcare</td>
<td>9%</td>
</tr>
<tr>
<td>Non-Consumer(^2)</td>
<td>6%</td>
</tr>
<tr>
<td>Leisure</td>
<td>11%</td>
</tr>
<tr>
<td>Lodging</td>
<td>17%</td>
</tr>
<tr>
<td>Others(^3)</td>
<td>11%</td>
</tr>
</tbody>
</table>

TOTAL OF US$ ~920 Million

\(^1\) Revenues directly affected excluding imports / exports and multipliers impact and impact on tourism
\(^2\) Banks, corporate offices and embassies
\(^3\) Uncategorized small businesses such as computer shops, beauty salons, art studios

Source: Strategy\& analysis
Estimated financial requirements vs. announced pledges

TOTAL FINANCIAL REQUIREMENTS
(US$ Million, Infrastructure and Social Costs)

- Housing
- Culture
- Food security
- Businesses
- Healthcare
- Education

1.860 (51%)

Includes reconstruction costs of damaged households and provision costs for temporary housing

1,095 (30%)

Includes repair costs of damaged business across 7 sectors as well as salaries at risks covering a period of one year

285 (8%)

Includes repair costs of damaged historical buildings

155 (4%)

Includes repair costs for damaged schools and universities

215 (6%)

Includes repair costs for damaged healthcare facilities and provision of services for physical and mental health care

3,670

TOTAL ANNOUNCED PLEDGES BY FUNDING SOURCE
(US$ Million)

- Others
- Crowdfunding Campaigns - Public
- Foreign Aid - Countries
- Foreign Aid - International Summit
- Corporates
- International Organizations
- Bilateral Foreign Aid

60 (2%)

Includes food assistance for people in need

620

Funding Gap of US$ ~3 billion

Note: Micro-businesses with unregistered locations were not accounted for in the assessment due to limited availability of data

Source: Impact Lebanon, Strategy& analysis

1) Includes estimations for undisclosed funding

Directional
### Estimated financial requirements vs. announced pledges by type of need (US$ Million)

<table>
<thead>
<tr>
<th>Type</th>
<th>Requirement (US$ Million)</th>
<th>Pledges (US$ Million)</th>
<th>Unmet %</th>
<th>Met %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare</td>
<td>1,550</td>
<td>1,095</td>
<td>~60%</td>
<td>40%</td>
</tr>
<tr>
<td>Food Security</td>
<td>1,860</td>
<td>1,095</td>
<td>~30%</td>
<td>70%</td>
</tr>
<tr>
<td>Housing</td>
<td>285</td>
<td>215</td>
<td>~5%</td>
<td>95%</td>
</tr>
<tr>
<td>Education</td>
<td>60</td>
<td>60</td>
<td>~5%</td>
<td>95%</td>
</tr>
<tr>
<td>Culture</td>
<td>1,095</td>
<td>60</td>
<td>~5%</td>
<td>95%</td>
</tr>
<tr>
<td>Businesses</td>
<td>285</td>
<td>60</td>
<td>~5%</td>
<td>95%</td>
</tr>
</tbody>
</table>

*Note: Figures below exclude US$ ~325 million in summit commitments which have not been allocated to the sectors yet.*

*Source: Impact Lebanon, Strategy& analysis*

*Note: A dynamic tool will be available on our website to track pledges vs. funding required. The tool will allow stakeholders to direct funding to areas that require the most funding.*

*Micro-businesses with unregistered locations were not accounted for in the assessment due to limited data.*
What’s next

- Strategy& estimates the total financial requirements at US$ ~3.7 billion, half of it for housing, and a third for businesses

- Local and international donors have pledged US$ 600 million so far, or only ~15% of financial requirements

- Most of the basic needs for housing, food assistance, education, culture and businesses remain unmet. Funding was received by the healthcare sector but is insufficient

