

1.3.1 Cross Cutting Issues - Environment and Sustainability



Shri Amolak Jain Vidya Prarsarak Mandal's
Smt.S.K.Gandhi Arts, Amolak Science &
P.H. Gandhi Commerce College,

Kada, Dist - Beed (M.S.) 414202



कृषी दिन

दिनांक - 9 जुलै २०२२



1.3.1 Cross Cutting Issues - *Environment and Sustainability*

Workshop on Eco friendly Ganesha making



1.3.1 Cross Cutting Issues - Environment and Sustainability



1.3.1 Cross Cutting Issues - Environment and Sustainability




Principal
S.A.J.V.P.M.Kada's
Smt.S.K.Gandhi Arts, Amolok Science
P.H.Gaadhi Commerce College, Kada

1.3.1 Cross Cutting Issues - Environment and Sustainability

Tree Plantation



1.3.1 Cross Cutting Issues - Environment and Sustainability



1.3.1 Cross Cutting Issues - Environment and Sustainability



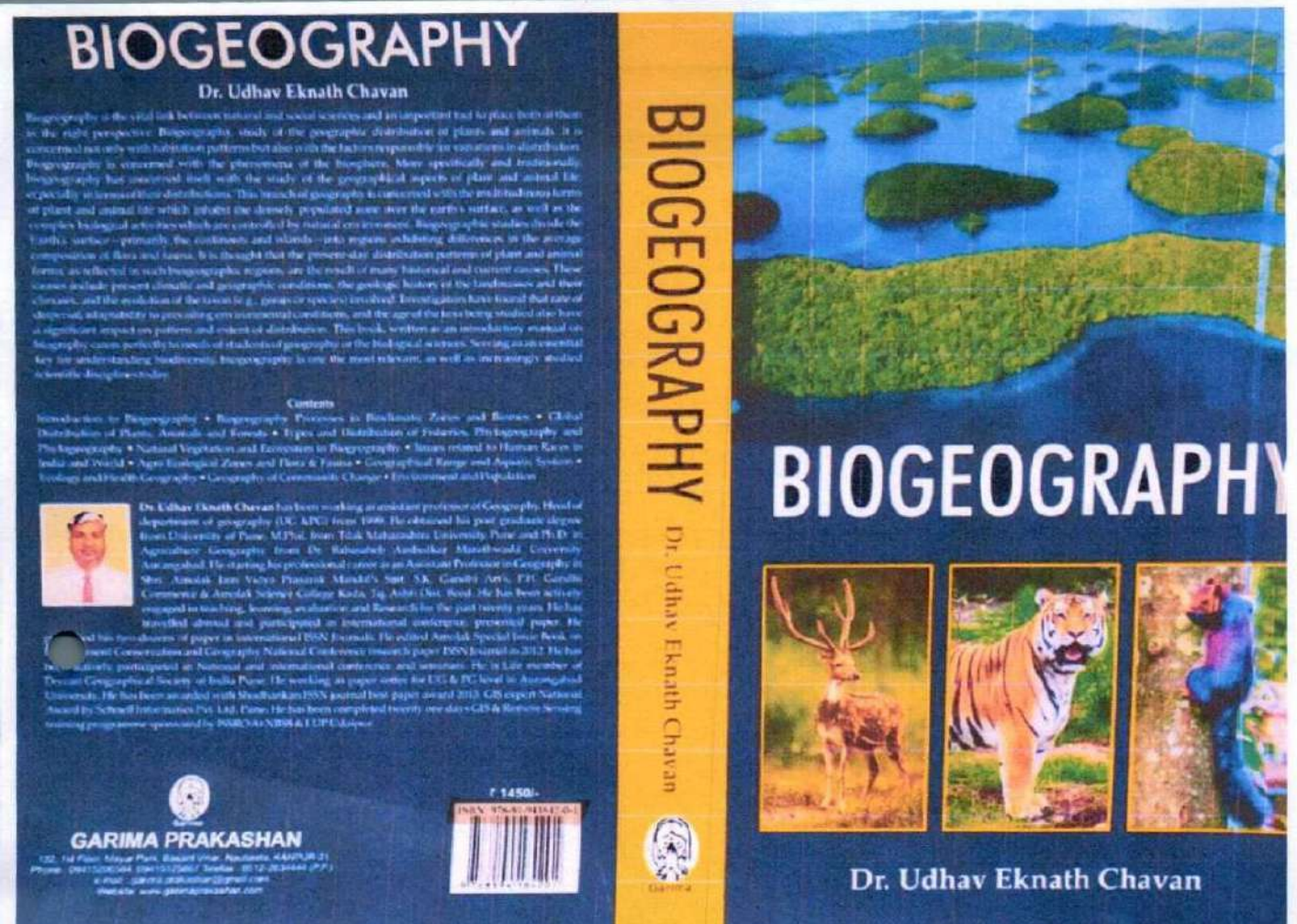
1.3.1 Cross Cutting Issues - Environment and Sustainability




