Brazilians are particularly concerned with the impact of extreme weather, caused by global warming on its citizenry. According to the United Nations Office for Disaster Risk Reduction, the three most damaging natural disasters in Brazil are floods, landslides, and droughts.

It is not enough to simply target the areas of greatest risk as populations are affected differently by natural disasters. Likewise, it is important to determine the locations for people who are most likely to experience vulnerability. According to many scholars in the gender field, children, the elderly, people with disabilities, and female headed household are population groups most vulnerable to natural disasters due to unique physical limitations and social expectations. As these groups have different needs, conducting a social vulnerability analysis disaggregated by social group can help bring the necessary aid to the correct area in a timely manner.

Creating an analysis of composite risk and vulnerability comprised of first creating an environmental risk analysis and a separate a vulnerability analysis. The environmental risk data involved reclassifying existing raster data for global flood, landslide, and drought to levels of low to high risk within Brazil and utilizing the zonal statistics as table to assign each municipality a score for these environmental factors of which the maximum score is 3 and the minimum as 0.

The vulnerability assessment focused on population groups most likely to experience vulnerability. From my literature analysis, these population groups are the elderly – which I defined as over 80 years old, people with disabilities, female headed households – as they are more often than not male headed households to live below the poverty line, and young children – which I defined as under four years old. Taking these groups as a percentage of the municipal population translated to assigning high levels of vulnerability to municipalities with high percentage of these populations and low vulnerability with low percentage on a scale from 0–3. When added, each municipality could receive a score between 0 – 12 for the four different population groups. A composite vulnerability and risk analysis brings these two together by joining the mean composite environmental risk score by municipality and adding this to the four population groups producing a score from 0 – 13, which I defined as over 80 years old, people with disabilities, female headed households, and young children.

When disaggregating the data by type of environmental disaster (flood), the loci of greatest need is different which highlights the importance of disaggregated data.

The composite risk and vulnerability assessment shows that many municipalities along the coast of Brazil and in the border near Uruguay have the highest score when combining these two assessments. This table shows the number of people most likely to experience vulnerability in the most at risk municipalities in Brazil.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Total Population</th>
<th>Over 80</th>
<th>Under 4</th>
<th>Female HH head</th>
<th>People with Disabilities</th>
<th>Vulnerability Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedro Velho</td>
<td>14,114</td>
<td>386</td>
<td>1,218</td>
<td>1,164</td>
<td>4,757</td>
<td>13.0</td>
</tr>
<tr>
<td>Leite</td>
<td>1,537,704</td>
<td>29616</td>
<td>96,529</td>
<td>161,406</td>
<td>421,359</td>
<td>12.5</td>
</tr>
<tr>
<td>Doña Francisca</td>
<td>3,401</td>
<td>122</td>
<td>178</td>
<td>269</td>
<td>864</td>
<td>12.0</td>
</tr>
<tr>
<td>Porcúncula</td>
<td>17,760</td>
<td>452</td>
<td>1,225</td>
<td>1,884</td>
<td>4649</td>
<td>12.0</td>
</tr>
<tr>
<td>São José De Mipibu</td>
<td>39,776</td>
<td>749</td>
<td>3,266</td>
<td>2,979</td>
<td>12,357</td>
<td>12.0</td>
</tr>
<tr>
<td>São Miguel De Tapiu</td>
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<td>138</td>
<td>584</td>
<td>581</td>
<td>1,953</td>
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<tr>
<td>Araçagiaba</td>
<td>18,156</td>
<td>227</td>
<td>1,554</td>
<td>1,438</td>
<td>5,368</td>
<td>12.0</td>
</tr>
<tr>
<td>Condado</td>
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<td>346</td>
<td>1,995</td>
<td>2,060</td>
<td>7291</td>
<td>12.0</td>
</tr>
</tbody>
</table>

The same process was applied to flood risk alone rather than all three environmental factors together.

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<th>People with Disabilities</th>
<th>Flood Risk + Vulnerability Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solânea</td>
<td>26693</td>
<td>737</td>
<td>2186</td>
<td>2753</td>
<td>8427</td>
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<tr>
<td>Camuru</td>
<td>17183</td>
<td>508</td>
<td>1206</td>
<td>1369</td>
<td>5102</td>
<td>11.5</td>
</tr>
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<td>Porcúncola</td>
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<td>1,225</td>
<td>1,884</td>
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<td>1,164</td>
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<td>11.33</td>
</tr>
<tr>
<td>Altinho</td>
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<td>699</td>
<td>1442</td>
<td>2337</td>
<td>6770</td>
<td>11.2</td>
</tr>
</tbody>
</table>

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