- Although some non-public contributions are not captured in the analysis, unmet needs are still expected to be larger than our estimates, as some high-profile announcements of contribution might not materialize

- Pledges made shortly after a disaster generally account for the vast majority of total pledges, and as such contributions are expected to diminish rapidly

- The funding gap is still substantial, and is expected to persist for months to come

- Fundraising campaigns should launch a second round, with 2 priority areas:
  
  - Closing unmet emergency relief (housing, food assistance, cash assistance)
  
  - Longer-term recovery and restoration of livelihoods, with a particular focus on smaller businesses, to protect the fabric of affected communities

- NGOs should continue forming coalitions, both among themselves and with the private sector, to tackle the challenge of scale and avoid duplication of efforts

- Donors can play a key role in smart-funding initiatives that are local, scalable, sustainable, and collaborative
Overview of approach
Beirut explosion impact assessment scope

- Infrastructure impact
- Social impact
- Economic impact

Categories:
- Housing
- Food security
- Healthcare
- Education
- Businesses
- Culture
<table>
<thead>
<tr>
<th>Category</th>
<th>Questions</th>
</tr>
</thead>
</table>
| **HOUSING** | • How many buildings were damaged in the Beirut explosion, by damage level and by district?  
• What is the total cost of rebuilding/repairing the damaged buildings?  
• As a consequence, how many households are in need of shelter support? How much will it cost to fund it? |
| **FOOD SECURITY** | • How many individuals are in urgent or significant need for food assistance in each district?  
• What is the total cost to fund food assistance for one year? |
| **HEALTHCARE** | • How many hospitals and primary care centres were damaged in the Beirut explosion?  
• What is the total cost of repairing the damage?  
• What are the costs related to treating physical injuries and providing mental care support? |
| **EDUCATION** | • How many schools (including TVETs') and universities were damaged in the Beirut explosion?  
• What is the total cost of repairing the damage?  
• How many students are at risk of not having access to their schools? |
| **BUSINESSES** | • How many businesses were damaged in the explosion, by sector, level of damage, and district?  
• How many jobs are on hold temporarily (for a few weeks or months) in each sector?  
• How many jobs were lost?  
• What are the forgone salaries? |
| **CULTURE** | • How many historical sites, heritage buildings or others similar in nature were damaged in the Beirut explosion?  
• What is the total cost of repairing them, while preserving their heritage value? |

1) Technical and Vocational Education and Training  
Source: Strategy& analysis

• What is the economic impact of the explosion in terms of revenue losses?
High-level overview of the methodology for infrastructure impact assessment

- **HOUSING**
  - Based on geo-spatial data from within a 4.1 km radius of the explosion
- **FOOD SECURITY**
  - No related infrastructure impact
- **HEALTHCARE**
  - Based on damages assessed by hospitals and healthcare centers
    - Identified 7 affected hospitals and 16 primary healthcare centers
    - Estimated the damage per facility based on the cost and damage information provided by each hospital and primary health care center
- **EDUCATION**
  - Based on data from within a 4.1 km radius of the explosion
    - Listed all education establishments based on Google Maps data for a 2Km radius
    - Estimated the explosion impact level based on radius from the explosion
    - Estimated costs based on impact level and size of establishment
    - Extrapolated the costs within a 4.1 km radius of the explosion
- **BUSINESSES**
  - Based on data from within a 4.1 km radius of the explosion
    - Listed all businesses based on Google Maps data (on a 2km radius) and segmented businesses into sectors
    - Estimated the explosion impact level based on radius from the explosion
    - Estimated costs based on impact level and size of establishment by sector
    - Extrapolated costs to a 4.1 km radius of the explosion to derive total cost
- **CULTURE**
  - Based on data in the districts affected by the explosion
    - Based on Beirut Build Heritage Rescue, August 2020 report:
      - Quantified the number of cultural sites and buildings
      - Estimated the reconstruction costs depending on severity of damages

Note: Public infrastructure (e.g., port, grain silos, electricity grids, roads) damage was not covered in the analysis.

