



तकनीकी पत्रिका विषय-सूची

CURRENT CONTENT

(Technical Journals)
(A Monthly Current Awareness Service from Technical Journals)

Vol.07 No.03, March, 2023

The Central Library, IBM, Nagpur is subscribing the technical journals and also receiving them on complimentary basis on various subjects like Geology, Mining, Mineral Economics etc. These Technical Journals make up an important collection of latest scientific information. The library is rendering Reference Service to its users from these technical Journals (Article Indexing is one of them). Central Library, IBM provides Current Content Service from these technical journals in the name of "GEM" since 2006 on half yearly basis in print form. To expand this service to the IBM Offices all over India i.e. H.Q., Zonal & Regional Offices and to take a call of time, the Controller General, IBM desired to make this service online on monthly basis. The library staff made efforts to make it successful. This is the 3rd issue of Volume-7 for this service named "तकनीकी पत्रिका विषय — सूची" (Current Content- A Monthly Current Awareness Service from Technical Journals) Vol.07 No.03, March, 2023.

It will be highly appreciated if the valuable feedback is reciprocated. If some article as per content list is found to be of use by the reader the same may be requested and the library will send the scanned copy of the article to the interested reader.

Mrs R S Wakode
Assistant Library & Information Officer
library@ibm.gov.in
0712-2562847
Ext. 1210 , 1206

$\underline{I} \; \underline{N} \; \underline{D} \; \underline{E} \; \underline{X}$

<u>S.No</u>	<u>Title</u>	Page No
1)	Down to Earth	3-7
2)	Iron & Steel Review	8-11
3)	Journal of Mines Metals & Fuels	12-14
4)	Journal of the Geological Society of India	15-20
5)	Minerals & Metals Review	21-24

Down to Earth, Vol.31 No.17, 16-31 January 2023

Down To Earth

Founded in 1992 to arm you with knowledge critical to shaping a better world

FOUNDER EDITOR Anil Agarwal **EDITOR** Sunita Narain

MANAGING FOITOR Richard Mahapatra

CHIEF COPY EDITOR Snigdha Das ASSOCIATE EDITORS Aditya Misra, Rajit Sengupta

MULTIMEDIA EDITOR Arnab Pratim Dutta **CREATIVE DIRECTOR** Aiit Baiai

SUPPLEMENT EDITOR Souparno Baneriee

CHIEF CARTOONIST Sorit Gupto

REPORTING TEAM Shagun, Akshit Sangomla, Pulaha Roy, Taran Deol, Shuchita Jha, Rohini Krishnamurthy, Zumbish,

Seema Prasad, Himanshu N SUB EDITOR Dakshigni Palicha

WEB EDITORS Rajat Ghai, Preetha Banerjee, Nandita Banerji, Arya Rohini

DESIGN TEAM Chaitanya Chandan (Art Editor),

Sanjit Kumar (Deputy Art Editor), Ritika Bohra Yogendra Anand (Illustrators), Shri Krishan, Tarun Sehgal

PHOTO EDITOR Vikas Choudhary PHOTO LIBRARY Anil Kumar

PRODUCTION Rakesh Shrivastava, Gundhar Das TECH SUPPORT Raiendra Rawat, Jaidev Sharma MULTIMEDIA Joel Michael, Aishwarya Iyer, Sunny Gautam, Midhun Vijayan

INFORMATION AND RESEARCH SUPPORT

Kiran Pandey, Susan Chacko, Madhumita Paul, Sheeja Nair, Lalit Maurya, Dayanidhi Mishra

CONSULTING EDITORS Anumita Roychowdhury,

Vol 31, No 17; Total No of Pages: 60

Editorial, subscriptions and advertisements: Society for Environmental Communications 41, Tughlakabad Institutional Area, New Delhi 110 062,

Phone: 91-11-40616000, 29955124, 29956110,29956394,29956399 | Fax:91-11-29955879 Email:editor@downtoearth.org.in

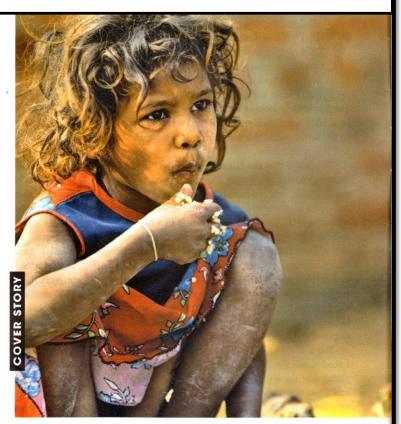
© 2023 Society for Environmental Communications. All rights reserved throughout the world. Reproduction in any manner is prohibited. Printed and published by Richard Mahapatra on behalf of Society for Environmental Communications. Printed at International Print-o-Pac Limited, B-204, 205, Okhla Industrial Area, Phase I, New Delhi-110020, India, and published at 41, Tughlakabad Institutional Area, New Delhi 110062.

To subscribe, sms 'dte Subscribe' to 56070 or visit www.downtoearth.org.in/subscribe

FOR ADVERTISEMENTS Jyoti Ghosh jghosh@cseindia.org

FOR SUBSCRIPTIONS KCRRaja,raja@cseindia.org

Down to Earth



Some 150 million people in the country remain excluded from the public distribution system even as the National Food Security Act enters its 10th year in 2023

- 1 Digest
 - Millet-based baby food to ensure complementary nutrition
- Joshimath subsidence The current disaster was cautioned against for decades
- Women in science What's impeding the closure of the gender diversity gap in STEM
- 20 Genetic engineering Countries mull over releasing GE trees in the wild
- 42 Factsheet Omicron dramatically reduces efficacy of COVID-19 vaccines
- 44 Patently Absurd Generic-drug makers collude with innovator firms in pay-for-delay pacts



Cover design: Ajit Bajaj Cover photo: Vikas Choudhary

Down To Earth does not endorse the content of advertisements printed in the magazine. All disputes are subject to the exclusive jurisdiction of competent courts and forums in Delhi/New Delhi only.

Down to Earth, Vol.31 No.17, 16-31 January 2023 ontents भारतीय खान ब्यूरो INDIAN BUREAU OF MINES SO WAR SUSS Demoiselle cranes' dietary detour to Rajasthan's केंद्रीय पुस्तकालग Khichan village ENTRAL Fearing a lifetime of distress, women are reluctant to marry into families in Maharashtra's water-scarce areas

- 48 Opinion
 Black soldier fly larvae is a cheaper, nutritious poultry feed
- 58 Civil Lines

 Has India managed to

 "eradicate" extreme poverty?

Down to Earth, Vol.31 No.18, 01-15 February 2023

Down to Earth

Founded in 1992 to arm you with knowledge critical to shaping a better world

FOUNDER EDITOR Anil Agarwal EDITOR Sunita Narain

MANAGING EDITOR Richard Mahapatra

CHIEF COPY EDITOR Snigdha Das

ASSOCIATE EDITORS Aditya Misra, Rajit Sengupta

MULTIMEDIA EDITOR Arnab Pratim Dutta

CREATIVE DIRECTOR Ajit Bajaj

SUPPLEMENT EDITOR Souparno Banerjee

CHIEF CARTOONIST Sorit Gupto

REPORTING TEAM Shagun, Akshit Sangomla, Pulaha Roy, Taran Deol, Shuchita Jha, Rohini Krishnamurthy, Zumbish, Seema Prasad, Himanshu N

SUB EDITOR Dakshiani Palicha

WEB EDITORS Rajat Ghai, Preetha Banerjee, Nandita Banerji, Arya Rohini

DESIGN TEAM Chaitanya Chandan (Art Editor), Ritika Bohra, Tarun Sehgal (Senior Designers), Yogendra Anand (Illustrator), Shri Krishan

PHOTO EDITOR Vikas Choudhary

PHOTO LIBRARY Anil Kumar

PRODUCTION Rakesh Shrivastava, Gundhar Das

TECH SUPPORT Rajendra Rawat, Jaidev Sharma

MULTIMEDIA Joel Michael, Aishwarya Iyer, Sunny Gautam, Midhun Vijayan

INFORMATION AND RESEARCH SUPPORT

Kiran Pandey, Susan Chacko, Madhumita Paul, Sheeja Nair, Lalit Maurya, Dayanidhi Mishra

CONSULTING EDITORS Anumita Roychowdhury, Vibha Varshney

Vol 31, No 18; Total No of Pages: 60

Editorial, subscriptions and advertisements: Society for Environmental Communications, 41.Tughlakabad Institutional Area, New Delhi 110 062,

Phone: 91-11-40616000, 29955124, 29956110, 29956394, 29956399 | Fax: 91-11-29955879. Email: editor@downtoearth.org.in

© 2023 Society for Environmental Communications. All rights reserved throughout the world. Reproduction in any manner is prohibited. Printed and published by Richard Mahapatra on behalf of Society for Environmental Communications. Printed at International Print-o-Pac Limited. 8-204. 205, Okhla Industrial Area, Phase I, New Delhi-1 10020, India, and published at 41, Tughlakabad Institutional Area, New Delhi 110 062.