Principal
S.A.J.V.P.M.Kada's
Smt.S.K.Gandhi Arts, Amolok Science
P.H.Gandhi Commerce College, Kada

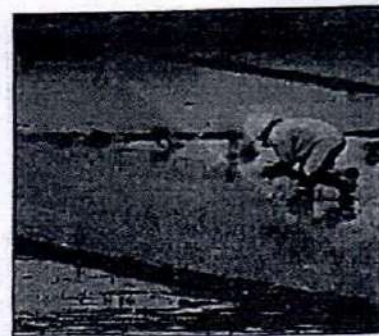
1.3.1 Cross Cutting Issues - Environment and Sustainability

Books Published by Faculty



Agricultural Economics

Dr. Ashok M. Korade
Miss. Anuradha Paulbudhe



1.3.1 Cross Cutting Issues - Environment and Sustainability Books Published by Faculty

Agricultural Economics

About the author



Dr. Ashok Maruti Korade (born 1975) is working as Head & Associate Professor of Economics at Smt S.K.Gandhi Arts, Amolak Science & P.H.Gandhi Commerce College, Kada, Tal: -Ashti, Dist: -Beed, affiliated to Dr.Babasaheb Ambedkar Marathwada University Aurangabad. his Educational qualification is M.A. M.Phil, Ph.D in Economics. He joined the college on 05th Aug 1999 and been working as a Lecturer in Economics for last 22 years and also Head of Economics Department. From the year 2003-04 to 2010-11 he worked as N.S.S. Programme officer and N.S.S. Divisional Coordinator from 2007 to 2011. He worked as Program officer Lifelong learning and Extension Department from 2011-12 till 2018-19. He is also a Ph.D research guide and 6 students are perusing Ph.D. He has written 45 research papers in university level, state level, national, international level, seminars, workshops, and working as Co-ordinator of Yashwantrao Chavan Maharashtra Open University, Nashik at the center of S.K.Gandhi College, Kada. He is also the Member of the Board of Economics Studies Lifelong learning and Extension Services Member of Dr. BAMU, Aurangabad till 2017-18 to 2021-22. This reference book will be useful for students of BA, MA, M.Phil, Ph.D.



Miss. Anuradha Paulbudhe is a reasearch Scholar doing Ph.D in Economics at Dr. Babasaheb Ambedkar Marathwada University, Aurangabad under the guidance of Professor .Dr. Ashok M. Korade , S. K. Gandhi College, Head of department economics, Kada, Tal. Ashti, Dist. Beed. She Participated and published Research Papers in 2 International Conferences and also Published 10 Research Papers in National Seminars, and 4 articles published in State level Reseach Journals.

Contents

Introduction • Small Farming Systems • Economic Reforms Process on Indian Agricultural Sector • Industrial Vegetable, Fruit Growing and Packing Techniques • Cost of Crops Production • Distribution of Food Production • Agricultural Economic Policy and Development Planning & Management of Agriculture • Contract Farming • Agricultural Processing Industry • Agricultural Government Policy • Economy of Landlord Farming in Commercial Agriculture.



