



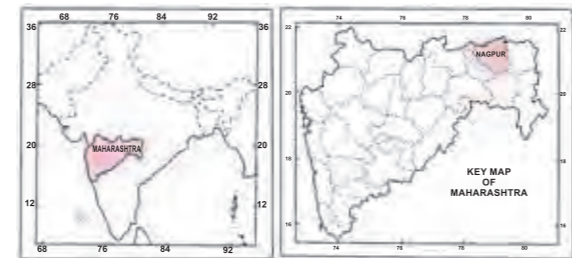
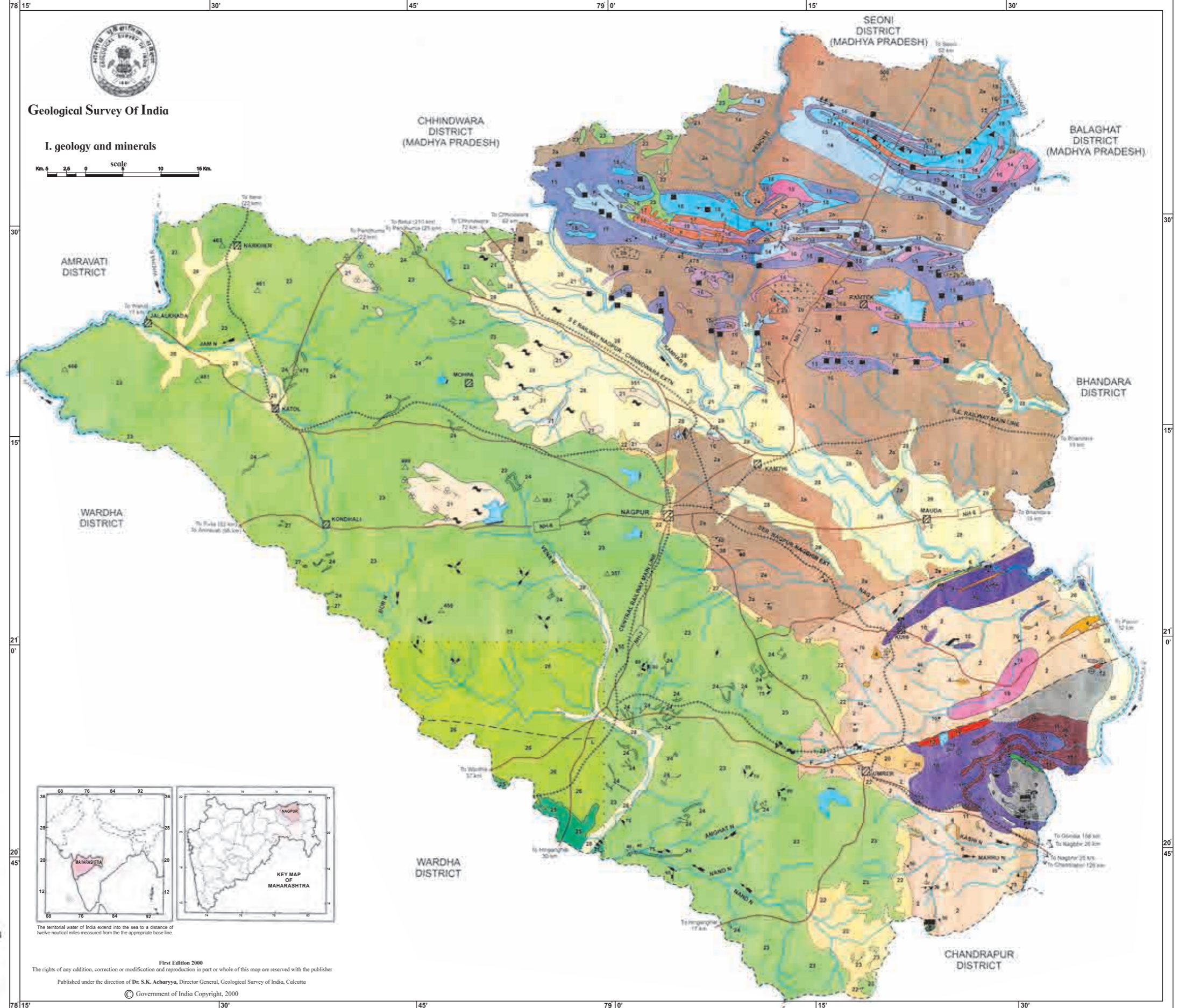
THE EARTH MATTERS



