Assessing Site Suitability for Rebuilding Port-au-Prince, Haiti

Introduction

The January 12, 2010 earthquake has left Port-au-Prince in rubble and thousands homeless. These people need to be moved as quickly as possible from the tent camps where they are currently living to formal housing that will provide them with adequate shelter and provide for their basic needs. This is important not only to provide shelter, but also to help the earthquake victims’ lives return to normalcy. A necessary step before large scale relocation is to examine what land is available that is suitable for housing. This project provides an example of how GIS can be used to determine locations for rebuilding.

Project goals:
- Determine what land is suitable for rebuilding in the area around Port-au-Prince
- Determine how much of this land would be needed to rehouse the homeless earthquake victims.

Input Maps

The first step of the analysis was to measure the straight line distance around nine criteria features using the following ratings, where 4 is most suitable and 1 is least:

- Distance from fault line and coast:
  - >150 meters = 4; 150-1000 meters = 3; 1-3 kilometers = 2; <1 kilometer = 1
- Distance from drainage line:
  - >150 meters = 4; 150-500 meters = 3; 50-150 meters = 2; <50 meters = 1
- Distance from open space, major road, health center, schools and employment centers:
  - 0-500 meters = 4; 500-1000 meters = 3; 1000-1500 meters = 2; >1500 meters = 1
- Slope:
  - 0.5% = 4; 5-10% = 3; 10-15% = 2; >15% = 1

The January 12, 2010 earthquake has left Port-au-Prince in rubble and thousands homeless. To create the housing suitability map, the following weights were applied to each of the criteria features:

- Faults = 20%
- Drainage = 15%
- Coast = 15%
- Slope = 15%
- Road = 10%
- Health centers = 10%
- Employment = 5%
- Schools = 5%
- Open Space = 5%

The same ranking was applied, with 1 noting the least suitable lots and 4 the most suitable.

Discussion

The results of my analysis show that there is sufficient high quality land to rehouse the estimated 1.2 million people who became homeless in the January 12, 2010 earthquake. This is fortunate as the literature shows that lack of safe sites for housing puts residents at high risk for future loss of housing in the event of natural disaster. It is possible that more than 41.99 square kilometers of land would receive a ranking of 4 in this model. The data set I had for schools, health centers and employment centers was incomplete. This information is changing almost daily on the ground as functions move buildings as new, more structurally sound options become available and others are rebuilt in temporary or more permanent spaces.

However, in my analysis, I did not assume there are any existing usable structures on the land because of the lack of data on existing built structures. I also did not have any data on parcel ownership, so it is possible that the 71 lots I identified are not available because they currently have a usable structure sited on the land or are held by private owners who would like to use them for non-housing uses. It is also possible that Haitians would prefer an average ranking different from the 59,718 people per square kilometer that I used in my analysis.

Therefore, this work is limited in the information it provides that could be used to plan housing sites. A look at conditions on the ground would be required to verify the results from the GIS analysis. However, these results provide a basis for how a more complete analysis could be conducted. Ideally, a future analysis would take into account the preferences of Haitians for location of housing, such as which amenities and natural features should be considered key criteria and what distances should be established.

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