To subscribe, sms'dte Subscribe'to 56070 or visit www.downtoearth.org.in/subscribe

FOR ADVERTISEMENTS Jyoti Ghosh

jghosh@cseindia.org

K C R Raja, raja@cseindia.org



⋖ Cover design: Ajit Bajaj

Down To Earth does not endorse the content of advertisements printed in the magazine. All disputes are subject to the exclusive jurisdiction of competent courts and forums in Delhi/New Delhi only.



06 Joshimath at risk

Excessive construction in a fragile terrain may have led to rapid subsidence in the Himalayan town

16 Clear connection

Data shows disasters on the rise in the Himalayan region in recent decades

20 Reckless planning

Rapid and unplanned urbanisation has made the ecologically sensitive mountain states more vulnerable

30 Desire for hydropower

Massive hydroelectric projects planned in seismically active areas of mountainous regions

38 Compound effect

A warming Himalayas and ecological degradation due to human actions make a deadly mix

48 Matter of survival

Sustainable strategies to ensure development of mountain states

EXPERT OPINION

Madhav Gadgil • C P Rajendran • Manoj Kumar and Raj Kiran Dhimar • Anil Joshi • Himanshu Kulkarni • Indra D Bhatt • P D Rai

Down to Earth, Vol.31 No.19, 16-28 February 2023

Down To Earth

Founded in 1992 to arm you with knowledge critical to shaping a better world

FOUNDER EDITOR Anil Agarwal

EDITOR Sunita Narain

MANAGING EDITOR Richard Mahapatra

CHIEF COPY EDITOR Snigdha Das

ASSOCIATE EDITORS Aditya Misra, Rajit Sengupta

MULTIMEDIA EDITOR Arnab Pratim Dutta

CREATIVE DIRECTOR Aiit Bajai

SUPPLEMENT EDITOR Souparno Banerjee

CHIEF CARTOONIST Sorit Gupto

REPORTING TEAM Shagun, Akshit Sangomla, Pulaha Roy, Taran Deol, Shuchita Jha, Rohini Krishnamurthy, Zumbish,

SUB EDITOR Dakshiani Palicha

WEB EDITORS Raigt Ghai. Preetha Baneriee. Nandita Banerji, Arya Rohini

DESIGN TEAM Chaitanya Chandan (Art Editor), Ritika Bohra, Tarun Sehgal (Senior Designers), Yogendra Anand (Illustrator), Shri Krishan

PHOTO EDITOR Vikas Choudhary

PHOTO LIBRARY Anil Kumar

PRODUCTION Rakesh Shrivastava, Gundhar Das

TECH SUPPORT Rajendra Rawat, Jaidev Sharma

MULTIMEDIA Joel Michael, Aishwarya Iyer, Sunny Gautam, Midhun Vijayan

INFORMATION AND RESEARCH SUPPORT

Kiran Pandey, Susan Chacko, Madhumita Paul, Sheeja Nair, Lalit Maurya, Dayanidhi Mishra

CONSULTING EDITORS Anumita Roychowdhury,

Vol 31, No 19; Total No of Pages: 60

Editorial, subscriptions and advertisements: Society for Environmental Communications, 41, Tughlakabad Institutional Area, New Delhi 110 062,

Phone:91-11-40616000,29955124, 29956110,29956394,29956399 | Fax:91-11-29955879. Email:editor@downtoearth.org.in

© 2023 Society for Environmental Communications. All rights reserved throughout the world. Reproduction in any manner is prohibited. Printed and published by Richard Mahapatra on behalf of Society for Environmental Communications. Printed at International Print-o-Pac Limited, B-204, 205, Okhla Industrial Area, Phase I, New Delhi-1 10020, India, and published at 41, Tughlakabad Institutional Area, New Delhi 110 062.

To subscribe, sms'dte Subscribe' to 56070 or visit www.downtoearth.org.in/subscribe

FOR ADVERTISEMENTS Jyoti Ghosh

FOR SUBSCRIPTIONS
KCR Raja, raja@cseindia.org



Race to decarbonise industries sees the US and EU shed their long-standing zeal for free trade and introduce protectionist policies at the cost of developing countries

4 Digest

Why the earthquake in Türkiye and Syria was so deadly

rural India has little to cheer for

- 16 Union Budget With allocation cuts in subsidies,
- 20 Jharkhand drought The state ill-prepared despite undertaking ample water works
- 24 New energy source Finland develops a battery using sand from construction sites
- Bid for bio-CNG All that ails production of this clec fuel in the country
- 41 Invasive species Planned seaweed park in Tamil Nadu poses threat to coral





Cover design: Ajit Bajaj Cover illustration: Yogendra Anand

Down To Earth does not endorse the content of advertisements printed in the magazine. All disputes are subject to the exclusive jurisdiction of competent courts and forums in Delhi/New Delhi only.



Iron & Steel Review, Vol.66 No.08, January 2023

Editor & Publisher: Santosh Mahanti

Directors:

Sabita Mahanti Abhishek Mahanti

Director & Content Strategist:

Editorial:

Megha Ghosh

Marketing:

Shyamalendu Banerjee Angan Chatterjee Sanjana Tiwari

Design & Layout:

Dipak Adhikari Sambaran Karmakar

Editorial & Corporate Office: Merlin Links, Block 5E/5F, 5th Floor 166B, S. P. Mukherjee Road Kolkata - 700 026

Phone: 91-6292241782/6292241783/ 033-2463 8088

Fax: 91-033-2465-3790 E-mail: contact@isrinfomedia.in Website: www.isrinfomedia.com

Registered Office: 10, Chowringhee Road Kolkata - 700 013

Subscription Rate

Domestic

Print Copy
₹ 12,000 (Yearly)

₹ 1,000 (Single Copy)

Digital Copy

₹ 8,500 (Yearly) Overseas

Print Copy

\$ 1,500 (Yearly)

€ 1,250 (Yearly)

Digital Copy \$ 800 (Yearly)

€ 500 (Yearly)

- Shipping Charge ₹ 1200 (Yearly)
- 5 % GST on advertisement as applicable

Owned & Printed by Santosh Mahanti at M/s. Kalpana Offset Private Limited 123, Tarak Pramanick Road, Kolkata 700 006

and published by him from 10, Chowringhee Road Kolkata - 700 013, India.

Reproduction of matter published here, in whole or in parts, is prohibited without written permission from the publisher.

The publisher and printer do not accept any responsibility for statements, data and opinions expressed by the author.



Cover Courtesy: **NMDC**

Articles/write-ups may be forwarded to: contact@isrinfomedia.in

Cover Story

16

NMDC - Mining a Better Future for India

"NMDC is well-placed to achieve the 67 MT production target by FY'25"



National Trends

24

SAIL and South Indian Bank Sign an MoU for Financing **Dealers**

Global Trends

34

Lucchini RS Group Orders a Forging Press from Danieli Breda

Company News

42

Shyam Metalics and Energy Limited to Complete its Third Acquisition

Focus

44

Indian Mining, Metals & **Cement Industries: Transition** to 2030 and Vision 2047

Market & Product

50

Best Practices for Maintenance of FRF in **Turbine EHC System**

Steel Market

52

Iron & Steel Performance for November 2022

Steel Market & **Performance**

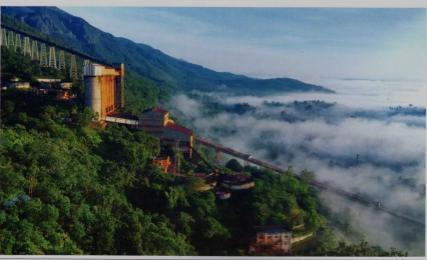
60

Performance of the Indian Steel Industry in April-December, 2022-23 -**Summary Highlights**

Steel Technology

62

The Improvement of Low **Temperature CVN Toughness** in Structural Pipes



Iron & Steel Review, Vol.66 No.08, January 2023



Refractory

76

Development of High Performance Castable and Suitable Design of Spout Area in Torpedo Ladle for Performance Enhancement

Post Show Report

92

Indo-German Business Forum – Strengthening Bilateral Relations in the Engineering Sector

Statistics

96

World Crude Steel Production – November 2022

Indian Steel Market & Prices – December 2022

Atomat Group . Champion Dealers (Mumbai) Pvt. Ltd. Creative Carbon Pvt. Ltd. D Danieli & C Spa .. Electrotherm (India) Limited Elektromag Devices Pvt. Ltd. Eastern Equipment & Engineers P. Ltd. H & K Rolling Mill Engineers Pvt. Ltd. Hi-Tech Chemicals (P) Ltd. Indiana Machine Tools Inductotherm (India) Pvt. Ltd. IFGL Refractories Limited ifm electronic India Private Limited JSW Steel Jindal Steel & Power K KOCKS .. Kailash Marketing Associates KELK ... M