Source: Strategy& analysis
High-level overview of the methodology for social impact assessment

**HOUSING**
Based on geo-spatial data within a 4.1Km radius of the explosion and MySay survey
- Estimated **uninhabitable households by district**, assuming only houses with severe/moderate damage are no longer habitable
- Estimated **need for temporary housing** (e.g., rent subsidy) by residents' proxy income level\(^1\) per district
- Derived **total costs of sheltering households**, assuming specific cost per month and length of stay, based on damage level and urgency of need

**FOOD SECURITY**
Based on geo-spatial data within a 4.1Km radius of the explosion and MySay survey
- Estimated the **percentage of people in urgent or significant need for food by district** (~15), using survey results and factoring in income levels
- Estimated the **cost of providing food per individual per month** over a specified duration, depending on the need
- Derived **total cost of food assistance provision** for a period up to 12 months

**HEALTHCARE**
Based on data within a 4.1Km radius of the explosion, interviews, and MySay survey
- Estimated the **costs of treating all physical injuries**
- Estimated **number of people requiring mental health support** in highly affected districts only, using survey results

**EDUCATION**
Based on UNICEF’s report; and public database on schools’ capacity
- Estimated the average **number of students per school**
- Estimated **number of students at risk of not being able to go back to schools / TVETs**

**BUSINESSES**
Based on geo-spatial data within a 4.1Km radius of the explosion and MySay survey
- Estimated the **percentage of businesses that are back to work, will be back in weeks, months or will never be back**, by damage level and company size
- Identified **average salary per sector**
- Estimated **number of jobs at risk or lost**, and related share of salaries lost within one year from the explosion

**CULTURE**
Lost jobs in culture have been accounted for under businesses

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\(^{1}\) Estimated based on real estate price index per district

Source: Strategy& analysis
High-level overview of the methodology for economic impact assessment

APPROACH

• Categorized businesses based on sector, size of employment (S, M, L)\(^1\) and damage level from the explosion (none / insignificant, minimal, moderate and severe; based on location)

• Estimated total revenues lost for each sector for a period of one year from the explosion by company size, factoring in damage level and time to return to work

KEY ASSUMPTIONS

• Estimated number of businesses within a 4.1Km radius of the explosion

• Percent of businesses that are back to work, need weeks to return, months to return or will never return, by damage level and company size

• Average revenues per sector and company size

• Percent of revenues lost for businesses that are back to work, need weeks to return, months to return or will never return

SOURCES

• Google Maps data, Expert interviews, MySay survey

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1) Small businesses are assumed to have an average of 5 employees, medium businesses an average of 30 employees; and large businesses an average of 100 employees

Note: Micro-businesses with unregistered locations were not accounted for in the assessment due to limited data

Source: Strategy& analysis
Impact on housing
Methodology for housing assessment
(within a 4.1 Km radius of the explosion)

METHODOLOGY FOR INFRASTRUCTURE ASSESSMENT

APPROACH

- Estimated the number of buildings, apartments, and households affected by level of impact for ~60 districts on Arc GIS
- Estimated the explosion impact level for each building based on distance from explosion
- Derived the construction costs per apartment based on impact level, size and building status
- Derived the total cost of the damage

KEY ASSUMPTIONS

- Impact level coefficients and costs by severity of damage
- Size of property coefficients (Small, Medium, Large Size)
- Building status coefficients (Low, Mid to Low, Mid, Mid to High, High-End)

SOURCES

- UN-OCHA, Expert Interviews, HOTOSM Lebanon Buildings, Khatib & Alami, MySay survey

METHODOLOGY FOR SOCIAL ASSESSMENT

APPROACH

- Estimated the number of households that are severely or moderately damaged by district, and based on infrastructure assessment of residential buildings' damages
- Derived the number of people requiring urgent or minor housing support, based on residents' proxy income level per district and MySay survey results
- Derived the total costs of providing shelter for eligible households

