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STATEMENTS OF ORIGINALITY

1. This study proposes spatial seismic assessment in Chiang Rai province by simulating earthquake scenarios. The study aims to understand the damage characteristic including properties and human losses. The results provided initial guidance for a preparedness plan against the future earthquake.

2. Generally, earthquake preparedness can be done under limited budget, time, and resources. The analysis contains multi-condition parameters such as an earthquake intensity, building risk and the importance of building. All the parameters are subjected to an amount of uncertainty. In addition, the conventional analysis performing individual unit of building is time consuming. This study hence adopted the Fuzzy Logic analysis and Artificial neural network method for the qualitative and quantitative data. The results show that the proposed approach is an efficient method for identifying critical building in the studied area and prioritizing their retrofit requirements.
3. Earthquake recovery plan in repairing the damaged buildings is a major task as soon as after the hit of a strong earthquake. However, with the limitations of building experts or engineers, equipment and budget, it is impossible to repair all buildings in the same time. Therefore, this research proposed a method to identify critical buildings and prioritize their repairing requirements. Due to the uncertain input, the analysis adopted the Fuzzy logic.

ข้อความแห่งการริเริ่ม

1) วิทยานิพนธ์นี้ได้นำเสนอการประเมินความเสียหายเชิงพื้นที่ในจังหวัดเชียงรายโดยจำลองสถานการณ์แผ่นดินไหว ทำให้ทราบลักษณะความเสียหายของเมืองทั้งชีวิตและทรัพย์สิน เพื่อเป็นแนวทางเริ่มต้นในการเตรียมพร้อมป้องกันภัยแผ่นดินไหวที่อาจเกิดขึ้นในอนาคต

2) โดยทั่วไปการเตรียมพร้อมรับมือภัยแผ่นดินไหวภายใต้งบประมาณ เวลา และทรัพยากรที่มีอย่างจำกัด จำเป็นที่จะต้องวิเคราะห์ข้อมูลภายใต้เงื่อนไขที่หลากหลาย เช่น ระดับความรุนแรงของแผ่นดินไหว ความเสี่ยงของอาคาร และความสำคัญของอาคาร ซึ่งเป็นข้อมูลที่มีความไม่แน่นอนอยู่ รวมทั้งการวิเคราะห์ด้วยวิธีโดยตรงที่วิเคราะห์อาคารแต่ละหลังจะใช้เวลานาน ดังนั้น งานศึกษานี้จึงนำวิธีการวิเคราะห์แบบฟัซซี่และโครงข่ายประสาทเทียม ในการวิเคราะห์ข้อมูลเชิงปริมาณและข้อมูลเชิงคุณภาพ ผลการศึกษาแสดงให้เห็นว่า วิธีการที่เสนอนี้เป็นวิธีการที่มีประสิทธิภาพทำให้ทราบอาคารที่มีความวิกฤตในพื้นที่ศึกษาที่ต้องพิจารณาเสริมกำลังก่อนหลังตามความจำเป็น

3) แผนการฟื้นฟูสภาพ โดยเฉพาะการซ่อมแซมอาคารเป็นสิ่งจำเป็นเร่งด่วนภายหลังเกิดแผ่นดินไหว แต่ภายใต้เงื่อนไขที่จำกัดทั้งวิศวกร เครื่องมือ และงบประมาณไม่สามารถดำเนินการได้พร้อมกันทุกอาคาร ดังนั้นงานวิจัยนี้จึงได้นำเสนอวิธีพิจารณาอาคารที่มีความวิกฤตเพื่อเลือกซ่อมแซมตามลำดับ เนื่องจากความไม่แน่นอนของข้อมูลเข้า การวิเคราะห์ได้ใช้วิธีฟัซซี่ลอจิก