A THE	A TOTAL S
ers' Index	
MOIL Limited	
Maithan Ceramic Limited	91
N	
	25
0	
Orind Special Refractories Pvt. Ltd	87
P P Rolling Mills MFG Co Pvt. Ltd	28-29, 47, 71
R	
Refratechnik Steel	75
R. Singh & Associates (P) Ltd	69
S	
SMS group	Second Cover
Steefo Industries Private Limited	8,9
schenck process	31
Shandong Mingren Heavy Machinery C	o., Ltd35
	14
T	
	7
Transformers & Rectifiers (India) Ltd	
TRL Krosaki Refractories Limited	
TVQ Coke Oven Consultants Private Lim	
Totale Global Pvt. Ltd	89
V	
YezzaniY	41
Yogi Ji Digi	Third Cover
Zumbach	51
Zincar Refractories Ltd	81

Iron & Steel Review, Vol.66 No.09, February 2023

Editor & Publisher

Santosh Mahanti

Directors:

Sabita Mahanti Abhishek Mahanti

Director & Content Strategist: Kritika Mahanti

Editorial:

Megha Ghosh

Marketing:

Shyamalendu Banerjee Angan Chatterjee Sanjana Tiwari

Design & Layout:

Dipak Adhikari Sambaran Karmakar

Editorial & Corporate Office:

Merlin Links, Block 5E/5F, 5th Floor 166B, S. P. Mukherjee Road Kolkata - 700 026

Phone: 91-6292241782/6292241783/

033-2463 8088 Fax: 91-033-2465-3790

E-mail: contact@isrinfomedia.in Website: www.isrinfomedia.com

Registered Office:

10, Chowringhee Road Kolkata - 700 013

Subscription Rate

Domestic

Print Copy

₹ 12,000 (Yearly) ₹ 1,000 (Single Copy)

Digital Copy

₹ 8,500 (Yearly)

Overseas

Print Copy

\$ 1,600 (Yearly) € 1,250 (Yearly)

Digital Copy

\$ 800 (Yearly)

- € 500 (Yearly)
- Shipping Charge ₹ 1200 (Yearly)
- 5 % GST on advertisement as applicable

Owned & Printed by Santosh Mahanti at M/s. Kalpana Offset Private Limited 123, Tarak Pramanick Road, Kolkata 700 006 and published by him from

10, Chowringhee Road Kolkata - 700 013, India.

Reproduction of matter published here, in whole or in parts, is prohibited without written permission from the publisher.

The publisher and printer do not accept any responsibility for statements, data and opinions expressed by the author.

Cover Story

18

REVIEW

Cover Courtesy:

Danieli Group

Articles/write-ups

may be forwarded to:

contact@isrinfomedia.in

"India's strong growth is confirmed by the increase in Danieli orders from major producers"

Special Feature

22

Steel Industry in 2021 and 2022

Interview

32

"Our team is set to revolutionise steel production"



Christian Geerkens Executive Project Director, SMS group

National Trends

34

SAIL Reports Q3 PAT at Rs. 463.54 Crores

Global Trends

42

Highbar Chooses SMS group for Rebar Minimill

Company News

54

Vesuvius Group to Invest Rs. 500 Crores for Expansion

Focus

58

Calculating Carbon Emission in Steel Industry: The Basic

Steel Market

64

Iron & Steel Performance for December 2022

Steel Market & Performance

73

Performance of the Indian Steel Industry in April-January, 2022-23 – Summary Highlights

Steel Technology

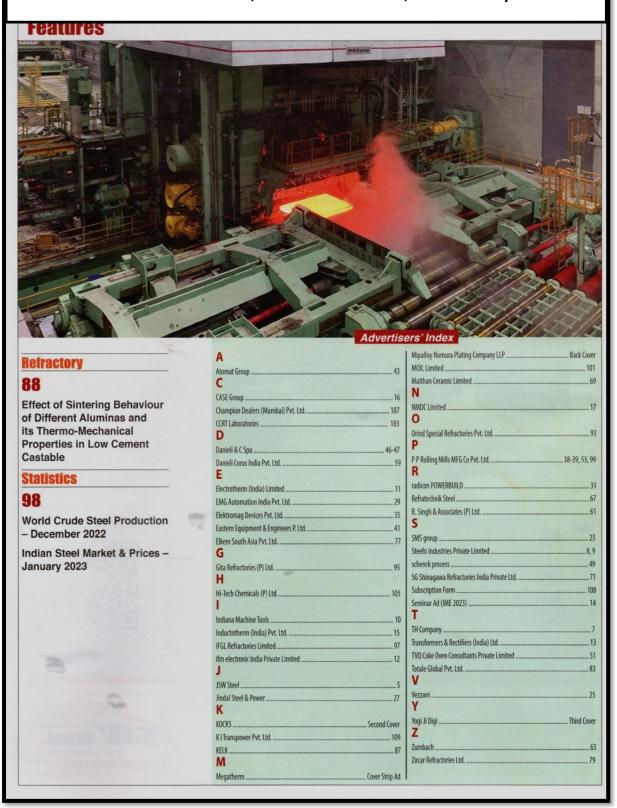
75

Danieli and Nucor Steel Gallatin Advance Activities for QSP® Plant



C

Iron & Steel Review, Vol.66 No.09, February 2023



Journal of Mines Metals & Fuels, Vol.70 No.07, July 2022

THE LONGEST SERVING TECHNICAL JOURNAL OF THE INDUSTRY, RESEARCH, ACADEMIA AND CONTROL OF THE INDUSTRY OF THE I BUSINESS OF ORES, MINERALS, FUELS, RENEWABLES AND AGGREGATE\$ CENTRAL (II ISSN 0022-2755)

(FOUNDED BY LATE P.K. MENON)

Managing Editor: Pradip Kumar Chanda Immediate Past Editor: Late Prof. A.K. Ghose, FNAE Honorary Editor in Chief. Prof. Dr. Jayanta Bhattacharya, IIT Kharagpur, India, FNAE

International Editorial Advisory Board

Dr. Abdolhadi Ghazvianin Fellow, ISRM, Tehran, Iran

Prof. Dr. Antonio V. Nieto, School of Mining Engineering, University of Witwatersrand, South Africa

Prof. Dr. Arif Jamal, Mining Engg., IIT (BHU),

Prof. Dr. Ashis Bhattacherjee, Mining Engineering, IIT, Kharagpur, India

Prof. Barun Kumar Nandi, Fuel & Mineral Engg, IIT/ISM, Dhanbad, India

Prof. Dr. Biswajit Samanta, Mining Engineering, IIT,

Prof. Dr. B S Sastry, Mining Engineering, IIT Kharagpur India

Prof. Dr. Edy Tonnizam Mohamad Geotropik, University Teknologi Malaysia

Dr. Keka Ojha, Petroleum Engg, IIT/ISM, Dhanbad,

Dr. Manis Kumar Jha, CSIR-National Metallurgical Laboratory, Jamshedpur, India

Prof. Michael Tuck, Mining Engineering. Federation

Prof. Dr. Mitchel W. Hitch, Mining Engineering, Tallinn University of Technology, Estonia

Prof. Dr. Mohan Yellishetty, Resources Engineering, Monash University, Australia

Niraj Ranjan Sharma, Metals & Mining Industry, IBM Singapore

Dr. Prabhat Kumar Mandal, CSIR-CIMFR, Dhanbad,

Dr. Pramod Paliwal, Fellow-CIM, Professor & Dean at School of Petroleum Management, Pandit Deendayal Petroleum University (PDPU), India.