Sahitya Sagar

128/23R, Ravindra Nagar
Yashoda Nagar, Kanpur-11

available on



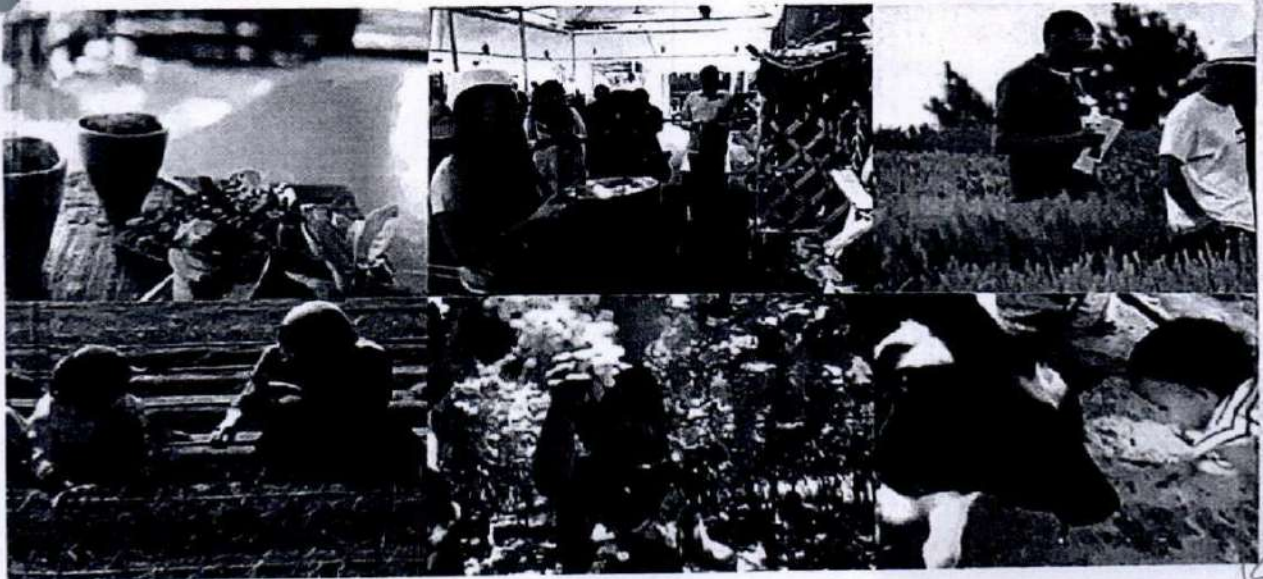
1.3.1 Cross Cutting Issues - Environment and Sustainability
Books Published by Faculty