KEY ASSUMPTIONS

- Only severely or moderately damaged houses are considered uninhabitable
- Income levels for each district (L, L+, M, M+, H)
- Percent of households requiring urgent or minor shelter support (survey)
- Average cost of households requiring urgent or minor shelter support (survey)

SOURCES

- UN-OCHA, Expert Interviews, MySay survey

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1) Estimated based on real estate price index
Source: Strategy& analysis
**Overall impact on housing**
*(within a 4.1 Km radius of the explosion)*

<table>
<thead>
<tr>
<th>INFRASTRUCTURE IMPACT</th>
<th>None / Insignificant damage</th>
<th>Minimal damage</th>
<th>Moderate damage</th>
<th>Severe damage</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass failure, limited damage to house structures (e.g., false ceiling, wood panels)</td>
<td>~2,440 buildings</td>
<td>~10,610 buildings</td>
<td>~2,570 buildings</td>
<td>~240 buildings</td>
<td>~15,860 buildings</td>
</tr>
<tr>
<td>Space made uninhabitable/ usable, furniture, window frame, and wood panels damaged</td>
<td>~39,210 households</td>
<td>~122,890 households</td>
<td>~28,980 households</td>
<td>~2,310 households</td>
<td>~193,390 households</td>
</tr>
<tr>
<td>Partition walls shattered, steel frame buildings distorted and pulled away from foundation</td>
<td>~13,300 households due to severe or moderate damage</td>
<td>~13,000 households with minor to urgent need for temporary housing (e.g., rent subsidy)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SOCIAL IMPACT**

- US$ ~30 million total financial requirements for rental
double cost to support displaced people in need of housing

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1) Assumes residents of remaining uninhabitable houses possess second homes or can afford to rehouse themselves
2) Rental costs cover a period of 18 months for houses with severe damage and 4 months for houses with moderate damage

Source: Expert Interviews, UN-OCHA, HOTOSM Lebanon Buildings, Khatib & Alami, MySay survey, Strategy& analysis
Infrastructure impact – Housing
(within a 4.1 Km radius of the explosion)

Source: Expert interviews, HOTOSM Lebanon Buildings, Khalil & Alami, MySay survey, Strategy& analysis
Financial requirements vs. announced pledges – Housing

FINANCIAL REQUIREMENTS AND ANNOUNCED PLEDGES (US$ Million)

<table>
<thead>
<tr>
<th>Costs</th>
<th>Announced pledges</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,860</td>
<td>30</td>
</tr>
<tr>
<td>1,830</td>
<td></td>
</tr>
</tbody>
</table>

SELECTED EXAMPLES OF ANNOUNCED DONATIONS

**US$ 35 million from UNHCR** to shelter and protect the most vulnerable Lebanese, refugees and migrant households in Beirut over the coming months.

**US$ 2+ million from corporations** such as Google, Facebook, Procter & Gamble, PepsiCo and Chanel.

**US$ 2+ million** raised through public crowdfunding campaigns.

SELECTED EXAMPLES OF IN-KIND DONATIONS

**138 tons of glass** donated by the UAE to help repair more than 1,000 destroyed homes and small businesses by covering ~9,000 sqm.

**Quantities of aluminum and glass** to be provided by private companies in Cyprus.

**Hundreds of free shelters** offered by the Lebanese community and hotels.

Note: Announced pledges do not include in-kind donations.