Prof. Dr. Ram Bhattacharya, Mining Engg, IIT/ISM,

Dr. R.M. Bhatawdekar, Training & Courses, Geotroik, Universiti Teklogi, Malasiya

Dr. Robert Hall, HOD, Mining Engineering & Management, South Dakota School of Mines Dr. S.B. Srivastav, Geophysics, IIT/ISM, Dhanbad,

Sarma Pisupati, Professor of Energy and Mineral Engineering, Chemical Engineering and Director, Center for Critical Minerals, State College-DuBois

Area, USA

Prof. Subodh Kumar Maiti, Environmental Science & Engineering, IIT(ISM), Dhanbad, India

Prof. Supraksh Gupta, Mining Engg, IIT (BHU),

Dr. Tanmoy Maity, Power Electronics & Drives, IIT/ ISM, Dhanbad, India

Dr. Vasyl Lozynski, Dnipro University of Technology, Ukraine

Dr. Victoria R. Nalule, Petroleum Engg, University of

Vol.70, No.7, JULY 2022

THE CONTENTS

Discussion-Opinion-Editorial: Why to Leave or Stay in a Mining Job? Knowing and Appreciating it is Key to Retain Talents 336

by Jayanta Bhattacharya

 $Opportunity^{TM}$: The Coming Age of Business Engineers in the SMOG and MOGI Industries

339 by Jayanta Bhattacharya

Reliability Analysis of Dragline Subsystem using Bayesian Network Approach

by Deepak Kumar, Debasis Jana, Pawan Kumar Yadav and 341 Suprakash Gupta

Comparative Evaluation of the Damping Capacity of As-cast and t6 Temper a 356-sic AMMCS

by T. G. Rajiv, T. V. Sreerama Reddy and R. Chandrashekar 354

Effect of Al₂O₃ and CeO₂ Nano-Additives on Performance and Emission Characteristics of Diesel Engine Fueled with Neem Oil-Biodiesel

by R. Manjunatha, H. V. Byregowda and G. Panduranga Murthy Study on Partial Replacement of Silica Sand with Alternatives and its

Effect on Sand Mould and Casting Properties 367 by Prasad Raikar and Prashant P. Revankar

Influence of Alloying Element and Ageing on Microstructure and Dry Sliding Wear Behaviour of Cu-Zn-xNi Alloy

by A. N. Santhosh1, S. Aprameyan, Suresh Erannagari and Vasantha Kumar

Publishers:

BOOKS & JOURNALS PRIVATE LTD Moon Plaza, 2A, 2nd Floor, Taltala Kolkata 700 013, India

E-mails: bnjournals@gmail.com / pradipchanda@yahoo.co.uk www.jmmf.info / www.ijprvd.info

Co-Publishers? Informatics Publishing Company No.194 R.V. Road, Basavanagudi

Bengaluru 56004, India Emai: info@informaticspublishing.in

361

377

+91 8479919829 +91 9903463829 (Office) E-mail: bnjournals@gmail.com pradipchanda@yahoo.co.uk web: www.jmmf.info Registered Office: Books & Journals Pvt. Ltd. 62 Lenin Sarani, Kolkata 700 013

Editorial & Business Offices:

Moon Plaza, 2A, 2nd Floor

62 Lenin Sarani, Taltala

Kolkata 700 013

Mobiles:

+91 9239384829 /

Journal of Mines Metals & Fuels, Vol.70 No.08, August 2022

THE LONGEST SERVING TECHNICAL JOURNAL OF THE INDUSTRY, RESEARCH, ACADEMIA AND GRESS OF ORES, MINERALS, FUELS, RENEWABLES AND AGGREGATES
(II ISSN 0022-2755)

(FOUNDED BY LATE P.K. MENON)

Managing Editor: Pradip Kumar Chanda Immediate Past Editor: Late Prof. A.K. Ghose, FNAE Honorary Editor in Chief: Prof. Dr. Jayanta Bhattacharya, IIT Kharagpur, India, FNAE

International Editorial Advisory Board

Dr. Abdolhadi Ghazvianin Fellow, ISRM, Tehran, Iran

Prof. Dr. Antonio V. Nieto, School of Mining Engineering, University of Witwatersrand, South Africa

Prof. Dr. Arif Jamal, Mining Engg., IIT (BHU), Varanasi, India

Prof. Dr. Ashis Bhattacherjee, Mining Engineering, IIT, Kharagpur, India

Prof. Barun Kumar Nandi, Fuel & Mineral Engg, IIT/ISM, Dhanbad, India

Prof. Dr. Biswajit Samanta, Mining Engineering, IIT, Kharagpur, India

Prof. Dr. B S Sastry, Mining Engineering, IIT Kharagpur India

Prof. Dr. Edy Tonnizam Mohamad Geotropik, University Teknologi Malaysia

Dr. Keka Ojha, Petroleum Engg, IIT/ISM, Dhanbad, India

Dr. Manis Kumar Jha, CSIR-National Metallurgical Laboratory, Jamshedpur, India

Prof. Michael Tuck, Mining Engineering. Federation University, Australia

Prof. Dr. Mitchel W. Hitch, Mining Engineering, Tallinn University of Technology, Estonia

Prof. Dr. Mohan Yellishetty, Resources Engineering, Monash University, Australia Dr. Prabhat Kumar Mandal, CSIR-CIMFR, Dhanbad,

Dr. Pramod Paliwal, Fellow-CIM, Professor & Dean at School of Petroleum Management, Pandit

Deendayal Petroleum University (PDPU), India. Prof. Dr. Ram Bhattacharya, Mining Engg, IIT/ISM, Dhanbad, India

Dr. R.M. Bhatawdekar, Training & Courses, Geotroik Universiti Teklogi, Malasiya

Dr. Robert Hall, HOD, Mining Engineering & Management, South Dakota School of Mines

Dr. S.B. Srivastav, Geophysics, IIT/ISM, Dhanbad, India

Sarma Pisupati, Professor of Energy and Mineral Engineering, Chemical Engineering and Director, Center for Critical Minerals, State College-DuBois Area, USA

Prof. Subodh Kumar Maiti, Environmental Science & Engineering, IIT(ISM), Dhanbad, India

Prof. Supraksh Gupta, Mining Engg, IIT (BHU), Varanasi, India

Dr. Tanmoy Maity, Power Electronics & Drives, IIT/ISM, Dhanbad, India

Dr. Vasyl Lozynski, Dnipro University of Technology, Ukraine

Dr. Victoria R. Nalule, Petroleum Engg, University of Dundee, UK

70
YEARS IN
PUBLICATION
1953-2022

Vol.70, No.8, AUGUST 2022

THE CONTENTS

Discussion-Opinion-Editorial: Will Pandemic and Inflation Upend Transition from Oil and Gas Economy to Electric Vehicle and Hydrogen Economy to Net Zero Economy?

by Jayanta Bhattacharya

393

CultureTM: Preparing Employees for the Responsibility: A Cultural Deficit in the SAM and MOGI Companies

by Jayanta Bhattacharya

396

Having a Profit Center of Fuel and Mineral Trading is Already Essential for the Mining
Companies and the Skillsets they Need
by Jayanta Bhattacharya 399

Slope Monitoring and Failure Prediction Techniques in Mines: A Review

by Mohd. Maneeb Masood, Gunda Yuga Raju and Tarun Verma 410

A Network Flow Model for Operational Planning in an Underground Gold Mine

By Suliman Emdini Gliwan and Kevin Crowe 418

Surface Excavation Assessment in Non-bedded Rock Mass Based on Borehole Information and Seismic Survey

by Azhar Abd Manan, Edy Tonnizam Mohamad, Rosli Saad, Eka Kusmawati Suparmanto, Mariatul Kiftiah Ahmad Legiman and Fazleen Slamat 427

Characteristics of Various Losses of Axial Piston Pump and Bent Axis

Hydro-motor with respect to Displacement Conditions and Load Demands

by Ajit Kumar Pandey, Amit Kumar and Ajit Kumar

438

Saving of Coke Oven Gas by Reduction of Smoke Pushing of Recovery Type Coke Plant

by Niranjan Mahato, Himanshu Agarwal and Jainendra Jain

Editorial & Business Offices:

Moon Plaza, 2A, 2nd Floor
62 Lenin Sarani, Taltala
Kolkata 700 013
Mobiles:
+91 9239384829 /
+91 8479919829
+91 9903463829 (Office)
E-mail: bnjournals@gmail.com
pradipchanda@yahoo.co.uk
web: www.immf.info

Registered Office: Books & Journals Pvt. Ltd. 62 Lenin Sarani, Kolkata 700 013 Publishers:

447

BOOKS & JOURNALS PRIVATE LTD Moon Plaza, 2A, 2nd Floor, Taltala Kolkata 700 013, India

E-mails: bnjournals@gmail.com / pradipchanda@yahoo.co.uk www.jmmf.info / www.ijprvd.info

Co-Publishers:
Informatics Publishing Company
No.194 R.V. Road, Basavanagudi
Bengaluru 56004, India
Emai: info@informaticspublishing.in

Journal of Mines Metals & Fuels, Vol.70 No.09, September 2022

THE LONGEST SERVING TECHNICAL JOURNAL OF THE INDUSTRY, RESEARCH, ACADEMIA AND BUSINESS OF ORES, MINERALS, FUELS, RENEWABLES AND AGGREGATES CENTRAL

(II ISSN 0022-2755)

(FOUNDED BY LATE P.K. MENON)

Managing Editor: Pradip Kumar Chanda

Immediate Past Editor: Late Prof. A.K. Ghose, FNAE Honorary Editor in Chief.

