BACKGROUND

Following the magnitude 7.0 earthquake in Haiti on 12 January 2010, the Government of Haiti has led the emergency relief operation with support from the international community. The Post Disaster Needs Assessment (PDNA) process is led by the Government with technical support and facilitation provided by the United Nations (UN), the inter-American Development Bank (IDB), The World Bank (WB) and the European Commission (EC).

United Nations Institute for Training and Research (UNITAR) Operational Satellite Applications Programme (UNOSAT), the EC support of the PDNA providing remotely sensed (aerial and satellite) imagery. Field validation of remote sensing based damage analysis is being carried out (March – April 2010) in cooperation with Haiti's Centre National d'Information Geo-Spatiale (CNIGS).

METHODOLOGY

Over 300,000 individual buildings in eleven of the most earthquake-affected Communes of Haiti were evaluated for damages with post-earthquake aerial and satellite imagery. Of these, over 67,000 buildings were identified as having damages at the Grade 4 and 5 on the EMS-98 scale. These results are illustrated in the overview map at right (Map 1). The graduated green circles represent the relative total number of damaged buildings, per commune, per land use class.

Final Building Damage Analysis Summary by Commune and Landcover

Table 1: Damage analysis summary by communes and land cover classes

<table>
<thead>
<tr>
<th>Commune</th>
<th>Agricultural</th>
<th>Residential high density</th>
<th>Residential low density</th>
<th>Industrial</th>
<th>Downtown</th>
<th>Shanty</th>
<th>Commercial</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agri-densi</td>
<td>97</td>
<td>283</td>
<td>122</td>
<td>129</td>
<td>205</td>
<td>91</td>
<td>134</td>
<td>762</td>
</tr>
<tr>
<td>Oral-densi</td>
<td>56</td>
<td>128</td>
<td>108</td>
<td>39</td>
<td>109</td>
<td>69</td>
<td>111</td>
<td>581</td>
</tr>
<tr>
<td>Total</td>
<td>153</td>
<td>411</td>
<td>230</td>
<td>168</td>
<td>314</td>
<td>160</td>
<td>245</td>
<td>1343</td>
</tr>
</tbody>
</table>

RESULTS

Damage assessments of individual buildings have been conducted by comparing pre-earthquake satellite imagery to post-earthquake aerial photos.

Aerial photos were provided by the World Bank (World Bank ImageCat -RT Remote Sensing Mission), Google and NOAA. Satellite imagery from GeoEye and Digitalglobe.

Image analysis at UNOSAT/UNITAR, EC JRC and GEO CAN (Global Earth Observation – Catastrophe Assessment Network), have through manual photo-interpretation categorized buildings into destroyed, severely damaged, moderately damage and no visible damage according to the European Macroseismic Scale (EMS) definition (see building damage grades 1).

The damage to buildings and structures concerns damage that is visible from aerial and satellite imagery. Since such imagery generally provides an overview view, partial damage, and especially damage to the internal structures of buildings, is not detectable from the analysis. It is highly probable, that the damages currently identified in this assessment underestimate the actual building and infrastructure damages present on the ground.

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