Source: Impact Lebanon for announced financial pledges, Strategy& analysis.
Impact on food security
Methodology for food security assessment
(within a 4.1 Km radius of the explosion)

METHODOLOGY FOR SOCIAL ASSESSMENT

APPROACH

• Estimated the percentage of people in urgent or significant need of food by district, using MySay survey results and factoring in the average income level of the districts’ residents
• Estimated cost of providing food per individual for a month and number of months required (based on urgency of need)
• Derived total cost of providing food assistance

KEY ASSUMPTIONS

• Percentage of people requiring moderate or urgent need of food assistance in lower income districts
• Cost of providing food assistance per individual, by need level
• Number of months of food provision needed

SOURCES

• UN-OCHA, MySay survey, Expert Interviews
Social impact – Food security
(within a 4.1 Km radius of the explosion)

Note: Food assistance requirements were assessed based on MySay survey results; which asked about food needs as a consequence of the blast. However, these needs could be accentuated or influenced by pre-explosion conditions (COVID-19 impact and / or economic crisis).

Source: OCHA, MySay survey, Expert Interviews, Strategy& analysis
# Financial requirements vs. announced pledges – Food security

## Financial Requirements and Announced Pledges

### Selected Examples of Announced Donations

<table>
<thead>
<tr>
<th>Cost of food assistance</th>
<th>Announced pledges</th>
</tr>
</thead>
<tbody>
<tr>
<td>US$ ~25 million</td>
<td>In foreign aid from international countries</td>
</tr>
<tr>
<td>US$ ~7.5 million</td>
<td>from USAID</td>
</tr>
<tr>
<td>US$ ~2.5 million</td>
<td>from corporations such as Google, Facebook, Procter &amp; Gamble, PepsiCo, Chanel, Citi, H&amp;M Foundation</td>
</tr>
</tbody>
</table>

### Selected Examples of In-Kind Donations

<table>
<thead>
<tr>
<th>Country</th>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>~660 tons</td>
<td>Food</td>
</tr>
<tr>
<td>Morocco</td>
<td>295 tons</td>
<td>Food</td>
</tr>
<tr>
<td>USA</td>
<td>~25 million</td>
<td>Foreign aid</td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>~10 tons</td>
<td>Flour</td>
</tr>
<tr>
<td>Spain</td>
<td>1.5 million</td>
<td>Cheese</td>
</tr>
<tr>
<td>Germany</td>
<td>1 million</td>
<td>Portions of Kiri and Picon</td>
</tr>
</tbody>
</table>

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1) Factors for in-kind donations
Source: Impact Lebanon, Strategy& analysis
Impact on healthcare
Methodology for healthcare assessment

METHODOLOGY FOR INFRASTRUCTURE ASSESSMENT

Based on data shared by service providers

APPROACH

- Identified 17 affected hospitals and 16 primary healthcare centers
- Estimated the damage per hospital and primary healthcare center based on the cost and damage information provided by each facility

KEY ASSUMPTIONS

- N/A

SOURCES

- Service Providers, Expert Interviews, Lebanon Needs

METHODOLOGY FOR SOCIAL ASSESSMENT

Based on data within a 4.1km radius of the explosion

APPROACH

- Estimated cost of treating all physical injuries
- Estimated percentage of people in highly affected areas that require limited, moderate and urgent mental health support
- Estimated number of people requiring mental health support, and the ones requiring medical support, in highly affected areas only, using survey results

KEY ASSUMPTIONS

- Residents of damaged houses are more prone to require mental health support
- Only people with moderate to high need of support are accounted for
- Number of sessions required for moderate or intensive treatment
- Average cost of hospitalization and average length of stay by injury severity
- Cost per psychology session and cost of medical treatment

SOURCES

- MySay survey, Expert Interviews
**Infrastructure impact – Healthcare**

- Total US$ 68 – 75 million for 7 out of the 17 damaged hospitals; US$ ~66 million are for the 4 severely damaged ones.