GEOLOGY

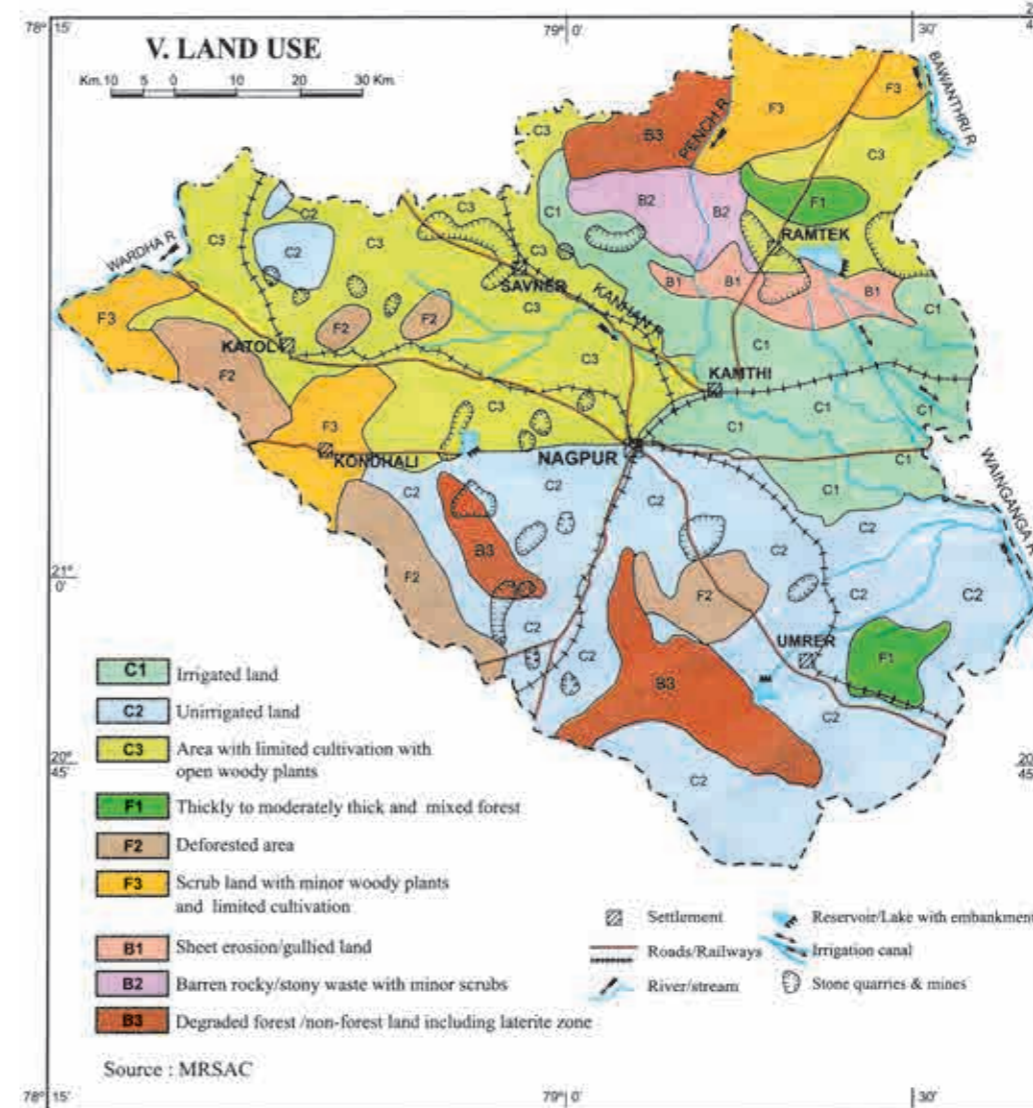
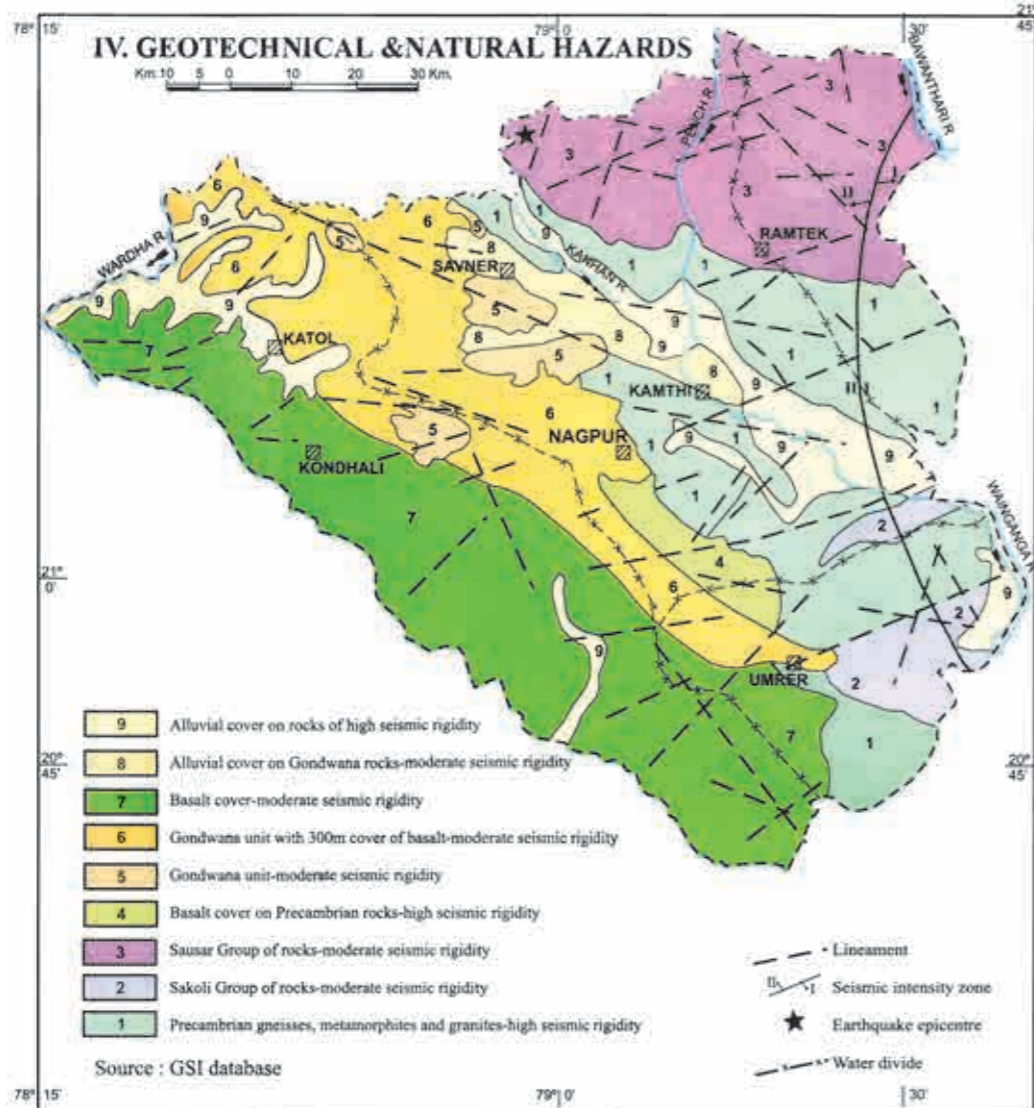
