

A Descriptive Environmental Assessment for Syrian Refugees in Lebanon

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Abstract: presence of refugees, regardless to their identity, in any country can lead to environmental costs at the hosting community. The evaluation of Syrian refugee's impact in Lebanon was made by a qualitative descriptive method based on examination of field and available data. According to all observations, air quality is deteriorating from increasing harmful activities like on-road transport, burning solid waste, residential heating, and electricity production. Furthermore, water resources are being overstressed and water quality is affected. The increase in solid waste quantity made several negative results on solid waste management infrastructure and general health. Changes in land use were noticed due to an increase in urban densification and informal tented settlements. A corrective measure was suggested in the end supported by facts cited above as an evidence and a proof for decision makers in order to put up this document and solve this serious crisis.

I. Introduction

A big, complex, moral, humanitarian and development issue is identified as the new 21st century challenge: "the refugee's issue". It's not a new phenomenon but it has increased enough nowadays and world media had shown horrible pictures of persons moving away their homes to seemingly, places of safety. Central America, Africa, the Middle East and Southeast Asia are the most regions of the world where people are escaping the miserable effects of war and natural disasters (UNHCR, 2012). Realistically, no part of the world today is impervious to a refugee situation (Earl E. et al., 1983). The entrance of refugees in any country brings both cost and benefit to the host area (KC and Nagata, 2006). Host countries responded differently to these mass influxes; some governments have received refugees with generosity, providing them with support and guaranteeing their security. Others have tried to avoid refugees from incoming or have treated them cruelly, restricting their movements and even endangering their safety (Jacobsen, 1994). Countries that host refugees for prolonged periods can experience long-term, economic, social and environmental consequences (UNHCR Standing Committee, 1997). Evidence shows that large-scale dislocation of people, characteristic of many recent refugee crises, can create adverse environmental impacts. The level and suddenness of refugee flows can quickly change a condition of relative abundance of local resources to one of acute scarcity (UNHCR, 2005). The geographical location of Lebanon made it one of the most Middle East countries welcoming refugees from his neighbors by all over his land borders, due to political conflicts in their places. Lebanon has known a huge influx of refugees since the beginning of the Syrian conflict in 2011. According to the United Nations High Commissioner for Refugees (UNHCR), on 30 September 2016, the total number of Syrian refugees in Lebanon was equivalent to 1,017,433 (refugees waiting to be registered are not included), in addition to between 300,000 and 500,000 unregistered refugees throughout Lebanon (Norwegian Refugee Council/International Rescue Committee, 2015). So, Lebanon is dealing now with around one and a half million Syrian refugees on his land.

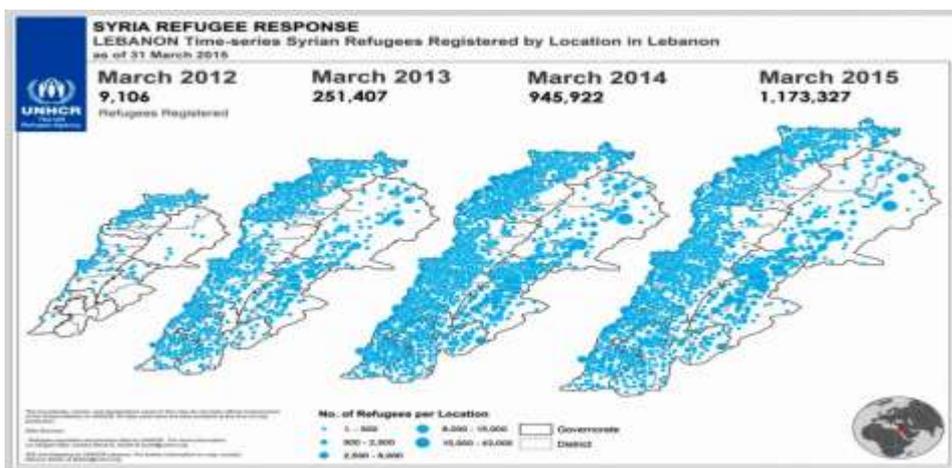


Figure 1: A map conducted by UNHCR showing the evolution of distribution of Syrian refugees all over Lebanon with their numbers

II. Methodology

The present evaluation is based on actual probable number of Syrian refugees in Lebanon which is around 1.5 million without taking in consideration that unregistered number of refugees may be way more than the one predicted by the Norwegian Refugee council listed above. The year of 2011 was used as a baseline to determine the environmental pre-crisis situation depending on data availability in each field. The report describes environmental impacts in November 2016 in four sectors: air pollution, water, solid waste, and land-use. Indoor and field group meetings was organized between the team working members to identify several environmental impacts that are influencing on the Lebanese current environmental situation, after compiling relevant environmental information, analyzing, and summarizing the most influential effects, in order to understand more the actual results of hosting such these numbers of refugees and to help decision makers while treating and discussing refugees crisis in Lebanon to the benefit of the environment in Lebanon and ultimately the population in concern. It's very important to insist that this report is not directed to a specific people or nationality, because our work would be the same when such an abnormal and unusual situation happens in our country regardless to the nationality of refugees.

