

Novel Perspectives of Engineering Research Vol. 2



B P International



Novel Perspectives of Engineering Research

Vol. 2

India ■ United Kingdom



B P International

Editor(s)

Dr. Giovanni Bucci

Professor,
Department of Industrial Engineering and Information and Economy
University of L'Aquila Italy.
Email: giovanni.bucci@univaq.it, bucci@ieee.org;

FIRST EDITION 2021

ISBN 978-93-5547-124-6 (Print)

ISBN 978-93-5547-132-1 (eBook)

DOI: 10.9734/bpi/nper/v2



Contents

Preface	i
Chapter 1 Seismic Hazard Assessment of Tribal District Headquarter Dantewara of Chhattisgarh State (India) Ashish Kumar Parashar	1-15
Chapter 2 Study on Application of Hardware Efficient CIC Compensation Filter in Narrow Band Filtering Vishal Awasthi and Krishna Raj	16-28
Chapter 3 Design and Implementation of an Optimal PV Solar Generator in Tropical Zone Andre Youmssi and Emmanuel Patrick Feudjio	29-46
Chapter 4 Hybrid Signed Digit Arithmetic in Efficient Computing: A Comparative Approach to Performance Assay Vishal Awasthi and Krishna Raj	47-58
Chapter 5 Study about Linen Fabric on the Surface Applied Natural Herbal Dyes to Improving the Colour Fastness and Absorbency Characteristic Properties Ramratan Guru, Rohit Kumar and Deepika Grewal	59-71
Chapter 6 Software Reusability Development through NFL Approach for Identifying Security Based Innerrelationships of Affecting Factors: A Recent Study T. Rajani Devi and B. Rama	72-85
Chapter 7 Water-Traps System in Rainwater Management and Implementation of Lock-Brick Systems Technology to Improve the Quality of Household Life Susilawati	86-95
Chapter 8 Implementation of an Efficient Scheme for Dynamic Channel Allocation Using Intelligent Agent in Mobile Communication Swati M. Khandare and R. R. Sedamkar	96-106
Chapter 9 Stabilization of Expansive Soil with Various Admixtures: A Brief Review K. Murali, S. Ashok, N. Giridharan, K. Kaniyan Pandiarasan and P. Logesh	107-111
Chapter 10 Study on Design and Implementation of E-Commerce Web Application V. Vinitha Stephe and M. Lakshmi	112-118
Chapter 11 On Artificial Neural Networks' Modelling of Non-Properly Prepared Teachers' Implication on Students' Academic Performance, Adopting Noisy Contaminated Optical Character Recognition (OCR) Hassan M. H. Mustafa and Mohamed I. A. Ibrahim	119-131

Seismic Hazard Assessment of Tribal District Headquarter Dantewara of Chhattisgarh State (India)

Ashish Kumar Parashar^{1*}

DOI: 10.9734/bpi/nper/v2/12447D

ABSTRACT

Tremors, the most precarious and catastrophic natural hazards in the globe, manifest themselves in the form of vibrations of the ground which are caused by the sudden release of strain that has accumulated over time. In recent years, there has been a rise in public awareness about earthquakes, their causes, and mitigations. The approach of quantifying the area in terms of topographical and seismological data is known as seismic hazard analysis. In the present chapter, an attempt has been made to estimate seismic hazard at bedrock level in terms of Peak Ground Acceleration (PGA) using state of art, deterministic and probabilistic seismic hazard analysis. A comprehensive catalogue of historical and recent seismicity, within 300 km radius around headquarter has been compiled and new seismic tectonic map has been engendered for the region. In the seismic tectonic map, 13 number of faults have been considered as major seismic sources around the district headquarter Dantewara. Before conducting a hazard analysis, make sure that the data is complete. Finally, earthquake data was statistically analysed, and the seismicity of the region around Dantewara, Chhattisgarh's district headquarters, was assessed by defining the 'a' and 'b' parameters of the Gutenberg- Richter recurrence relationship. Values of the PGA for M100 Earthquake have been estimated for the district headquarter Dantewara. Liner faults have been used to develop seismic hazard curve for study area. For peak ground acceleration value 0.05g the estimated return period is low on the other hand for higher PGA(g) value 0.10g the estimated return period is high for study area. The outcome of the research is clearly indicated that the maximum PGA values for the site of Dantewara, was obtained, due to fault No. 8.

Keywords: Linear sources; peninsular India; peak ground acceleration; return period; seismic hazard.

1. INTRODUCTION

After its declaration as new district of Chhattisgarh, the construction activities in Dantewara, have shortly increased. So, it is indispensable to pay attention towards shaky disaster and its mitigation. Tremors are common observable facts which occur most often irrespective of instance and place. The natural hazards strike abruptly without any prior warning and create damage to life and property. The behavior of earthquake is unpredictable; hence prior warning to public is not possible. Tremors are not killer by themselves but, houses in which people reside kill them. During an earthquake, inadequately designed and built houses on feeble foundation collapse and sometimes associated fire risks kill the residents as well. India is extremely susceptible to earthquakes, up to 60% of the land being prone to tremors of Richter Intensity 7.0 and greater, that can cause structural damage. Tremors persist to cause extensive human fatalities, the majority of which are due to the collapse of man-made structures. Recent tremors have revealed the under-preparedness of the country in facing its impacts. Since short- or mid-term prediction of earthquakes is not easy, seismic safety of built environments will ensure that, the structures do not collapse; this forms an important cornerstone of tremor disaster mitigation efforts.

Poor community in developing countries is mostly at risk to calamity because of the place where they live. Past study shows that, they are more likely to reside in risky locations, such as steep slopes,

¹Department of Civil Engineering SOS, Central University, GGV, Bilaspur, 495009, India.

*Corresponding author: E-mail: aparashar08@gmail.com;