GIS: Assessment Model and Evaluation of An Earthquake-stricken Area with A Case Study in Shangri-La

Shuangyun Peng¹, Kun Yang¹, Yanbo Cao²

¹ School of Tourism and Geographical Science, Yunnan Normal University, the 121 Street. 298 650092 Kunming, China
² Yunnan Earthquake Administration, Beichen Avenue. 41 650224 Kunming, China
daneall11@126.com

Abstract. It has a very important to assess the loss of earthquake-stricken area after the earthquake and the situation of absent on-site information. Due to the unique geology, geomorphology, building structural, social and economic situation in Yunnan, it makes the loss be different from other regions when the earthquake occurred. Based on the regional characteristics of Yunnan, this paper access the area of destroyed houses, economic loss, the number of earthquake death and homes lost by building earthquake death model, destroyed houses model, economic loss model and homes lost model. On this basis, we display the distribution pattern of the various losses on the map by integrating the evaluation model and GIS technology. The value of spatial distribution is more important than simple statistical data. Spatial distribution can help to understand the distribution of earthquake damage, provide technical support to make a targeted command decision.

Keywords: Seismic evaluation model, GIS, Shangri-La, Deqin

1 Introduction

Two large earthquakes took place in Shangri-La. They are M5.1, M5.9 level in at 4:44 on August 28, at 8:04 on August 31, 2013. Earthquake is located in the junction of Yunnan Diqing Tibetan Autonomous Prefecture, Deqin County, Ganzi Tibetan Autonomous Prefecture in Sichuan. Coordinates are latitude 28.22, longitude 99.35 and latitude 28.22, longitude 99.40. The impact district of the earthquake in Yunnan includes Shangri-La County and Deqin County, the specific location in map shown below:
Earthquake-stricken counties in 2012 two major domestic economic indicators are listed in Table 1.

**Table 1.** Economic conditions in the county in 2012 (million).

<table>
<thead>
<tr>
<th>Item</th>
<th>County</th>
<th>GDP</th>
<th>The first industrial output value</th>
<th>The second industrial output value</th>
<th>The third industrial output value</th>
<th>Government receipts</th>
<th>fiscal expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shangri-La</td>
<td>597557</td>
<td>33696</td>
<td>249998</td>
<td>313863</td>
<td>27488</td>
<td>234878</td>
</tr>
<tr>
<td></td>
<td>Deqin</td>
<td>144902</td>
<td>11886</td>
<td>70492</td>
<td>62524</td>
<td>10006</td>
<td>154898</td>
</tr>
</tbody>
</table>

3 Conclusion

The advantage of GIS is its ability to intuitively understand the spatial distribution of natural and socio-economic of areas. Earthquake damage assessment model can quickly evaluate housing losses and casualties based on historical data and the earthquake monitoring data. Integrating GIS and earthquake damage assessment model can master the spatial distribution of earthquake loss. This provides convenience for further emergency command. But, how to improve the prediction accuracy will is important things of future research.
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