Strained access to infrastructure and resources in Lebanon:
Identifying opportunities for inclusive aid for Syrian refugees and host communities

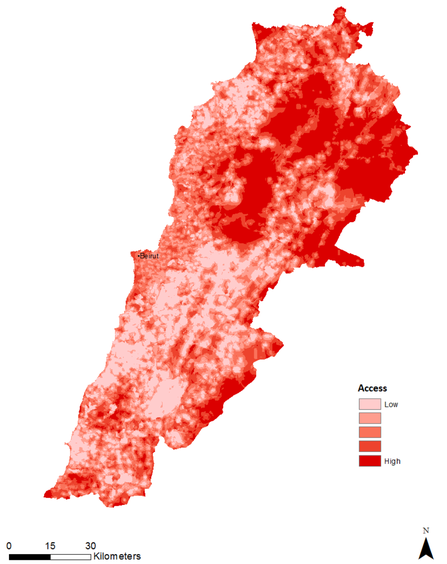
Introduction

Lebanon is currently host to the largest number of Syrian refugees, with estimates of over 1 million Syrian refugees in a country of 4.3 million; therefore, 1 in every 4 persons in Lebanon is Syrian. The Lebanese government decided not to set up any refugee camps. However, refugees have been settling not only in houses, apartments and garages but also in tents, thus leading to makeshift camps around the country. Although Lebanese communities initially welcomed refugees, the large increase in refugees entering the country has begun to put pressure on Lebanon's already strained infrastructure and economy. In a context where refugee camps are not being demarcated or established by either the government or humanitarian actors, it is important to understand where refugees are settling and what infrastructure is accessible in those areas. More importantly, it is important to identify where in Lebanon was access to infrastructure and resources already strained previous to the arrival of Syrian refugees. This information can help humanitarian aid agencies target their interventions not only for the displaced, but also for the local communities where the displaced are living, which may already be under strain.

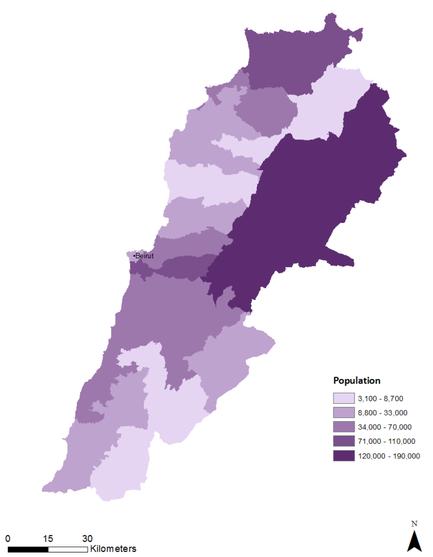
Methodology

This analysis was produced through a two-step process. **The first step** involved identifying areas in Lebanon that had limited access to selected infrastructure and resources and were under strain previous to the inflow of Syrian refugees. In order to do this, I ranked Lebanon's 1643 municipalities using a scale of 1-5 and looked at five factors: access to schools, agricultural lands and roads as well as hospital density, and population density. These categories were chosen to represent access to different infrastructure that addresses different needs. These are also the kind of infrastructure and resources that may be particularly affected by flow of refugees in need of medical care for physical and psychological injuries, or maybe in need of informal seasonal farm work or cheaper food. The population density was used in order to aid in measuring the strain put on the selected infrastructure by the Lebanese population before the inflow of refugees. The ranking consisted of 1 (good) - 5(bad) and was created through the use of raster data and aggregated by a weighted calculation. For each infrastructure, the ranking was conducted in accordance to the infrastructure's characteristics. In the final aggregated map, numbers on the higher end of the spectrum (5) indicated areas with strained overall access to infrastructure and resources. **The second step** required identifying where Syrian refugees in Lebanon are settling and analyzing if refugees were settling in areas already strained.