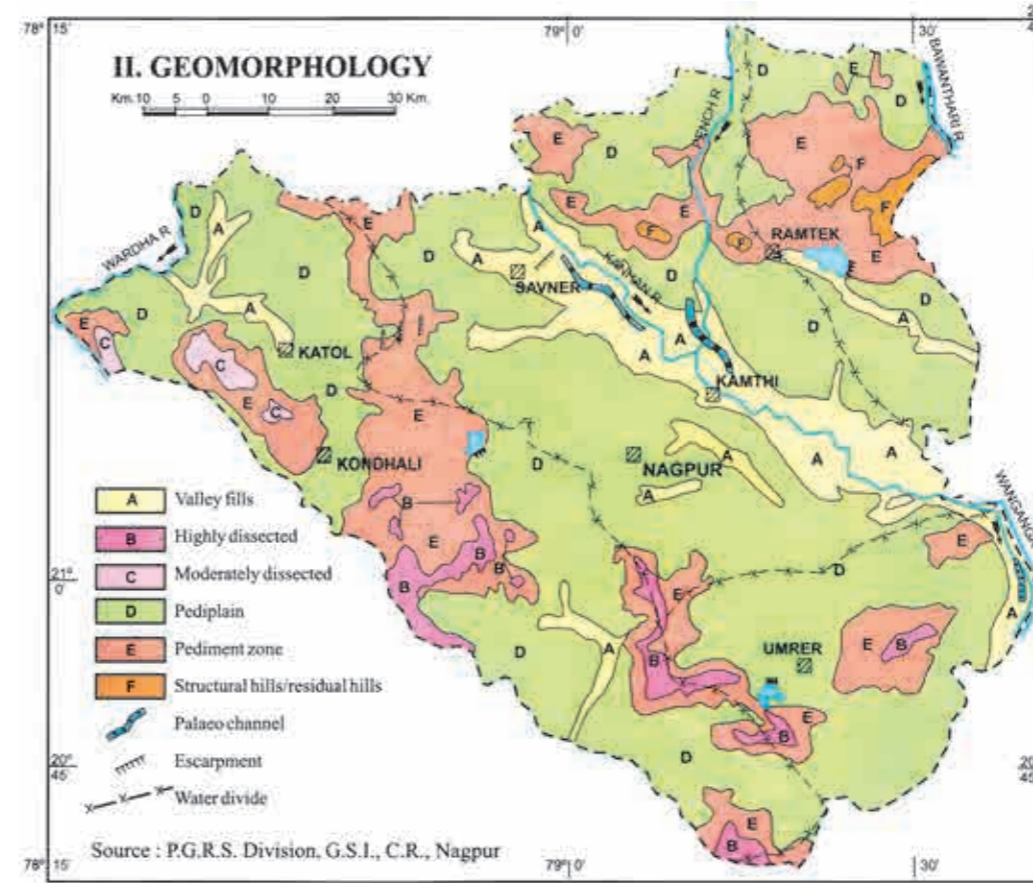
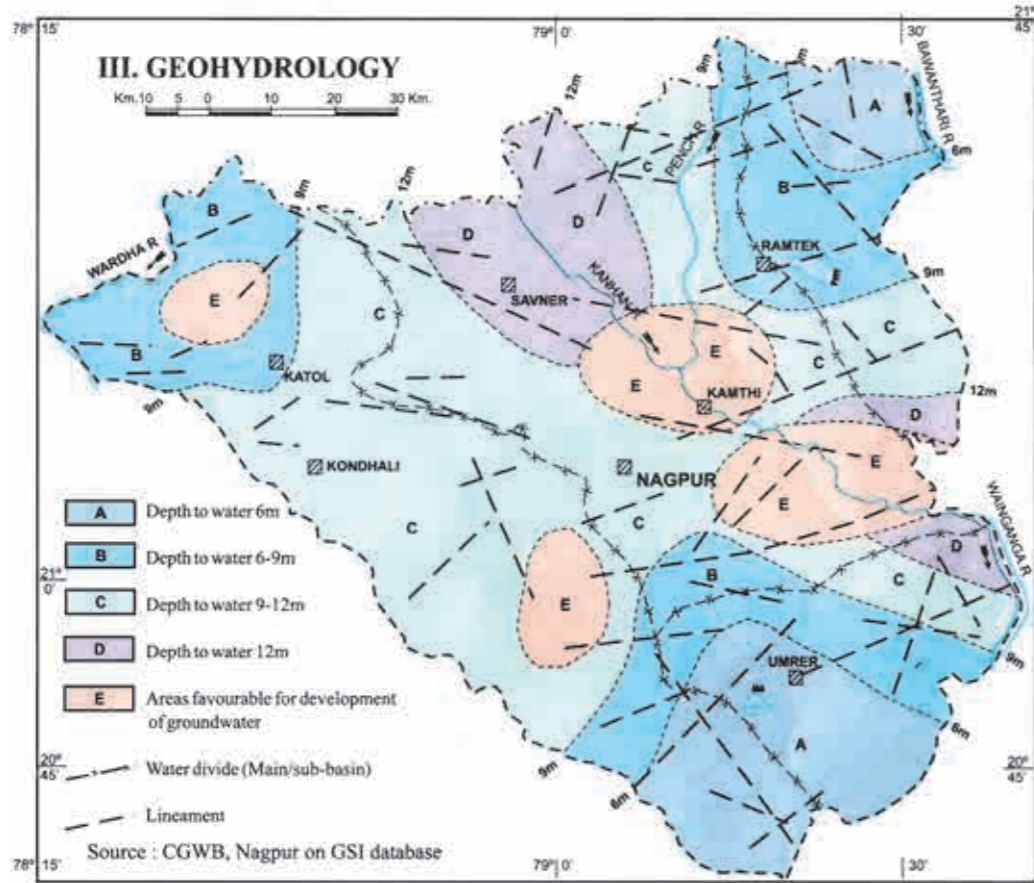
STD ELEVEN