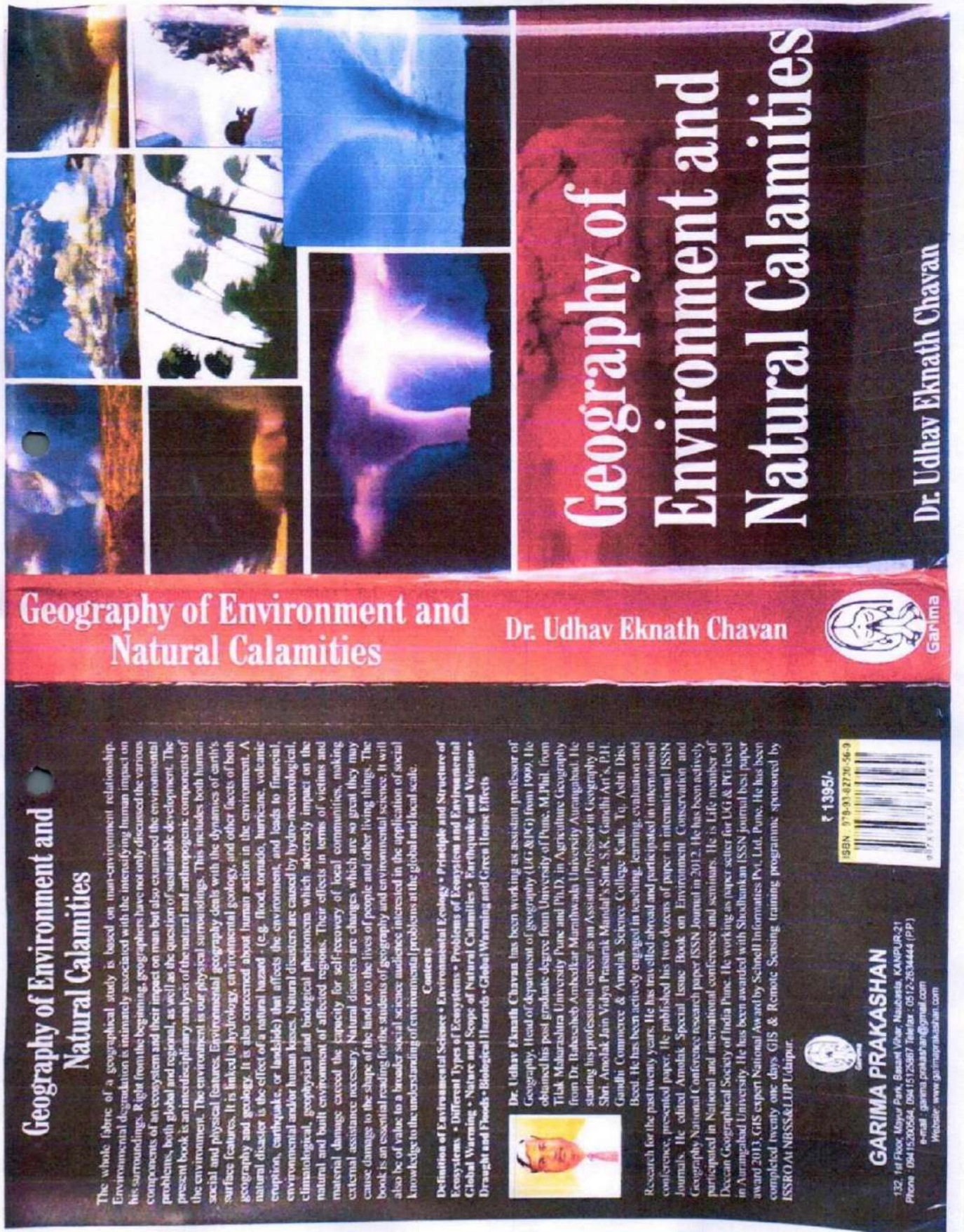
Agro-Tourism

the way of sustainable development

Dr. Ashok Maruti Korade
Mr. Kishor Baburao Dalve



1.3.1 Cross Cutting Issues - Environment and Sustainability Books Published by Faculty



1.3.1 Cross Cutting Issues - Environment and Sustainability Books Published by Faculty

Fundamentals of GIS & Remote Sensing

Dr. Udhav Eknath Chavan

Fundamentals of GIS & Remote Sensing

Dr. Udhav Eknath Chavan



Fundamentals of GIS & Remote Sensing

Geographical Information System (GIS) techniques are being widely used since last two decades, mainly by earth scientists, geologists, geographers, regional planners, environmentalists in the fields of mineral explorations, archaeological excavations, geographical and topographical analysis, terrain studies, urban planning, regional planning, natural resources management, natural disaster management etc. A Geographic Information System combines computer cartography with a database management system. The major components common to a GIS. Remote sensing may be taken to mean the observation of, or gathering information about a target by a device separated from it by some distance. Remote sensing instruments are of two primary types—active and passive. Active sensors provide their own source of energy to illuminate the objects they observe. In satellite remote sensing of the earth, the sensors are looking through a layer of atmosphere separating the sensors from the Earth's surface being observed. The book provides a comprehensive coverage of techniques, applications and technologies of remote sensing and Geographical Information System (GIS). This book should be useful to remote sensing scientists and engineers, geographers, geologists, ecologists and environmental scientists, agricultural and soil scientists.

Contents

- Introduction to GIS • Data Models • Data Visualization • Introduction to GIS Software (Open Source) • Introduction to Remote Sensing • Characteristics of Electromagnetic Radiation (EMR)
- Fundamentals of Aerial Photography • Introduction to Digital Photogrammetry • Basics of Satellite Remote Sensing • Platforms and Orbits • Sensors and Scanning Systems • History of Indian Remote Sensing Program



Dr. Udhav Eknath Chavan has been working as assistant professor of Geography, Head of department of geography (UG & PG) from 1999. He obtained his post graduate degree from University of Pune, M.Phil. from Tilak Maharashtra University Pune and Ph.D. in Agriculture Geography from Dr. Babasaheb Ambedkar Marathwada University Aurangabad. He started his professional career as an Assistant Professor in Geography in Shri. Amolak Jain Vidyya Prasarak Mandal's Smt. S.K. Gandhi Arts, P.H. Ganadhi Commerce & Amolak Science College, Kada, Tq. Ashti Dist. Beed. He has been actively engaged in teaching, learning, evaluation and Research for the past twenty years. He has travelled abroad and participated in international conference, presented paper. He published his two dozens of paper in international ISSN Journals. He edited Amolak Special Issue Book on Environment Conservation and Geography National Conference research paper ISSN Journal in 2012. He has been actively participated in National and international conference and seminars. He is Life member of Deccan Geographical Society of India Pune. He working as paper setter for UG & PG level in Aurangabad University. He has been awarded with Shodhanan ISSN Journal best paper award 2013. GIS expert National Award by Schnell Informatics Pvt. Ltd. Pune. He has been completed twenty one days GIS & Remote Sensing training programme sponsored by ISSRO/ANIBSS & LUP, Ludhara.