Prof. Dr. Jayanta Bhattacharya, IIT Kharagpur, India, FNAE

International Editorial Advisory Board

Dr. Abdolhadi Ghazvianin Fellow, ISRM, Tehran, Iran

Prof. Dr. Antonio V. Nieto, School of Mining Engineering, University of Witwatersrand,

Prof. Dr. Arif Jamal, Mining Engg., IIT (BHU), Varanasi, India

Prof. Dr. Ashis Bhattacherjee, Mining Engineering, IIT, Kharagpur, India

Prof. Barun Kumar Nandi, Fuel & Mineral Engg, IIT/ISM, Dhanbad, India

Prof. Dr. Biswajit Samanta, Mining Engineering, IIT,

Prof. Dr. B S Sastry, Mining Engineering, IIT Kharagpur India

Prof. Dr. Edy Tonnizam Mohamad Geotropik, University Teknologi Malaysia

Dr. Keka Ojha, Petroleum Engg, IIT/ISM, Dhanbad,

Dr. Manis Kumar Jha, CSIR-National Metallurgical Laboratory, Jamshedpur, India Prof. Michael Tuck, Mining Engineering. Federation

University, Australia

Prof. Dr. Mitchel W. Hitch, Mining Engineering, Tallinn University of Technology, Estonia Prof. Dr. Mohan Yellishetty, Resources Engineering,

Monash University, Australia Dr. Prabhat Kumar Mandal, CSIR-CIMFR, Dhanbad,

Dr. Pramod Paliwal, Fellow-CIM, Professor & Dean at School of Petroleum Management, Pandit Deendayal Petroleum University (PDPU), India.

Prof. Dr. Ram Bhattacharya, Mining Engg, IIT/ISM,

Dr. R.M. Bhatawdekar, Training & Courses, Geotroik, Universiti Teklogi, Malasiya

Dr. Robert Hall, HOD, Mining Engineering & Management, South Dakota School of Min

Dr. S.B. Srivastav, Geophysics, IIT/ISM, Dhanbad,

Sarma Pisupati, Professor of Energy and Mineral Engineering, Chemical Engineering and Director, Center for Critical Minerals, State College-DuBois Area, USA

Prof. Subodh Kumar Maiti, Environmental Science & Engineering, IIT(ISM), Dhanbad, India

Prof. Supraksh Gupta, Mining Engg, IIT (BHU), Varanasi, India

Dr. Tanmoy Maity, Power Electronics & Drives, IIT/ ISM, Dhanbad, India

Dr. Vasyl Lozynski, Dnipro University of

Dr. Victoria R. Nalule, Petroleum Engg, University of Dundee, UK

70

Vol.70, No.9, SEPTEMBER 2022

THE CONTENTS

Discussion-Opinion-Editorial: Will Pandemic and Inflation Upend Transition from Oil and Gas Economy to Electric Vehicle and Hydrogen Economy to Net Zero Economy? by Jayanta Bhattacharya 457 CultureTM: Preparing Employees for the Responsibility: A Cultural Deficit in the SAM and MOGI Companies by Jayanta Bhattacharya 462 Effects of Blast Design to the Environment in Limestone Quarry by Haizam Hamidun and Edy Tonnizam Mohamad 466 Breakdown and Productivity Prediction of Dragline using Machine Learning Algorithms by Vikram Seervi, Nilesh Pratap Singh, Nawal Kishore and Rajeev Verma 475 Analysis of Surface Subsidence and Relative Movements of Underground Rock Strata over an Inclined Longwall Panel by S.V.S.S. Ramalingeswarudu, Ramesh Dundra, V.R. Sastry and Ch. S.N. Murty 483 Design and Development of Outdoor Air Purifier for Automotive Emission Powered by Solar and Wind Energy by Girish V. Kulkarni, B. P. Harichandra, N. Jegadeeswaran, A. S. Divakara Shetty and H. S. Balasubramanya 491 V-Type Firing Pattern in Blasting: Evidence to Substantiate the Improved

by Lalit Singh Chouhan, Avtar K. Raina and V.M.S.R. Murthy

Editorial & Business Offices: Moon Plaza, 2A, 2nd Floor 62 Lenin Sarani, Taltala Kolkata 700 013 Mohiles +91 9239384829 / +91 8479919829 +91 9903463829 (Office) E-mail: bnjournals@gmail.com pradipchanda@yahoo.co.uk

Fragmentation

Registered Office: Books & Journals Pvt. Ltd. 62 Lenin Sarani, Kolkata 700 013

web: www.jmmf.info

Publishers:

497

BOOKS & JOURNALS PRIVATE LTD Moon Plaza, 2A, 2nd Floor, Taltala Kolkata 700 013, India E-mails: bnjournals@gmail.com / pradipchanda@yahoo.co.uk www.jmmf.info / www.ijprvd.info

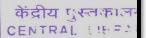
Co-Publishers:

Informatics Publishing Company No.194 R.V. Road, Basavanagudi Bengaluru 56004, India Emai: info@informaticspublishing.in

Journal of the Geological Society of India, Vol.99 No.01, January 2023

JUUKNAL

of



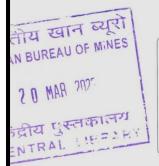
THE GEOLOGICAL SOCIETY OF INDIA

(Abstracted/Indexed in AGI's Bibliography and Index of Geology, Chemical Abstracts, Current Contents, GEOBASE, GEoRef, Mineralogical Abstracts, GeoArchive, Thomson ISI database (SCIE, CC/PC & ES))

JANUARY 2023	N
CONTENTS	
CONTENTS	
Groundwater Sustainability, Security and Equity: India Today and Tomorrow. SUBHAIYOTI DAS	
RESEARCH ARTICLES	
Telt Enhanced Deformation in Migmatites of Higher Himalayan Crystallines (HHC), India. Sandeep Singh and Aman Kushwaha	
old-Sulfide Mineralization in Banded Iron Formation at Girar, Bundelkhand Craton, India: Inferences from Field Observations and Petrography.	
AJIT KUMAR SAHOOA, RAJAGOPAL KRISHNAMURTHIB, GAUTAM KUMAR DINKARC, N.V. CHALAPATHI RAOA, ARUN KUMAR OJHAD, SNEHA RAGHUVANSHIA and SUDIPA BHUNIA	
etrologic Evolution of Post-collisional Magmas of Spinel-Iherzolite Subcontinental Mantle Contaminated by Continental Crust; Palandöken (Erzurum) Volcanic Rocks in the East Anatolia, Turkey. S. Kürüm, A. Sar and N. Nas	
ssessment of Metal Pollution of Overburden in a Tropical Coalfield, Ib valley, India: A Case Study. Bishnu Prasad Sahoo, Himanshu Bhushan Sahu, Vishnu Vardhan Kanuri, Mrinal Kanti Biswas and Ajit Kumar Vidyarthi	
orehole Log Reconstruction using ANN: A Case Study from KBH-08, Koyna-Warna Region. D. Haritha and N. Satyavani	
ffect of Geological, Mineralogical Characteristics on Grindability of Bauxite: A Case Study of Indian Lateritic Bauxite Deposits. P.G. Bhukte, G.T. Daware, S.P. Masurkar, M.S. Panchal and M.J. Chaddha	
he Star-shaped Resting Traces Asteriacites lumbricalis from Thaiat Member (Early Jurassic -Bajocian) of Lathi Formation of the Jaisalmer Basin, Western India. V.S. Parihar, V.K. Meghwal and Abhimanyu Singh	
ossil Mahogany from the Early Paleogene of India. Kajal Chandra, Anumeha Shukla, R.C. Mehrotra, Mahi Bansal and Vandana Prasad	
etrography of the Bajocian Sandstone of Joyan Member, Jaisalmer Basin, Western Rajasthan: Implications for Provenance and Basin Evolution. Aashna Javed, K.F. Khan and M.A. Quasim	
rioritization by Innovative Approach for Implementation of Groundwater Management Strategies. Sanju R. Phulpagar and Ganesh D. Kale	
vestigation on Barail Formation Coals of Upper Assam with Reference of Coal Bed Methane (CBM). Prasun Banik, Ranjan Phukan, Ranjan Kumar Sarmah and Minati Das	

Journal of the Geological Society of India, Vol.99 No.01, January 2023

Well Hydraulics in Parts of Western Vidarbha Region in Deccan Traps, India.	
CHETAN MISHRA, SUNIL TOPPO, PRADEEP K. NAIK, H.P. SINGH and AMIT RAJ	105
Assessment of Bi-Decadal Groundwater Fluctuations in a Coastal Region Using Innovative Trends and Singular Spectrum Analysis. Chythanya Krishnan and Amai Mahesha	111
CHYTHANYA KRISHNAN AND AMAI MAHESHA	111
Impact of Leachate Percolation on Groundwater Quality near the Bandhwari Landfill Site Gurugram, India. Sudhir K. Srivastava, Syed K. Mohiddin, Dhan Prakash, Sanjay G. Bhartariya, Tejdeep Singh, Anoop Nagar, Kiran Lale and Keisham Radhapyari	120
Geospatial Data Analysis Using Fuzzy Analytical Hierarchy Process to Delineate Groundwater Potential Zone in a Semi-arid Hard Rock Terrain.	
RAJARSHI SAHA, TUSHAR WANKHEDE, ISWAR CHANDRA DAS, VINOD KUMAR KUMARANCHAT AND K. SATYANARAYANA REDDY	129
BOOK REVIEW	
Review of EARFAM – An Annual Publication of AMDER: Special Volume on Exploration and Ore Geology. Reviewed by T.M. Mahadevan	139
NEWS AND NOTES	
A Pilot Assessment of the Fatal Landslide on 29 August 2022 in Kudayathoor, Idduki, Kerala. K. Amal George, P.S. Sunil, A.U. Anish, Girish Gopinath and V.K. Mini	141
Fluoride in Pleistocene Barind Terrace of South Dinajpur, West Bengal: Scope for Nano-Remediation. Susnata Ray, Goutam Paul and Sharadindra Chakrabarti	145
Post-seismic Landslide Evolution in Tectonically Active Terrains,	
YUNUS ALI PULI PADAN	148



