GIS and Introduction of Seismic Assessment Procedures

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SUMMARY

The development of local spatial data infrastructure for municipalities has gained importance during last decade. This system can be considered as complex due to the nature of different institutional relationships. In many developing countries, like Turkey, municipalities mainly in urban areas are trying to introduce the geographical information systems (GIS).The use of digital databases, digital maps, satellite images are increasing rapidly with different purposes by different private and public institutions, municipalities and even within single departments operating on an individual basis.

Many national mapping agencies like in Turkey are not able to provide full and large-scale digital urban maps, while the absence or low quality of cadastral maps makes those basic core data unavailable or inaccessible or unusable. The result is that duplication and incompatible data are frequently observed and also benefactor-driven stand-alone projects have a limited impact through the lack of institutional embedding and are not able to mature from the project to the institutional level. Nevertheless, an increasing awareness and desire among data producers and consumers that investments in the development of digital data should be combined to reduce costs and increase benefits from especially GIS, and information technology (IT) as well.

Similar demand exists in Kadikoy Municipality, one of the largest districts of Istanbul in Anatolian side. A long-term vision is developed to make full use of IT and GIS to modernize all operations of the Municipality to increase the efficiency and effectiveness. A pilot study has been undertaken in an historical zone of Kadikoy called as Carsi (Bazaar) zone. This historical zone is decided to be revitalized in every terms. Deprivation of buildings, possible earthquake risk, loss of economic attractiveness of zone pushed the officials to take some precautions.

Before planning the activities, a detailed study about built environment was needed. By using GIS principles and existing GIS system of municipality, all buildings in the zone, 400 buildings, were assessed by structurally and during the site visits all necessary data were collected as well. During the study, as well as collecting spatial data about the buildings, seismic assessment study, a rapid visual assessment, has been completed. The results of this rapid visual survey, all data as all others saved and implemented in municipality GIS system.

The buildings were rated according to previously developed procedure and buildings were given a label like “more detailed seismic assessment is necessary” or not. This paper will focus on the development of the GIS for the purpose of seismic assessment in the case area. The components of the GIS database include structural information, spatial data about the buildings, seismic assessment study, rapid visual assessment. It is anticipated that the GIS database could be used by many parties involved in the process as a reference point in evaluating from the seismic views before planning or revitalization. Moreover, the results of the study may be used to push the owners of buildings to have detailed assessment if necessary, to strengthen or repair or rebuilt of the their property for the overall environmental safety.

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