GARIMA PRAKASHAN

132, 1st Floor, Mayur Park, Bisaneri Vihar, Noida-201301, U.P.
Phone : 09415200264, 09415125957, Tollfree : 0612-2634444 (P.P.)
e-mail : garima.praakashan@gmail.com
Website : www.garimainfo.com

₹ 1450/-



1.3.1 Cross Cutting Issues - Environment and Sustainability Books Published by Faculty

Role of Biotechnology in Medicinal and Aromatic Plants

Medicine, in several developing countries, using local traditions and beliefs, is still the mainstay of health care. Medicinal plants, since times immemorial, have been used in virtually all cultures as a source of medicine. The widespread use of herbal remedies and health care preparations, as those described in ancient texts such as the Vedas and the Bible, and obtained from commonly used traditional herbs and medicinal plants, has been traced to the occurrence of natural products with medicinal properties. The aromatic plants possess odoriferous and volatile substances which occur as essential oils, gum exudate, balsam and oleoresin in one or more parts, viz. root, wood, bark, foliage, flower and fruit. The chemical nature of these aromatic substances may be due to a variety of complex the chemical compounds. The biotechnological tools are important to select, multiply and conserve the critical genotypes of medicinal plants. In-vitro regeneration holds tremendous potential for the production of high-quality plant-based medicine. India has one of the oldest, richest and most diverse cultural traditions associated with the use of medicinal plants. We also have a vast and inexhaustible resource of drugs of plant origin as nature has provided us with a rich storehouse of herbal remedies to cure all mankind's ailments. Some of them are widely cultivated and others are found in plenty. Medicinal plants have their values in various chemical compounds available in various parts such as leaves, stems, roots, seeds, bark, wood etc. Sensing the importance and antidisease properties of the medicinal and aromatic plants, articles of this book have been compiled to give a clear idea on the subject and also help the medical practitioners to keep abreast of the latest developments.

CONTENTS

Introduction • Micropropagation of medicinal and aromatic plants • Aromatic Plants • Micropropagation and conservation of medicinal plants • Biotechnological investigations in medicinal plants • Role of biotechnology in spices crop improvement • Tissue culture in spice crops • Ayurvedic Medicinal Plants • Role of Plant Biotechnology in Production of Secondary Metabolites • Biotechnological approaches on medicinally Important Species • Cultivation Practices of Medicinal Plants • Role of micropropagation in Conservation of Medicinal Plants • Production of herbal drugs in vitro • Genetic Engineering, Breeding of Aromatic Plants



Prof. Sayyad Innus Gafur- was born in 1st June 1967 at Takali (Kh), tal: Karjat Dist: Ahmednagar (M.S). He is warming as Head Department of Botany science 1996 In Smt. S.K. Gandhi Art's, P.H Gandhi Commerce, And Annalak Science College Kada, Tal: Ashii Dist: Beed (M.S). He has 22 years Teaching experience in the subject of Botany He obtained his M. Phil degree from Allagappa University TamilNadu (T.N). He has contributed more than 15 Research paper in National and International conferences. he worked as program officer in National service scheme he had rich experience of conducting several extension activities in rural and slum area to enhance the capability and skills of the community in relation to their service areas through N. S.S



GAURAV BOOKS

132, IIInd floor, Shivaram Krupa, Mayor Park,
Basant Vihar, Kanpur - 208 008
Ph: 0512-2634444, Fax: 0512-2634444
Mob: 0995224444 / 9415209988
E-mail: gauravbooks55@yahoo.com
website: www.gauravbooks.com