- LITHOLOGY**
- 28 Alluvium
 - 27 Laterite
 - 26 18 simple flows of basalt
 - 25 6 flows of basalt (3 simple & 3 compound)
 - 24 Intertrappean beds
 - 23 Undifferentiated basalt
 - 22 Conglomerate, sandstone, shale, limestone
 - 21 Sandstone and ferruginous Sandstone
 - 20 Boulder bed, sandstone, shale
 - 19 Granite, pegmatite
 - 18 Crystalline limestone, dolomite
 - 17 Muscovite-biotite schist, quartz-biotite and granulite
 - 16 Quartzite and quartz-muscovite schist
 - 15 Muscovite-biotite schist with manganese ore
 - 14 Calc-gneiss and manganiferous marble with manganese ore pockets
 - 13 Quartz-muscovite schist, feldspar-muscovite schist and intercalated quartzite
 - 12 Silicified zone, quartz reef
 - 11 Metarhyolite, tuff, felsic volcanics and associated tuff
 - 10 Mica schist
 - 9 Phyllite, carbonaceous phyllite
 - 8 Tourmalinite, coticule
 - 7 Metabasalt with associated tuff
 - 6 Amphibolite
 - 5 Ultramafic rock
 - 4 Quartzite (± Kyanite, Sillimanite)
 - 3 Calc-silicate rock
 - 2 Granite gneiss with migmatite gneiss
- 2a 2b
- Granitic gneisses with migmatite/ granite**
- 1 **Granulite**