- **US$ 8 million (10%)**
  - Karantina Hospital

- **US$ 2 million (3%)**
  - LAU MC – Rizk Hospital

- **US$ 2 million (3%)**
  - AUB - MC

- **US$ 1.2 million (3%)**
  - Hôtel-Dieu De France

- **US$ 7 million (10%)**
  - Geitaoui Hospital

- **US$ 13 – 15 million (19%)**
  - Hôpital des Sœurs du Rosaire

- **US$ 35 – 40 million (52%)**
  - Saint George Hospital

**Total US$ ~70K for 16 damaged Primary Health Care Centers**

Source: Interviews, Lebanon Needs, Strategy& analysis
Social impact – Health
(within a 4.1 Km radius of the explosion)

SOCIAL IMPACT

~6,500
Individuals with moderate to critical injuries (hospitalized)

~1,300
of hospitalized individuals underwent surgery

~145,000
Individuals needing psychological support

Moderate need for mental care ~121,000 Individuals
Urgent need for mental care ~24,000 Individuals

80
US$ Mn
total financial requirements
Financial requirements vs. announced pledges – Healthcare

FINANCIAL REQUIREMENTS¹ AND ANNOUNCED PLEDGES² (US$ Million)

155

80

75

US$ 18 Mn for physical injuries (covered by the Lebanese Ministry of Health), and US$ 62 Mn for mental health

Costs

Announced pledges

SELECTED EXAMPLES OF ANNOUNCED DONATIONS

US$ ~30 million in foreign aid from regional and international countries

Canada  USA  UK  Australia  Italy

US$ ~7.5 million

US$ ~2.5 million from corporations

US$ 2+ million raised through public crowdfunding campaigns

SELECTED EXAMPLES OF IN-KIND DONATIONS

Medical supplies

<table>
<thead>
<tr>
<th>Country</th>
<th>60 tons</th>
<th>40 tons</th>
<th>40 tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lebanon</td>
<td>Jobs for</td>
<td>UAE</td>
<td>Norway</td>
</tr>
<tr>
<td>Morocco</td>
<td>WHO</td>
<td>Iraq</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>USA</td>
<td>France</td>
<td>Italy</td>
</tr>
<tr>
<td>USA</td>
<td>UK</td>
<td>US Army</td>
<td></td>
</tr>
</tbody>
</table>

Field hospitals

<table>
<thead>
<tr>
<th>Country</th>
<th>550 beds</th>
<th>58 beds</th>
<th>50 beds</th>
<th>50 beds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qatar</td>
<td>Jordan</td>
<td>Russia</td>
<td>Morocco</td>
<td></td>
</tr>
</tbody>
</table>

Other

600 chemical protection suits

Denmark

1) Financial requirements do not cover cost of medical supplies required
2) In-kind donations in the form of medical supplies have been excluded; however cost of treating physical injuries have been included as it is assumed to be covered by MoH

Source: Impact Lebanon, Strategy& analysis
Impact on education
Methodology for education assessment
(within a 4.1 Km radius of the explosion)

METHODOLOGY FOR INFRASTRUCTURE ASSESSMENT

APPROACH

- Listed all education establishments (schools and universities) based on Google Maps data within 2km radius from the explosion
- Calculated impact level based on distance from explosion
- Estimated costs based on impact level and size of establishment
- Derived the final cost of damages
- Extrapolated the cost of damages to a 4.1km radius from explosion

KEY ASSUMPTIONS

- Impact level coefficients and costs by severity of damage
- Size of property coefficients (Small, Medium, Large Size)
- Average Capex cost per m²

SOURCES

- UNCHR Reports, Expert Interviews, Google data, MySay survey

METHODOLOGY FOR SOCIAL ASSESSMENT

APPROACH

- Listed all schools and TVETs based on Google Maps data within 2km radius from the explosion
- Identified number of students in each of these schools
- Estimated average number of students for the ones with no data
- Derived number of students at risk of not being able to go back to school or TVETs, based on total number of schools and TVET centers damaged

KEY ASSUMPTIONS

- Average number of students in a school (extrapolated based on available data)

SOURCES

- Google maps data, UNICEF, UN-OCHA, Ministry of Education
Overall impact on education
(within a 4.1 Km radius of the explosion)