₹ 1350/-

ISBN: 978-93-24139-45-9



9 789324 139459

Role of Biotechnology in Medicinal and Aromatic Plants

Sayyad Innus Gafur

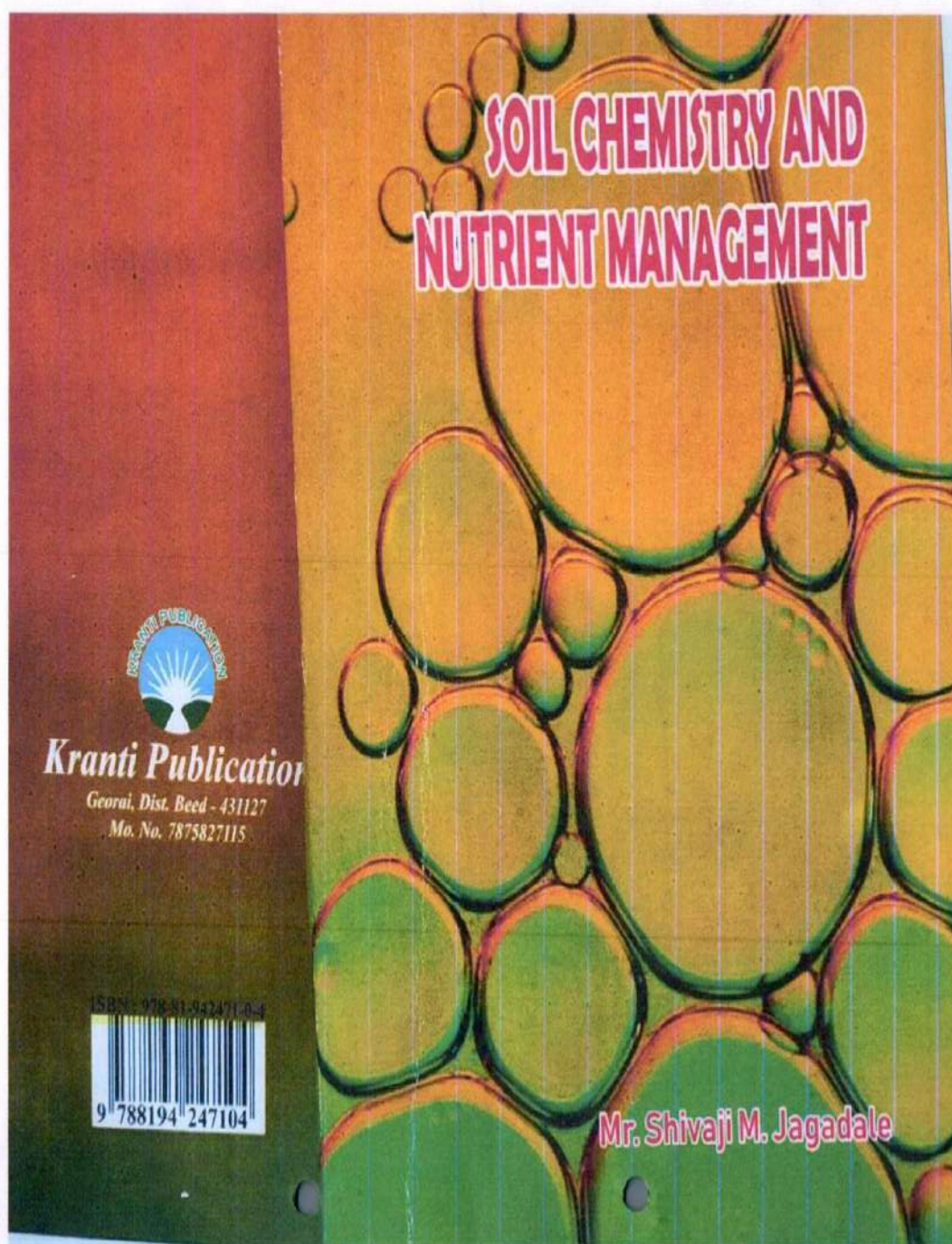


Role of Biotechnology in Medicinal and Aromatic Plants