The Geological Society of India wishes all its readers a very Happy New Year – 2023

Cover

Left: Generalized geological map of India showing distribution of major cratons and other geological domains (modified after Ramakrishnan and Vaidyanadhan, 2008). Budelkhand Craton (Bu) is marked within a rectangular box Right: Simplified geological map of Bundelkhand Craton (modified after Slabunov and Singh, 2019). (for details see pages 13-22)

ADDRESS OF EDITOR

All papers intended for publication and also related correspondence should be addressed to:

B. Mahabaleswar, Editor, Geological Society of India, No.30 & 31, B.P. Radhakrishna Bhavan,

1st Main, 3rd Cross, Byrappa Garden, Kathriguppe, BSK 3rd Stage, Bengaluru - 560 085, India.

Email: editorjournalgsi@gmail.com; Editor_JGSI@geosocindia.org; Mobile: 09341264052;

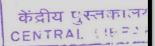
Telephone: 080-2672 3943; 6360157889; Website: http://www.geosocindia.org.

2

Journal of the Geological Society of India, Vol.99 No.02, February 2023

JOURNAL

of



THE GEOLOGICAL SOCIETY OF INDIA

(Abstracted/Indexed in AGI's Bibliography and Index of Geology, Chemical Abstracts, Current Contents, GEOBASE, GEORef, Mineralogical Abstracts, GeoArchive, Thomson ISI database (SCIE, CC/PC & ES))

Vol. 99 **FEBRUARY 2023** No. 2 CONTENTS **EDITORIAL** Earth Science Education at a Crossroad - Headed Toward an Irreversible Decline or Paving the Way to a Sustainable Future? COURTNEY JERMYN, VICTORIA CORCIMARU AND EDUARDO DE MULDER RESEARCH ARTICLES Investigation of Tombinoutek Landslide, Old Cachhar Road, Manipur, India. H.S. RAJKUMAR, S.S. HEISNAM, J.S. KONGBRAILATPAM AND O. MOIRANGTHEM 156 Arsenic and Boron in Felsic Rocks: A Review. Frontal Changes of Gangotri Glacier, Garhwal Himalaya, between 1935 and 2022. RAKESH BHAMBRI, KALACHAND SAIN, PRITAM CHAND, DEEPAK SRIVASTAVA, SAMEER K. TIWARI AND JAIRAM SINGH YADAV Avalanche Hazards Around Kedarnath Temple, Mandakini River Valley, Uttarakhand - A Case Study. KALACHAND SAIN, MANISH MEHTA and VINIT KUMAR 173 Absence of Belemnites in the Post-Cenomanian Marine Successions of Cauvery Basin, India: Role of Sea Level, Paleogeography, and Belemnite Paleoecology. SUBHRONIL MONDAL, SHREYASI HAZRA and NIVEDITA CHAKRABORTY 177 Unravelling Source Area Composition for the Paleoproterozoic Basal Conglomerate (Vindhyan Supergroup) around Dalla, Sonbhadra District, Central India. ANKITA A. SINGH, B. P. SINGH, D. PRAKASH and C. K. SINGH 187 Evolution and Evaluation of Coal-bed Methane in Cambay Basin, Western India: Insights from Stable Isotopic and Molecular Composition. SANJAY OJHA, NARESH K. PUNJRATH, AMITAVA CHAKRABORTY and PRAKASH K. SINGH 193 Land Use Land Cover (LULC) and Surface Water Quality Assessment in and Around Selected Dams of Jharkhand using Water Quality Index (WQI) and Geographic Information System (GIS). SOUMYA PANDEY, NEETA KUMARI and SHAH AL NAWAJISH 205 Impact of Aquifer Sediments - Minerals - Groundwater Interaction on Hydrochemistry, Aligarh District, SARFARAZ AHMAD, M RIBIE BIN ARIF, MOHD UVAISH ANSARI, SHARIB ISLAM AND SYED GHUFRAN ALI 219 Exploring Geomorphic Features in Lower Sabarmati River Basin as Signatures of Palaeoenvironmental Change, Gujarat: A Remote Sensing Approach. Nikul P. Desai, Shital H. Shukla and Aashna Tandon

Journal of the Geological Society of India, Vol.99 No.02, February 2023

Delineation of Paleoc	hannel and Groundwater Resources in the Khari River Basin, Kachchh using	
Transient Electron RAKESH NIKAM, G.	magnetics. Pavan Kumar, A. Durga Prasad, Himanshu Chaube and Sumer Chopra	239
Dynamics of Meander	r Geometry and Formation of Neck Cutoff of River Raidak-I within Himalayan	207
Foreland Basin, In	ndia. ASANTA MANDAL and BISWAJIT BERA	247
V 3	elsic Volcanic Rocks around Mundiyawas-Khera Copper Deposit, Alwar Basin, North	247
Delhi Fold Belt, W		259
Late Holocene Sedime	entary Record from Chhari Dhandh, Kachchh, Western India. INGH AASHNA TANDON and N. Y. BHATT	268
Case Study in Bail	relation for the Hypsometric Integral to Differentiate Geology and Neotectonics: A longjiang Drainage Basin (Eastern Tibet Plateau) .	273
RAVI, H.R., SAJAN,	on Concentration in Groundwater of Areekode Region, Kerala, India - A Case Study. C.P., Prasad N. Bapat, Madhukumar, D.M., Wadie Ahmed Mokbel Ghalib and Ed Mansoor	281
Rainfall Characteri	Stics of Coastal Andhra Pradesh by V. V. Jagannadha Sarma.	
Reviewed by Subha	ычоп Das	287
	NEWS AND MOTES	
2022 Joshimath Subsice	NEWS AND NOTES dence.	289
	Elected as a Fellow of the International Science Council.	209
N. RAJENDRAN and I	B. Mahabaleswar	290
Granite-hosted Cu-Au Abhishek Kumar Sh	Mineralization in the Machanur Deposit, Eastern Dharwar Craton. HUKLA, DSILVA DANIRA S. and M.N. PRAVEEN	291
Mafic-Felsic Magn	lti-stage Growth History of Ladakh Batholith, Trans-Himalaya, through na Mixing and Fractionation.	
SANTOSH KUMAR		292
	rsity Conservation for Women Scientist/ Technologists. Pandey and Ansuya Bhandari	202
TUBLAM DAS, SHILFA	I ANDEI and ANSUIA BHANDARI	293
	OBITUARY	
Prof. S.N. Rajaguru (1 HEMA ACHYUTHAN		205
TIEMA ACHTOTHAN		295
Cover		
Fig. 1. Geological map (for details see pages 1	of Manipur, updated after Soibam (1998). Tombinoutek landslide location is indicated by 'L'. 56-164)	
खान ब्यूरा		
REAU OF MINES	ADDRESS OF EDITOR	
G.M. Bhat,	ers intended for publication and also related correspondence should be addressed to: Editor-in-Chief, Department of Geology, University of Jammu, Jammu - 180 006, India. bhatgm@jugaa.com; editorjournalgsi@gmail.com; Editor_JGSI@geosocindia.org; Mobile: 91-9419200120; Website: http://www.geosocindia.org.	
पुस्तक।लग		
11. 11 2 2		

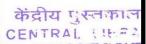
AN BU

20

Journal of the Geological Society of India, Vol.99 No.03, March 2023

JUUNNAL

of



THE GEOLOGICAL SOCIETY OF INDIA

(Abstracted/Indexed in AGI's Bibliography and Index of Geology, Chemical Abstracts, Current Contents, GEOBASE, GEoRef, Mineralogical Abstracts, GeoArchive, Thomson ISI database (SCIE, CC/PC & ES))

Vol. 99 MARCH 2023 No. 3

CONTENTS

EDITORIAL

If a Magnitude ~8 Earthquake Occurs in India Today......