**INFRASTRUCTURE IMPACT**

~8 universities damaged

~140 schools and TVETs damaged within 4.1Km radius

**SOCIAL IMPACT**

~67,000 students impacted due to schools and TVETs damages

US$ ~60 million total financial requirements

1) Larger than 4.1Km radius from the explosion

Note: Costs to cover tuition fees were not factored for in this assessment

Source: UNCHR Reports, Expert Interviews, Google data, Khatib & Alami, MySay survey, Strategy& analysis
### Financial requirements vs. announced pledges – Education

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
<th>Announced pledges</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost of Reconstruction</strong></td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

#### Financial Requirements¹ and Announced Pledges (US$ Million)

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
<th>Announced pledges</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US$ 1.2 million</strong> from UNESCO</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>US$ 0.4 million</strong> raised through public crowdfunding campaigns</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ This assessment did not include the cost of covering tuition fees.

Source: Impact Lebanon, Strategy& analysis
Impact on businesses
Methodology for businesses assessment
(within a 4.1 Km radius of the explosion)

METHODOLOGY FOR INFRASTRUCTURE ASSESSMENT

APPROACH

• Listed all business establishments based on Google Maps data (2Km) and segmented them into 7 sectors: Food and Drink, Shopping, Leisure, Lodging, Non-Consumer, Services, Other
• Calculated impact level based on distance from explosion
• For each sector, estimated costs based on impact level and size of establishment
• Derived the final cost of damage
• Extrapolated the cost of damage within a 4.1km radius of the explosion

KEY ASSUMPTIONS

• Impact level coefficients and costs by severity of damage
• Size of property coefficients (Small, Medium, Large Size)
• Average Capex cost per m²

SOURCES

• Expert Interviews, Google Maps data, MySay survey

METHODOLOGY FOR SOCIAL ASSESSMENT

APPROACH

• Categorized Google Maps data on businesses based on sector, size of employment and severity of damage
• Estimated total jobs that are temporarily on hold and total jobs lost; and related share of foregone salaries, by sector, within one year from explosion
• Extrapolated the cost of damage within a 4.1km radius of the explosion

KEY ASSUMPTIONS

• Percentage of businesses that are back to work, in weeks, months or not returning, by damage level and company size; and expected percent loss in salaries for each
• Businesses that are beyond 2km radius faced low or minor level of damage
• Average salary by sector

SOURCES

• Expert Interviews, Google Maps data, MySay survey

1) Small businesses are assumed to have on average 5 employees, medium businesses an average of 30 employees; and large businesses an average of 100 employees
Note: Micro-businesses with unregistered locations were not accounted for in the assessment due to limited data
Source: Strategy& analysis
Strategy&

Infrastructure impact – Businesses by sector
(within a 4.1 Km radius of the explosion)

~45% of the businesses affected are shopping and services related

Non-consumer, lodging and leisure businesses will need around 70% of funding, around US$ 570 million

Most of the affected businesses are small businesses, requiring around US$ 470 million

Source: Expert Interviews, Google Maps data, MySay survey, Strategy& analysis

1) Size of business in square meters
2) Banks, corporate offices and embassies
3) Uncategorized small businesses such as computer shops, beauty salons, art studios
Social impact – Businesses by sector
(within a 4.1 Km radius of the explosion)

NUMBER OF JOBS AFFECTED (in 000s)

<table>
<thead>
<tr>
<th>Category</th>
<th>Jobs on hold for weeks</th>
<th>Jobs on hold for months</th>
<th>Jobs lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVICES</td>
<td>45</td>
<td>37</td>
<td>4</td>
</tr>
<tr>
<td>NON-CONSUMER</td>
<td>28</td>
<td>23</td>
<td>3</td>
</tr>
<tr>
<td>SHOPPING</td>
<td>20</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>FOOD AND DRINKS</td>
<td>16</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>LEISURE</td>
<td>6</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>LODGING</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>OTHER</td>
<td>10</td>
<td>9</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Some examples of businesses under services include airlines, banks, training centers, doctors’ clinics. Other section includes art studies, designers, shipping.
Micro-businesses with unregistered locations have been excluded from the assessment.
Source: Expert Interviews, Google Maps data, MySay survey, Strategy& analysis