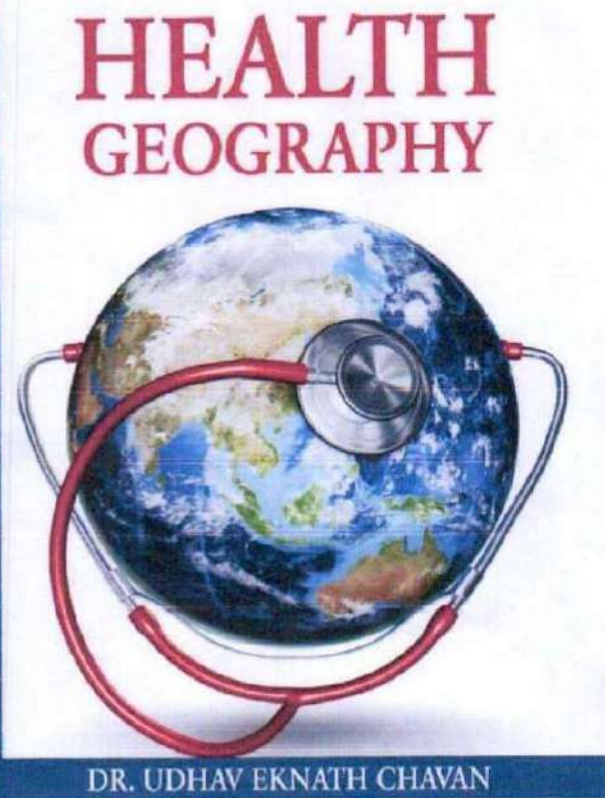
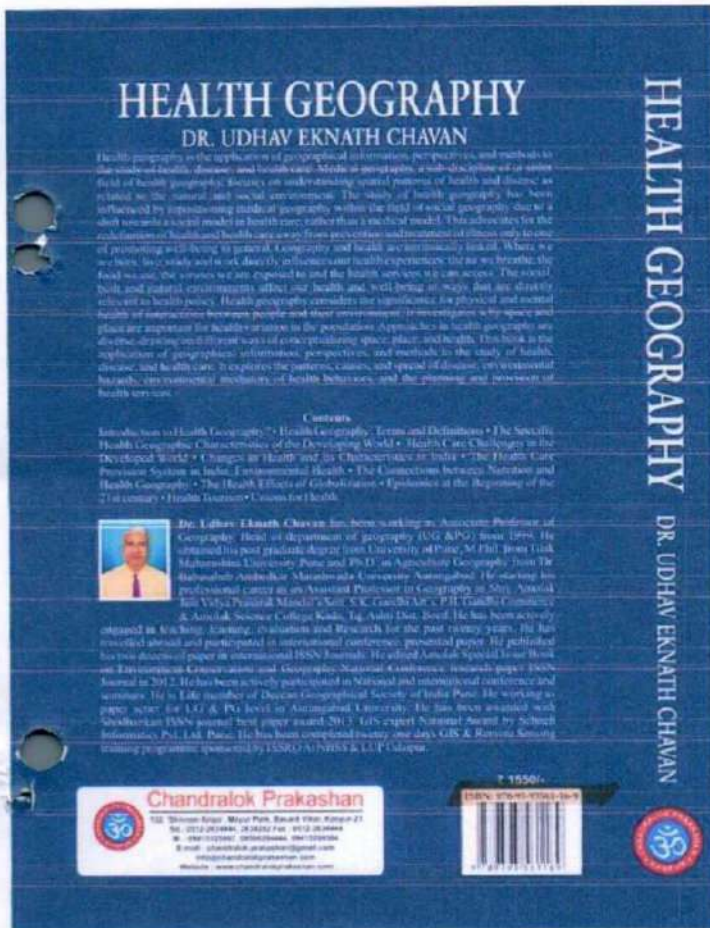
Sayyad Innus Gafur



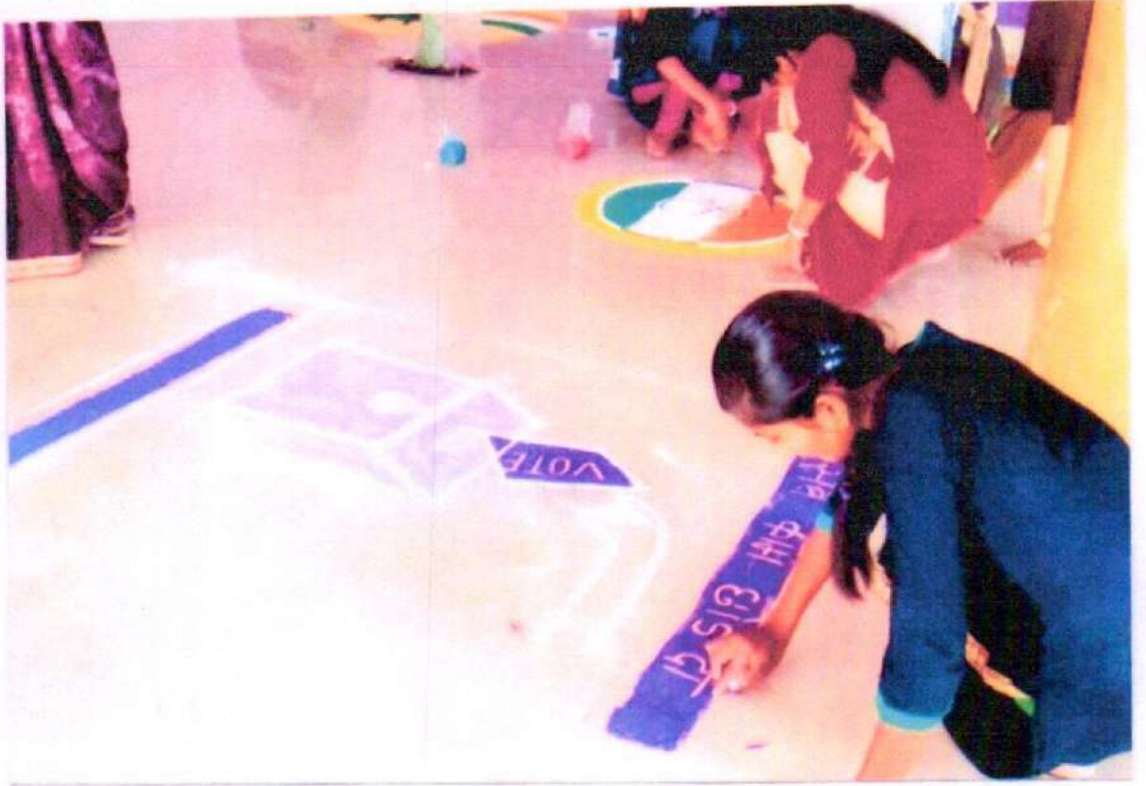
1.3.1 Cross Cutting Issues - Environment and Sustainability
Books Published by Faculty



