



## ROAD MAP

## BACKGROUND

2017

- Start of the Project
- New seismometer installed at over 4,000 m
- Queen Mother graced the Salang Tendrel ceremony
- The 1<sup>st</sup> technical paper published
- The 2<sup>nd</sup> technical paper published

2018

- Home Minister observed full scale static test
- Shaking table in operation

2019

- Drone first flight and active faulting survey
- Held a scientific seminar in Thimphu

2020

- Install seismic intensity meters in gewogs
- Start using visual manuals for training programs
- Make seismic guideline, training on it
- Risk assessment in pilot sites

2021

- Building standard proposal
- Hazard map

2022

- End of the Project, shall achieve project purpose for developing Bhutanese agencies' capacity

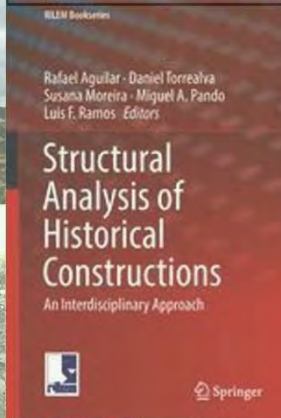
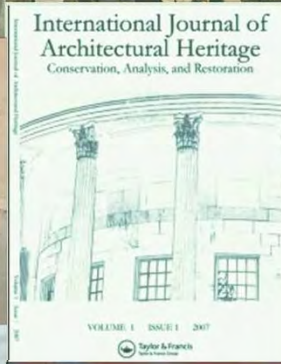
2023

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2027

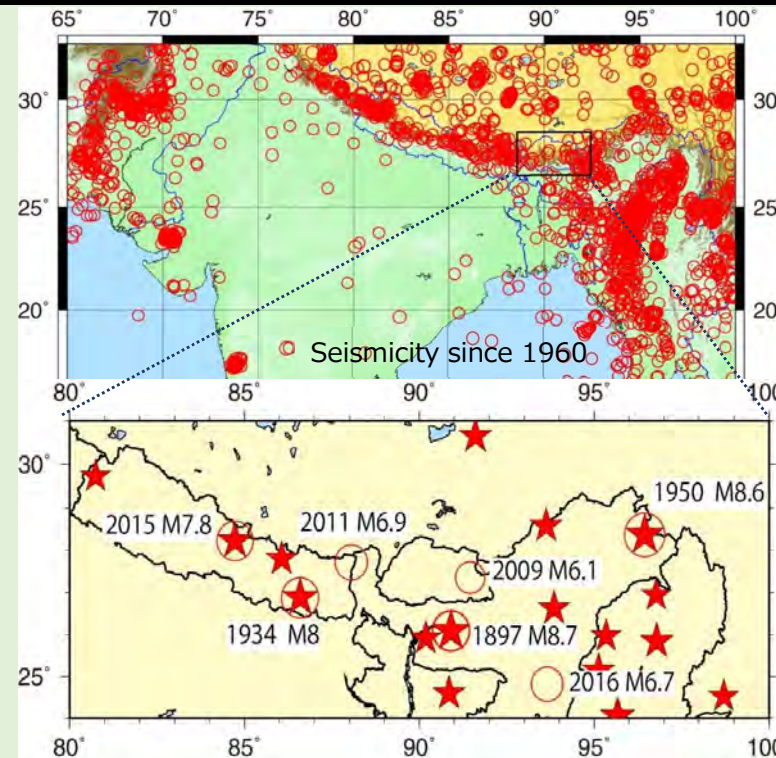


By 2027, shall achieve the overall goal to disseminate seismic technology for disaster mitigation of the composite masonry buildings across the country.



It is said 66 % of Bhutanese households live in traditional houses in rural area. Large earthquakes hit rural area in 2009 and 2011, which destroyed traditional houses. It is a critical task for the Royal Government of Bhutan (RGoB) to guide people to improve the seismic resilience of traditional houses. To this end, in collaboration with the Government of Japan, the SATREPS Project has been developing building seismic resilience technology and monitoring earthquakes.

## THREATS OF EARTHQUAKE



- ★ Earthquake more than M7 since end 19<sup>th</sup> century
- Earthquake damage to Bhutan





## Watch Earthquake to Understand it

## Make it Strong

## Let People Know it

**Output 1**  
To evaluate seismic risks of composite masonry buildings

Seismic Intensity

**Output 2**  
To develop seismic technology for constructing & strengthening composite masonry buildings

**Output 3**  
To enhance the dissemination mechanism for the seismic technology

Experience an earthquake  
Gain knowledge for disaster preparedness  
Place the equipment in place  
Experience an earthquake again with the equipment in place

SVR-1 (Beta Version)

The Manual for Construction of RAMMED EARTH

CONSTRUCTION SEMINAR 2018

### Implemented by

**Bhutan:** Department of Disaster Management, Department of Culture, Department of Geology and Mines, Department of Engineering Services

**Japan:** Nagoya City University, National Research Institute for Earth Science and Disaster Resilience, Kyoto University, Tohoku University, Kagawa University, Nihon University, Hiroshima University, Building Research Institute

### Funded by