HARSH K. GUPTA	299
RESEARCH ARTICLES	
Successful Alert Issuance with Sufficient Lead Time by Uttarakhand State Earthquake Early Warning System: Case Study of Nepal Earthquakes.	
PANKAJ KUMAR, KAMAL, M.L. SHARMA, PRATIBHA, R.S. JAKKA, ASHOK KUMAR, G.C. JOSHI and PIYOOSH RAUTELA	303
Dickinsonia tenuis reported by Retallack et al. 2021 is not a fossil, instead an impression of an extant 'fallen beehive'.	
S.K. Pandey, Shamim Ahmad and Mukund Sharma	311
A Climatic Surprise – Slope Instability Triggered by Heavy Rain in Maldevta Region, Dehradun, Uttarakhand, on 20 August, 2022.	
KALACHAND SAIN, MANISH MEHTA, VINIT KUMAR, VIKRAM GUPTA and PANKAJ CHAUHAN	317
Petrochemistry, Petrogenesis and Geodynamic Implications of Mantle Plume Generated Dhanjori Volcanics, Singhbhum Craton (Eastern India).	
S.K. Dwivedi, Priyanka Tripathi, G. Parthasarathy, S.H. Jafri, M. Satyanarayanan and O.P. Pandey	321
Role of Depleted-MORB Mantle in the Genesis of Basalts from the Neoarchean Eastern Felsic Volcanic Terrane of the Sandur Greenstone belt, Dharwar Craton, India.	
G. Harshitha Reddy, C. Manikyamba and Th. Dhanakumar Singh	331
Effect of Coal Seam Presence In-Between Comparatively Denser Layers Over High Wall Slope Stability - A Case Study of Kistaram Project, Singareni Collieries Company Limited (SCCL).	
V. Surya Jaya Chandra, Sandeep Panchal and Nikhil Ninad Sirdesai	338
Origin of Alteration Patterns in Accessory Chromites from the Kudada Metaperidotites, East Singhbhum District (Jharkhand, India).	
RATUL BANERJEE, BIJAY K. BISWAS and SISIR K. MONDAL	345
Early Miocene (Burdigalian) Dinoflagellate Cysts from the Kerala Basin, Southwest India: Indicators of Marine Ingression at the Onset of the Mid-Miocene Climate Optimum (MMCO).	
YOGESH PAL SINGH, POONAM VERMA, ABHA SINGH and RAMESHWAR BALI	357
Efficacy of Landslide Susceptibility Maps Prepared Using Different Bivariate Methods: Case Study from Mussoorie Township, Garhwal Himalaya.	
VIKRAM GUPTA, PRATAP RAM, RUCHIKA S. TANDON and NEERAJ VISHWAKARMA	370

Journal of the Geological Society of India, Vol.99 No.03, March 2023

Leing CIS Technique	pping for Ladakh, and Jammu & Kashmir
Using GIS Technique. BHAGYARAJ, U. and SREEVALSA KOLATHAYAR	
Assessment of Trace Metal Pollution in Surface Sediments fro	om Southwestern Part of Bay of Bengal, India.
HARIKRISHNAN SADANANDAN, SENTHIL NATHAN DHARMALINGAM,	, MOUTTOUCOMARASSAMY SRIDHARAN,
NITIN AGARWAL and NAGARAJAN ANBUSELVAN	
tudy of Freeze-thaw Induced Damage Characteristic for Hi	malayan Schist.
A.K. Verma, Sahil Sardana and Amit Jaiswal	
Jbiquitous Chemical Signature in Khondalites of Eastern Gl	hats Granulite Belt, a Possible Explanation
Rajib Kar	
Estimation of Soil Erosion Using RUSLE Model and GIS Too	ols: A Study of Chilika Lake, Odisha.
DHIROJ KUMAR BEHERA, SALEHA JAMAL, WANI SUHAIL AHMAD,	Mohd Taqi and Rajiv Kumar
GIS-based Spatial Variability and Water Quality Index (WQ	1) Wodeling of Trace Elements in Groundwater
of Jamshedpur, Eastern India. Jaydev Kumar Mahatoa, Shivam Sawa, Nishi Kanta, Rohit	PATEL A 2nd BRAHMDEO YADAV
Impact of Altitude on Soil Physico-chemical Properties in a T	Topo-Sequence in Mid Himalayan Watershed: A
Case Study from Dehradun District, Uttarakhand.	
Uma Kant Maurya Trisha Roy, Bankey Bihari, Madan Sin	GH, RAJESH BISHNOI, DARSHAN M. KADAM,
Lakhan Singh, S.S. Shrimali, M. Muruganandam, Suresh F	Kumar, S.K. Sharma, Rakesh Kumar,
ANIL MALIK and RAMESH VERM	
ANIL MALIK and KAMESH TERM	
Assessment of Groundwater and Surface Soil using Multivar	riate Statistical Techniques and Contamination
	riate Statistical Techniques and Contamination
Assessment of Groundwater and Surface Soil using Multivar	riate Statistical Techniques and Contamination
Assessment of Groundwater and Surface Soil using Multivar	riate Statistical Techniques and Contamination
Assessment of Groundwater and Surface Soil using Multivar	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR
Assessment of Groundwater and Surface Soil using Multivan Indices: A Case Study of Gurugram Millennium City, Ha Vishal Panghal, Rachna Bhateria, Rohit Kumar, Sunder S	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha VISHAL PANGHAL, RACHNA BHATERIA, ROHIT KUMAR, SUNDER S CORRESPO	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR ONDENCE lia Today and Tomorrow.
Assessment of Groundwater and Surface Soil using Multivan Indices: A Case Study of Gurugram Millennium City, Ha Vishal Panghal, Rachna Bhateria, Rohit Kumar, Sunder S	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR ONDENCE lia Today and Tomorrow.
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha Vishal Panghal, Rachna Bhateria, Rohit Kumar, Sunder S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. Krishna	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR ONDENCE lia Today and Tomorrow.
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha Vishal Panghal, Rachna Bhateria, Rohit Kumar, Sunder S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. Krishna	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR ONDENCE lia Today and Tomorrow.
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha Vishal Panghal, Rachna Bhateria, Rohit Kumar, Sunder S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. Krishna Emerging Energy Resources in India Avtar K. Raina	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR ONDENCE lia Today and Tomorrow.
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha Vishal Panghal, Rachna Bhateria, Rohit Kumar, Sunder S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. Krishna Emerging Energy Resources in India Avtar K. Raina	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR ONDENCE lia Today and Tomorrow.
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha Vishal Panghal, Rachna Bhateria, Rohit Kumar, Sunder S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. Krishna Emerging Energy Resources in India Avtar K. Raina	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR ONDENCE lia Today and Tomorrow.
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha Vishal Panghal, Rachna Bhateria, Rohit Kumar, Sunder S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. Krishna Emerging Energy Resources in India Avtar K. Raina	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR ONDENCE lia Today and Tomorrow.
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha VISHAL PANGHAL, RACHNA BHATERIA, ROHIT KUMAR, SUNDER S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. KRISHNA Emerging Energy Resources in India AVTAR K. RAINA INDIAN BUREAU OF MINES	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR ONDENCE lia Today and Tomorrow.
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha VISHAL PANGHAL, RACHNA BHATERIA, ROHIT KUMAR, SUNDER S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. KRISHNA Emerging Energy Resources in India AVTAR K. RAINA INDIAN BUREAU OF MINES	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA AND SUNIL KUMAR
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha VISHAL PANGHAL, RACHNA BHATERIA, ROHIT KUMAR, SUNDER S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. KRISHNA Emerging Energy Resources in India AVTAR K. RAINA INDIAN BUREAU OF MINES	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR ONDENCE lia Today and Tomorrow.
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha VISHAL PANGHAL, RACHNA BHATERIA, ROHIT KUMAR, SUNDER S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. KRISHNA Emerging Energy Resources in India AVTAR K. RAINA NOTAR K. RAINA NOTAR MAR 2007:	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA AND SUNIL KUMAR
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha VISHAL PANGHAL, RACHNA BHATERIA, ROHIT KUMAR, SUNDER S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. KRISHNA Emerging Energy Resources in India AVTAR K. RAINA NOTAR MAR 2007:	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA AND SUNIL KUMAR
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha VISHAL PANGHAL, RACHNA BHATERIA, ROHIT KUMAR, SUNDER S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. KRISHNA Emerging Energy Resources in India AVTAR K. RAINA NOTAR K. RAINA NOTAR MAR 2007:	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA AND SUNIL KUMAR
Assessment of Groundwater and Surface Soil using Multivar Indices: A Case Study of Gurugram Millennium City, Ha VISHAL PANGHAL, RACHNA BHATERIA, ROHIT KUMAR, SUNDER S CORRESPO Groundwater Sustainability, Security and Equity: Ind B.R. KRISHNA Emerging Energy Resources in India AVTAR K. RAINA INDIAN BUREAU OF MINES	riate Statistical Techniques and Contamination aryana, India. SINGH ARYA and SUNIL KUMAR ONDENCE lia Today and Tomorrow.