The territorial water of India extends into the sea to a distance of twelve nautical miles measured from the appropriate base line.

First Edition 2000
The rights of any addition, correction or modification and reproduction in part or whole of this map are reserved with the publisher
Published under the direction of Dr. S.K. Acharya, Director General, Geological Survey of India, Calcutta
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GEOLOGY

Standard XI



2019

**Maharashtra State Bureau of Textbook Production and
Curriculum Research, Pune.**



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Geology Subject Committee:

Dr. N. J. Pawar (Chairperson), Pune
Dr. I. A. Khan, Pune
Dr. Satish Jagdeo Sangode, Pune
Dr. Sudhakar Janardan Pandit, Pune
Shri Ajit Vaman Vartak, Pune
Mrs. Suneeti J. Malik, Pune
Shri Abhijit Jaysingrao Patil, Kolhapur
Shri Ravikiran Jadhav, Member-Secretary

Geology Study Group:

Dr. Hrishikesh Samant, Mumbai
Dr. Ashwini Supekar Ganjave, Pune
Dr. Deepak Panaskar, Nanded
Mr. Arun Keshav Khadilkar, Solapur

Chief Coordinator

Mrs. Prachi Ravindra Sathe

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The Constitution of India

Preamble

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens:

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity; and to promote among them all

FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation;

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

NATIONAL ANTHEM

Jana-gana-mana-adhināyaka jaya hē
Bhārata-bhāgya-vidhātā,

Panjāba-Sindhu-Gujarāta-Marāthā
Drāvida-Utkala-Banga

Vindhya-Himāchala-Yamunā-Gangā
uchchala-jaladhi-taranga

Tava subha nāmē jāgē, tava subha āsisa māgē,
gāhē tava jaya-gāthā,

Jana-gana-mangala-dāyaka jaya hē
Bhārata-bhāgya-vidhātā,

Jaya hē, Jaya hē, Jaya hē,
Jaya jaya jaya, jaya hē.

PLEDGE

India is my country. All Indians
are my brothers and sisters.

I love my country, and I am proud
of its rich and varied heritage. I shall
always strive to be worthy of it.

I shall give my parents, teachers
and all elders respect, and treat
everyone with courtesy.

To my country and my people,
I pledge my devotion. In their
well-being and prosperity alone lies
my happiness.

Preface

Dear Students,

Welcome to Standard Eleven!

So far you have learnt Geology as part of Geography. This book presents an extended view to the magnificent world of geology dealing with formation of Solar system, evolution of our planet and the way in which variety of rocks, minerals and landforms are created. It gives me immense pleasure to place this new edition of class XI text book in your hands.