III. Results

The assessment focused on the four environmental sectors cited above:

a. Air quality:

The main areas affecting air quality in Lebanon and increasing pollution due to the Syrian conflict and refugee's presence or simply due to the sudden increase of population are the following:

- On-road transport:

Most of NO_x and CO emission in Lebanon are due to the transport sector and mostly concentrated on main axes and cities. In addition, emission in Particulate matter (PM) can be detected from traffic. An increase in traffic in Lebanon and mostly main cities was clearly detected after the beginning of the Syrian conflict which will cause an increase in CO, NO_x and PM concentration in the Lebanese air and will lead to higher rate in respiratory and lung disease.

- Residential heating:

SO_2 released quantity into the air increased from heating activity including wood, liquefied petroleum gas and diesel oil, and was estimated to 5% in 2012 (Waked *et al.*, 2012). This increase can be better detected in small geographic areas where high concentration of refugees is present.

- Burning solid waste:

With the absence of a real treatment of solid waste in Lebanon, burning is one of the solutions used to get rid of it which results a release in toxic and carcinogenic compounds like dioxins (PCDD) and furans (PCDF), directly influencing health of population living nearby open dumps.

- Electricity production

NO_x , SO_2 , and PM are released by power plants and private generators which are frequently used in Lebanon to respond to electricity shortage and cover all electricity demand on national level. In 2013, 251 Megawatt was the estimated value of increasing demand on electricity due to the Syrian refugees in Lebanon (World Bank, 2013).

b. Water

Water sector was affected on the following key segments:

- Water resources:

A report done by UNHCR (UNHCR, 2014) showed that in the north of Lebanon where water is highly available, water consumption per refugee attends 145 liters per day, which may be considered as a higher estimate. The average estimated value considered in our report will be the half of the higher one. So, water demand of total refugee will be 108.75 million liter per day with regard to the total registered and unregistered numbers of refugees taken in consideration in our report. All these needs are stressing on water resources and groundwater resources in particular. A decrease in water volume at rivers and in number of wells was noted in many areas of Lebanon.

- Water quality:

New disease linked to water has been appearing after the Syrian conflict in Lebanon and many diarrheal diseases has been reported due to poor water quality. Many refugees living around rivers are using it as a toilet which can make it more contaminated. In addition, wastewater discharge constitutes a main source of water pollution in Lebanon. Most of wastewater is not treated and is ejected into open lands or watercourses which may affect groundwater specially where soil infiltration is high. Thousands of additional tons of BDO_5 are produced by Syrian refugees per year causing an increase in organic biodegradable loads. All of this has been generating negative effects on recreational and drinking water, fish and wildlife populations as on soil and agricultural crops.

Informal tented settlements are changing land use and mostly transform agricultural areas or with large agricultural trends into tents zones. In further, there is a high impact on forest resources which are close to their settlements. Syrian refugees are benefiting from the absence of laws application in Lebanon by illegal felling of forest without any fear from being captured and are using it as an alternative energy source especially in winter season (Figure 3).



Figure 3: a Syrian was busted by our camera while illegal felling trees in Minieh near an informal tent settlement.

IV. Corrective measures

Lebanon was already suffering from various environmental problems before the Syrian conflict so we are not blaming Syrian refugees for every single problem we are dealing with, but this situation was clearly aggravating existing environmental troubles. We suggest here a simple solution without entering in details of every environmental impact. It's important to understand that Lebanon with its 10452 km², and already existing 450,000 registered Palestinian refugees according to UNRWA, cannot basically host any Syrian refugee. Lebanon is suffering now from an extremely high population density which make impossible to deal with it ecologically. It has been established that an ideal population density is between 50 and 100 people per square kilometer while it's more than 5 times in Lebanon. There is no land in planet that can respond to ecological needs for its population with such a high density which makes it far away from a sustainable development. The best way to deal with this problem before it's too late is to activate diplomatic channels and distribute Syrian refugees to all other surrounding Arabic countries while the majority of them are not hosting any single refugee. In addition, there are a lot of safe areas in Syria which its whole are is about 185,180 km², so it's so easy to find some zones where safety is present until the end of war. Here it's very important to notice that the Lebanese official authorities must deal with this problem now with all other relevant foreigner authorities in order to find an applicable solution.

V. Conclusion

During this study, an environmental assessment for the Syrian refugees in Lebanon was done in a descriptive qualitative method. According to this evaluation, additional ecological problems was added to already existing ones affecting air, water and soil quality apart from all other influences attached to them. Available data was used to evaluate environmental impacts by group meetings to determine the most affected fields in order to push decision makers to deal with this situation before a demographic explosion occurs. It is obvious that the presence of Syrian refugees in Lebanon is aggravating environmental conditions and generating many harmful effects, so we suggested a political diplomatic solution because environmental measures are impossible with such a high population density and a very small land area.

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