Seismic array of Uttarakhand State Earthquake Early Warning System (UEEWS). For details see pages 303-310

ADDRESS OF EDITOR

All papers intended for publication and also related correspondence should be addressed to:

G.M. Bhat, Editor-in-Chief, Department of Geology, University of Jammu, Jammu - 180 005, India

Email: bhatgm@jugaa.com; editorjournalgsi@gmail.com; Editor_JGSI@geoscinfia.org

Mobile: 91-9419200120; Website: http://www.geosocindia.org.

298

Minerals & Metals Review, Vol.49 No.01, January 2023

Market Reports

- 12 Steel Supply chain alternation to lift local prices from Dec lows
- 15 Aluminium White metal continues to sink
- 16 Copper Red metal poised to make a dicey start and finish stronger in 2023
- 18 Zinc Market to be in deficit during 2023 despite higher smelter production
- 21 Lead Posts positive trends in Dec as demand exceeds supply
- 22 Nickel The metal traded on positive note in Dec over supply concern from Russia
- 23 Tin Soldering metal up as China reopening boosts sentiments
- 24 Silver Stronger demand, weaker dollar is seen to be positive for the white metal in 2023
- 27 Bullion The yellow metal prices moved up in Dec on China easing Covid curbs, hopes of slower US rate hikes

Leaders Speak

- 28 SAIL will add to India's growth story by focussing on intrinsic strength and resources at disposal
- 30 Expect 2023 to be a better year than 2022 for the steel industry globally
- 34 JSW well geared to meet future steel demand with its prudent investment strategies
- 36 AM/NS India to produce high-strength, coated steel under PLI Scheme
- 39 Encourage creation of primary copper production capacity in India
- 41 Optimistic for 2023 as momentum gains for transition to clean technologies
- 42 HZL fully geared to deliver a stellar performance this year
- 46 The Circular Economy Park Policy for Maharashtra to come up soon
- 48 Tire Trends in Earthmoving Industry

In Conversation

51 Indian ferro alloys market to grow at a 5.6% CAGR to reach \$187.25 bn by 2030

Metals Outlook

- 54 Steel industry's capacity utilisation levels to slide in FY2024
- 59 Steel Industry: Thinking about 2050 and beyond
- 63 2023 will be a year of two-halves; China's recovery holds key
- 64 Copper is critical to achieve India's Amrit Kaal vision
- 66 Price corrections and cost pressures to shrink margins of primary Al makers
- 70 Aluminium Market Review 2023
- 71 Indian coal industry an overview

Market Trends

84 Ten predictions for 2023

Policy View

89 Mining in India: A penal industry

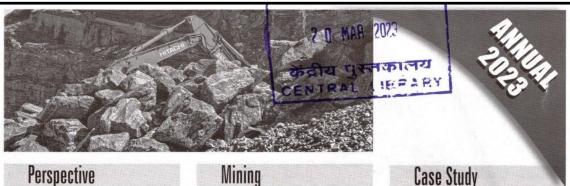
Budget Recommendations

90 Budget 2023:
Domestic AI industry seeks
correction of inverted
duty on raw materials



Minerals & Metals Review - January 2023 □ 10

Minerals & Metals Review, Vol.49 No.01, January 2023



Monetising mountains of mineral wastes / rejects: (case of iron ore, bauxite, manganese ore and chromite)

Copper

- 95 Global copper output to reach 24 mt in 2024
- Renewable energy, electric vehicle 96 revolution to drive copper demand

Aluminium

With India's growing economic might, secondary Al to play crucial role

Lead & Zinc

102 ILZDA international meet on lead & lead batteries recommendations & suggestions

Precious Metals

106 Revenue of organised gold jewellery retailers to rise 23-25%

Coal

Coal production to reach lifetime high of 850-900 mt by FY23-end

108 Global mining sector outlook weakens on reduced profits, cash flows

Women In Mining

Women workforce in the mining industry

Region Focus

112 Industry 1.0 to 4.0 and on to 5.0 - India and Odisha

Techno Track

Improving desulphurisation efficiency in silicon killed steel melts

Additive Manufacturing

Additive mfg market size worth \$25.17 bn by 2028

Sustainability Corner

- India's opportunity for steel decarbonisation
- Sustainability in mobility: Moving towards a cleaner & greener future

138 Sulzer - Partnering for the future

Company Profile

- Sunvik Steels green technology, sustainability and safety at the heart of manufacturing
- Shah Group of Companies "The complete solution in steel"
- Evconturbo Identification of quality Tmt producers

Product Profile

- Slurry pumps engineered for today's operations
- NEW ITI-1600 (N) Portable Digital 150 Ultrasonic Thickness Gauge

Events

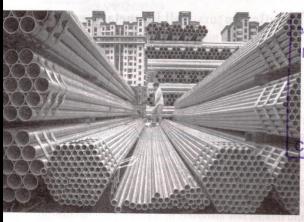
- 153 ALUCAST 2022 —The biennial International Conference and Exhibition on Die Casting Technology, concludes successfully
- 154 Nobel Series Seminar 2022 seeks to provide inclusive platform for India's Amrit Kaal

Statistics

155

Minerals & Metals Review - January 2023

Minerals & Metals Review, Vol.49 No.02, February 2023



05 Market Reports

Budget Impact

Budget 2023-24 impact on steel and other metals

20 Policy View

Odisha govt forms panel to probe underreporting of high-grade iron ore

23 Steel

e-mobility: Steel and aluminium in a smart material mix

Steel industry facing challenges as borrowing levels rise, earnings moderate

1st qtr 2023 could be difficult for global long products market

Steel export demand to remain subdued due to global slowdown

Steel exports to major markets decline in April-Dec period

33 Coal

India gearing up to produce more coal to meet future demand

Rapid renewable expansion will drive down gas, coal generation over next 2 yrs: EIA

36 Iron Ore Update

Restructuring of iron & steel industry is bound to give a new scenario to the steel sector

Prices of iron ore likely to rise

39 Copper Update

Copper demand back on growth track in FY22

NDIAN BUREAU OF M ? 0 MAR २००२: केंद्रीय पुस्तकालय ENTRAL LIBRARY

40 Aluminium

Aluminium capex to triple over next 5 fiscals on strong demand

43 Auto Monitor

Automotive sector growth to be moderate in near to medium term

44 OEM Strategy

India's shifting automotive procurement mandate

40 Decarbonization

Decarbonization challenge for steel

Regional Profile

Africa - mining by the numbers, 2022

57 Energy Watch

Outlining the roadmap for a sustainable future thru clean fuel & energy solutions

ງິ່ງ Facility Launch

Ametek India opens new facility to provide support across industries

60 Events

IMTMA honours their founding father Sir Dhanjishah Bomanji Cooper at IMTEX 2023

Delhi to host Global Zinc Summit 2023

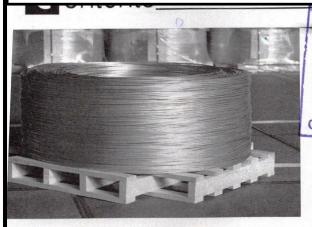
Volvo and Eicher showcase future-ready mobility solutions aligned with vision of Smart Sustainability

Kazakhstan, AIAI & WTC Mumbai to jointly promote bilateral trade

b Statistics

Minerals & Metals Review - February 2023 4

Minerals & Metals Review, Vol.49 No.03, March 2023



07 Market Reports

18 Wire & Cable

Budget focus on infra & enhanced investment in railways to spur demand for wire & cable

Wires & cables market projected to grow at CAGR of 4.2% from 2023 to 2030

How much do you know about wires and cables for new energy vehicles?

26 Tubes

Rapid urbanization, oil & gas to drive demand for copper tubes in India

Overhead cables are cheap & safe, and the global market is large

Hydrogen pipeline "H2Med": Opportunities for process technology

35 Copper

Copper may rule at elevated levels in 2023 Secondary copper production need to be incentivized to meet ever rising demand

38 In Conversation

Ganpati Engineering Ind – putting the industry on a growth pedestal

42 Steel

The green wave for the steel industry

44 Iron Ore Update

Iron ore price heading to \$US150 a tonn

47 Circular Economy

Metallic raw materials – the building blocks of the circular economy

Molybdenum prices up on rising global demand

Raw Material Update

खान ब्यर

53 Techno Trends

thyssenkrupp employs new-age technology to produce superior grades of CRGO

54 Automation Update

Industrial automation maker offers in-house hardening capabilities with SECO/WARWICK technology

55 Company Profile

Bühler shows profitable growth in 2022

59 Product Profile

The VIM furnace for casting copper alloys makes foray into India

60 Events

ELECRAMA 2023 dazzles with 1000 exhibitors showcasing Global Innovations

Int'l Aluminium Conference 2023 concludes on high note

Mining Industry's 'Mega Mining' event hosted by Metalogic PMS

VDMA Thermprocess Forum at Düsseldorf's leading trade fair THERMPROCESS

68 Statistics



Minerals & Metals Review - March 2023 □ 6