This book is an accessible and comprehensive guide to the important topics in geology, richly illustrated with examples from India in general and the state of Maharashtra in particular. It also includes numerous embedded exercises and activities, designed to encourage the students so as to engage with the concepts presented.

Geologists are scientists who study the structure and dynamics of the Earth and its natural resources. They also review human intervention on the Earth's resources, like metals, oil and gas so that they can be exploited for commercial purposes without much damage to the environment. They are also involved in the conservation of environment and study of climate change. They help analyse natural disasters and ensure safety, suitability and sustainability of sites chosen for mining, construction of roads, tunnels, bridges, dams etc.

The teaching in geology is expected to inculcate analytical skills through observation and understanding of the processes operating on the Earth. Use QR Code / link given in the textbook. The students will find this book interesting and useful for selecting geology as a career option.



(Dr. Sunil Magar)

Director

Maharashtra State Bureau of
Textbook Production and
Curriculum Research, Pune

Pune

Date : 20 June 2019

Bharatiya Saur Dinank : 30 Jyeshtha 1941

CLASS 11 Geology

Learning Outcomes

- The goal of this book is to introduce students with fundamental knowledge of diverse fields in geology like mineralogy, stratigraphy, geomorphology etc and understand the scope of the subject.
- In addition, it is imperative that the students :
- Learn to think scientifically, analytically and apply scientific methods in their practical work.
- Understand the concept on origin of the Earth and planetary system.
- Know the processes involved in the formation of various types of common surface features.
- Identify the common rock forming minerals and the underlying processes.
- Communicate the geological information, both in classical and common man's language.
- Collect, illustrate and analyse basic geological information from the field.
- Interpret geological maps and construct cross sections.
- Develop and aptitude for detailed understanding of rocks and minerals.
- Communicate observations and interpretation in a geological report.

- For Teachers -

As we know, the subject of geology is highly interdisciplinary and hence teaching geology is a challenging task that needs integration of both theoretical and practical aspects. After the edition published in 2011, there have been tremendous developments in the subject vis-a-vis improvement in methodology of teaching, demanding an update of standard XI geology textbook. The geology teacher therefore, essentially needs to be updated with the latest developments. In this context, following guidelines should be followed to improve the overall teaching of the subject.

- ◆ Please refer to Science and Geography textbooks from standard V to standard X before using this textbook.
- ◆ To begin with, get familiar with the textbook yourself and enhance the subject by referencing and cross referencing the concepts, adding case studies and updating new information.
- ◆ Plan carefully and independently for the teaching of the content and supervising activities in each chapter.
- ◆ The present book has been prepared for constructive and activity-based teaching.
- ◆ The teaching learning interactions, processes and participation of all students is very necessary and so is your active guidance.
- ◆ Use geological aids for appropriate understanding of the concepts.
- ◆ Some chapters may be difficult to follow and therefore you are expected to utilize the allotted number of periods fully. Do not finish the chapter in short.
- ◆ Major concepts of geology are not easy to understand and have a scientific base. Hence, encourage group work putting in collective efforts. This will help the students to assimilate the content without feeling the 'burden of learning'.
- ◆ Facilitate peer learning as much as possible by frequently reorganizing the class structure.
- ◆ Please do not teach the lessons in the book by just reading them aloud.
- ◆ Follow the order of the chapters as given in the content as the concepts have been introduced in a sequence to facilitate knowledge building.
- ◆ Do not use the boxes titled 'Do you know?' for evaluation.
- ◆ Use QR Code given in the textbook. Some weblinks have been given at the end of the book.
- ◆ Teacher as well as students are expected to use these references. These references will surely help to explore knowledge beyond the textbook.
- ◆ The book contains an exercise based on the back cover. Teachers are requested to instruct the students to remove the cover in order to study this page and solve the exercise.
- ◆ Please bear in mind that extra reading is always helpful for in depth understanding of the subject.
- ◆ Use thought-provoking, activity-oriented, open-ended, multiple choice questions for evaluation. Some examples are given at the end of every chapter.

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Front Page : This page gives the gist of the entire book. Hexagons represent pictures unique to the Deccan traps specific to Maharashtra.

Back Page : Philately is the science of study and collection of stamps of minerals. This page represents philatelic mineralogy and mineral nomenclature.

Acknowledgement : Geological Survey of India for maps
A.V.Vartak, SudhaVaddadi, C.Rajeshekhar and Rohit. A.Vartak for Back Cover.