Locations of Strained Access to Infrastructure and Resources



Syrian Refugees Registered by February 2015



Results

This project sought to answer two questions:

- Where in Lebanon are refugees settling?
- Are refugees located in areas where access to infrastructure and resources was already strained to the local population?

In light of the two spatial questions, an analysis should be conducted at two levels: at the municipality level and at the district level for comparison to location of Syrian refugees. However, because our population data for Syrian refugees is only available at the district level, the most relevant analysis must be conducted from there first. At the district level, we see that the majority of Syrian refugees are settling in Baalbek, Zahle and Akkar, which are all areas bordering Syria. Bcharre has the lowest number of refugees. Both Baalbek and Akkar are two of the districts under the highest strain. Therefore, taking into consideration that these districts hold the largest numbers of refugees and that their own local populations were living under high strained access to infrastructure and resources before the inflow of refugees, it is possible to infer that these are the most appropriate targets for inclusive interventions by state, humanitarian and development actors. However, it is important to note that Baalbeck, as Bcharre and

Akkar, showed the largest gap between their min. and max. strain ranks, as shown in the table. This means that there is a rather big difference between the municipalities' strain rankings. This indicates that more accurate data can be retrieved if the population data on Syrian refugees was by municipality, allowing for a more precise identification of the strained municipalities where Syrian refugees are now living in these districts.

Table 1: District ranks and Syrian refugee population data

District	Syrian Refugee Population	MIN	MAX	RANGE	MEAN
Zahle	191,715	1	4.35	3.35	2.55
Baalbek	**131,188**	**1.4**	**4.8**	**3.4**	**3.43**
Akkar	107,872	1.7	4.6	2.9	3.11
Baabda	98,245	1	3.65	2.65	2.44
West Bekaa	69,915	1.25	4.1	2.85	2.57
Aley	64,001	1	3.7	2.7	2.48
El Minieh-Dennie	62,815	1.45	4.55	3.1	3.12
Tripoli	61,989	1.8	3.3	1.5	2.67
El Meten	60,625	1.4	4.2	2.8	2.75
Chouf	54,945	1	3.8	2.8	2.43
Saida	49,715	1	3.85	2.85	2.52
Sour	33,058	1.5	4.15	2.65	2.74
Beirut	32,161	2.6	3.85	1.25	3.06
El Nabatieh	30,255	1.15	4.2	3.05	2.85
El Batroun	17,478	1.8	4.4	2.6	3.11
El Koura	17,132	1.4	3.9	2.5	2.59
Kesrwane	16,448	1.8	4.3	2.5	3.12
Zgharta	13,779	1	3.7	2.7	2.43
Rachaya	12,001	1.45	4.6	3.15	2.97
Bent Jbeil	8,709	1.4	4.35	2.95	2.71
Marjaayoun	8,118	1.2	4.05	2.85	2.78
El Hermel	6,614	1.25	4.2	2.95	3.26
Hasbaya	5,955	1.15	4.35	3.2	2.93
Jbeil	5,947	1.5	4.2	2.7	3.12
Jezzine	3,280	1	3.35	2.35	2.12
Bcharre	**3,107**	**1.5**	**4.35**	**2.85**	**3.27**

Limitations

There were several limitations to finding the appropriate data to conduct this analysis. The factors chosen to represent infrastructure and resources were very basic and limited due to the lack of data concerning factors such as water and sewage systems, electricity, housing, etc. It is extremely difficult finding population data for Lebanon. Population data on refugees is more readily available, however only in larger administrative level. The analysis would have been much more specific and perhaps accurate if I had access to the population data of Syrian refugees by municipality in Lebanon. I could have then predicted the current strain by adding the population density of Syrian refugees in those localities to

Cartographer: Najia Mohamed
Date: May 5th, 2016
Projection Coordinate: WGS_1984_UTM_Zone_36
Sources:Council for Development and Reconstruction (CDR); UN OCHA; GLC Data 2000 UNHCR
THE FLETCHER SCHOOL
TUFTS UNIVERSITY