

## Earthquake Hazard Parameters

Scenario-based seismic hazard assessment involves development and analysis of earthquake scenarios to understand potential ground shaking and its impact on a specific region. This approach allows for systematic exploration of various seismic events, considering different magnitudes, focal mechanisms and rupture scenarios. By simulating these scenarios, one can evaluate the range of potential ground shaking intensities.

In West Rapti, three scenarios were chosen through team discussions, ranging from a worst-case to reasonable seismic events based on regional seismicity. An algorithm using local earthquake data guided the scenario selection for a comprehensive seismic hazard assessment.

### 1. Earthquake Scenario 1-NepalBiharEarthquake

Magnitude:8.2 Mw

Hypocenter: 82.67, 28.804

Depth: 15Km

Rupture Grid: 83.80699, 28.468137

81.913706, 28.11079

83.748553, 28.994897

81.855418, 28.636209

Rake:90 Degree

Dip:09 Degree

Strike: 315 Degree

- Scenario 1<sup>st</sup> encompasses the similar nature of Nepal Bihar Earthquake with epicentre at Rukum with Rupture of around 175km length and 60km width having 15km depth with 8.2 Mw Magnitude

### 2. Earthquake Scenario 2- Gorkha Earthquake

Magnitude:7.8 Mw

Hypocenter: 82.825, 28.598

Depth: 15Km

Rupture Grid: 81.995216, 28.46269

82.255438, 29.018822

83.813433, 28.639116

83.571518, 28.088997

Rake: 90 Degree

Dip: 09 Degree

Strike: 315 Degree

- Scenario 2<sup>nd</sup> encompasses the similar nature of Gorkha Earthquake with epicentre at around Rukum with rupture of around 160Km length and 70 km width having 15km depth with 7.8 Mw Magnitude

### 3. Earthquake Scenario 3-1501 Earthquake

Magnitude:8.6Mw

Hypocenter: 82.825, 28.598

Depth: 15Km

Rupture Grid:

82.22738                      29.10464

81.69072                      28.409729

83.814249                      27.625378

84.476504                      28.231228

Rake: 90 Degree

Dip: 09 Degree

Strike: 315 Degree

- Scenario 3rd simulates an event similar to the 1501 Earthquake With epicentre near Rukum with rupture of about 240 Km length and 90 Km width at 15Km depth with 8.6 Mw Magnitude