Directional

- Total jobs on hold for weeks: ~104,000
- Total jobs on hold for months: ~10,500
- Total jobs lost: ~15,500
- Total jobs directly impacted: ~130,000

EQUIVALENT SALARY LOSS

<table>
<thead>
<tr>
<th>Category</th>
<th>Equivalent Salary Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVICES</td>
<td>US$ 80 Million</td>
</tr>
<tr>
<td>NON-CONSUMER</td>
<td>US$ 50 Million</td>
</tr>
<tr>
<td>SHOPPING</td>
<td>US$ 30 Million</td>
</tr>
<tr>
<td>FOOD AND DRINKS</td>
<td>US$ 25 Million</td>
</tr>
<tr>
<td>LEISURE</td>
<td>US$ 15 Million</td>
</tr>
<tr>
<td>LODGING</td>
<td>US$ 15 Million</td>
</tr>
<tr>
<td>OTHER</td>
<td>US$ 15 Million</td>
</tr>
</tbody>
</table>
Financial requirements vs. announced pledges – Businesses

<table>
<thead>
<tr>
<th></th>
<th>Financial requirements</th>
<th>Announced pledges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Salary Losses</td>
<td>1,095</td>
<td>230</td>
</tr>
<tr>
<td>Cost of Reconstruction</td>
<td>865</td>
<td></td>
</tr>
</tbody>
</table>

SELECTED EXAMPLES OF ANNOUNCED DONATIONS

**US$ 0.75 million** raised through public crowdfunding campaigns and associations

- gofundme
- GlobalGiving
- JustGiving
- Mophradat

**US$ 0.3 million** from Facebook Journalism Project and the International Center for Journalists

Source: Impact Lebanon, Strategy& analysis
Infrastructure and social impact – Micro businesses

Micro businesses have been severely affected by the explosion; however, with the absence of data, it is difficult to quantify:

- Out of a sample size of ~1,550 micro-businesses within 5km of the explosion, nearly ~115 have been damaged (11 total destruction, 55 major damages, and 50 minor damages)
- On average, cost of reconstruction per sampled micro-business ranges between US$ 1,000 and US$ 3,000
Impact on culture
Damage to cultural heritage

- Historical areas and cultural fabric have been damaged in: Mar Mkhayel, Sayfi, Gemmayze, Jeitawi, St Nicolas, Zukak blat, Minat al Hosn and Bachura.
- Heritage buildings have been damaged: 85 severely damaged, 370 moderately damaged and 25 slightly damaged.
- Additional buildings with special features (e.g., pitched roof from the 19th century) in surrounding areas (e.g., Medawar) have been also affected.

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1) Damage ranges from loss of openings and cracks, to detachment of elements of the building, to total collapse.
Cultural heritage funding requirements

- Funding required covers the reconstruction of 640 affected cultural buildings (480 heritage buildings and 160 buildings with special features).

- UNESCO launched the “Li Beirut” initiative to support the rehabilitation of schools, historic heritage buildings, museums, galleries and the creative economy.

**US$~285 Million**

- 1% US$ 4 million ceilings, painted walls, artworks
- 2% US$ 5 million timber ceilings
- 5% US$ 15 million design, supervision, and unforeseen expenses
- 10% US$ 29 million structural propping and roofing
- 34% US$ 95 million interior works
- 48% US$ 137 million elevation works

Source: Ministry of Culture – Directorate General of Antiquities, UNESCO Statement of Solidarity, Strategy& analysis
Thank you

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