SPATIAL ASSESSMENT OF SEISMIC VULNERABILITY IN INARUWA MUNICIPALITY

A THESIS
SUBMITTED TO CENTRAL DEPARTMENT OF GEOGRAPHY
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BY
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RECOMMENDATION LETTER

This is to certify that the thesis submitted by **Raju Rai** entitled **"Spatial Assessment of Seismic Vulnerability in Inaruwa Municipality"** has been prepared under my supervision in the partial fulfillment of the requirements for the degree of Master of Arts in Geography. I recommend this thesis to the evaluation committee for examination.

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Raju Rai
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ABBRAVIATION

Ad	Adobe
Bc	Brick in Cement
BCDP	Building Code Development Project
Bm	Brick in Mud
Cam	Campus
CBS	Central Bureau of Statistics
CGL	Steel
Cn	Concrete
Com	Commercial
DEPENET	Disaster Preparedness Network Nepal
DUDBC	Department of Urban Development and Building Construction
E	Epicenter
F	Focus
GIS	Geographical Information System
GPS	Global Positioning System
H	Hospital
HH	Households
HR	Hotel Restaurant
IM	Inaruwa Municipality
INGO	International Non Governmental Organization
IR	Irregular
ITC	International Institute of Geo-information Science and Earth Observation
JICA	Japan International Cooperation Agency
KIS	Key Informant Survey
MBT	Main Boundary Thrust
MCT	Main Central Thrust

MDR	Mean Damage Ratio
MMI	Modified Mercally Intensity
MuAN	Municipal Association of Nepal
NA	Not Available
NGO	Non Governmental Organization
NSET	National Society for Earthquake Technology
NSDRM	National Strategy for Disaster Risk Management
OI	Office Institute
Ps	Police Station
PESH	Potential Earth Science Hazard
PGA	Peak Ground Acceleration
PGD	Peak Ground Deformation
R1	Regular (ratio less than 1:3)
R2	Regular (ratio more than 1:3)
RADIUS	Risk Assessment tools for Diagnosis of Urban Areas against Seismic Disasters
RCC	Reinforced Cement Concrete
Res	Residential
RS	Remote Sensing
SA	Spectral Acceleration
Sch	School
SD	Spectral Displacement
Sh	Shrub
Th	Thatch
UNDP	United Nations Development Program
VDC	Village Development Committee
W	Wood

GLOSARRY

Seismic Waves: Vibrations that travel outward from the earthquake fault at speeds of several miles per second. Although fault slippage directly under a structure can cause considerable damage, the vibrations of seismic waves cause most of the destruction during earthquakes.

Intensity: The intensity is a number (written as a Roman numeral) describing the severity of an earthquake in terms of its effects on the earth's surface and on humans and their structures. There is much intensity for an earthquake, depending on where we are, unlike the magnitude, which is one number for each earthquake.

Magnitude: The amount of energy released during an earthquake a magnitude of 7.0 on the Richter scale indicates an extremely strong earthquake. Scientists assign a magnitude rating to earthquakes based on the strength and duration of their seismic waves. A quake measuring 3 to 5 would be considered minor or light; 5 to 7 is moderate; 7 to 8 is major, and 8 or more is great. Each whole number on the scale represents an increase of about 30 times more energy released than the previous whole number represents. Therefore, an earthquake measuring 6.0 is about 30 times more powerful than one measuring 5.0.

Vulnerability: Vulnerability is a set of conditions and process resulting from physical, social, economic and environmental factors which increase the susceptibility of a community to the impact of hazards, (UNDP, 2004). Positive factors that increase the ability of people and the society they live in to cope effectively with hazards that increase their resilience or reduce their susceptibility are considered as capacities.

Risk: Risk is the probability of harmful consequences or expected loss. Another definition of risk is the potential or likelihood of an emergency to occur. Risk results from the interaction between natural/ human induced conditions.

This can be calculated by the equation.

Risk= probability of hazard* vulnerability /capacity

Fault

The fracture across which displacement has occurred during an earthquake. The slippage may range from less than an inch to more than 10 yards in a severe earthquake.