1.3.1 Cross Cutting Issues - Environment and Sustainability Books Published by Faculty



[Signature]
Principal
Smt. Amalok Jale Vidya Prasarak Mandal's
Shantabai Kantilal Gandhi
Amalok Science, Panalal Hiralal
Gandhi Commerce College
Kada, Tal. Ashli, Dist. Beed



कु. शिवनंदा जाधवर, रांगोळी स्पर्धेमध्ये
सहभाग



कु. स्नेहा माळवे, रांगोळी स्पर्धेमध्ये
सहभाग .

गांधी महाविद्यालयात स्वच्छता ही सेवा कार्यक्रम संपन्न

मध्ये

डॉ. कडा, दि. २९ (प्रतिनिधी) :-
भारत सरकारच्या युवा कार्य व
खेळ मंत्रालय राष्ट्रीय सेवा योजना
क्षेत्रीय कार्यालय पुणे यांच्या
आदेशानुसार कडा येथील गांधी
महाविद्यालयात स्वच्छता अभियान
अंतर्गत राष्ट्रीय सेवा योजनेच्या
वर्धापनदिनानिमित्त स्वच्छता ही
सेवा कार्यक्रम संपन्न झाला.

याप्रसंगी प्र. प्राचार्य डॉ

या एस.एस. पाताळे यांनी विद्यार्थ्यांना
स्वच्छतेची शपथ दिली, तसेच रा
से यो च्या कार्यक्रमाधिकारी प्रा डॉ
अरुणा कुलकर्णी यांनी राष्ट्रीय सेवा
योजनेचे महत्त्व सांगून
वर्धापनदिनाची माहिती दिली. गांधी
महाविद्यालय हे नगर बीड
रस्त्याच्यालगत आहे. नेहमी



रहदारीचा असणारा रस्ता युवकांनी
स्वच्छ केला रस्त्यालगतचा कचरा व
प्लास्टिक गोळा करून त्याची
विल्हेवाट लावण्यात आली.
याप्रसंगी स्वयंसेवकांनी रा से यो
गीत म्हणत स्वच्छता केली. यावेळी
प्राचार्य डॉ एस एस पाताळे, प्रा
अरुणा कुलकर्णी, प्रा धनश्री
मुनोत, प्रा मिरा नाथ, प्रा पी एस

अनारसे, प्रा सय्यद आय जी, प्रा एस
एम शिंदे, प्रा तुकाराम गोंदकर, प्रा
चंद्रशेखर तळेकर, प्रा प्रशांत
मेहेर, प्रा एस आर हासे, प्रा एस एम
जगदाळे, प्रा सुनिता बोंबे, श्री. महेंद्र
पेटकर, श्रीमती टकले
, लोमटे, गावडे, गोंदकर, खिले,
अशोक, खाडे व विद्यार्थ्यांनी
श्रमदान केले.



राष्ट्रीय सेवा योजना स्वच्छता अभियान हेतु
वद्यपिन दिन सातसु करयात आला .



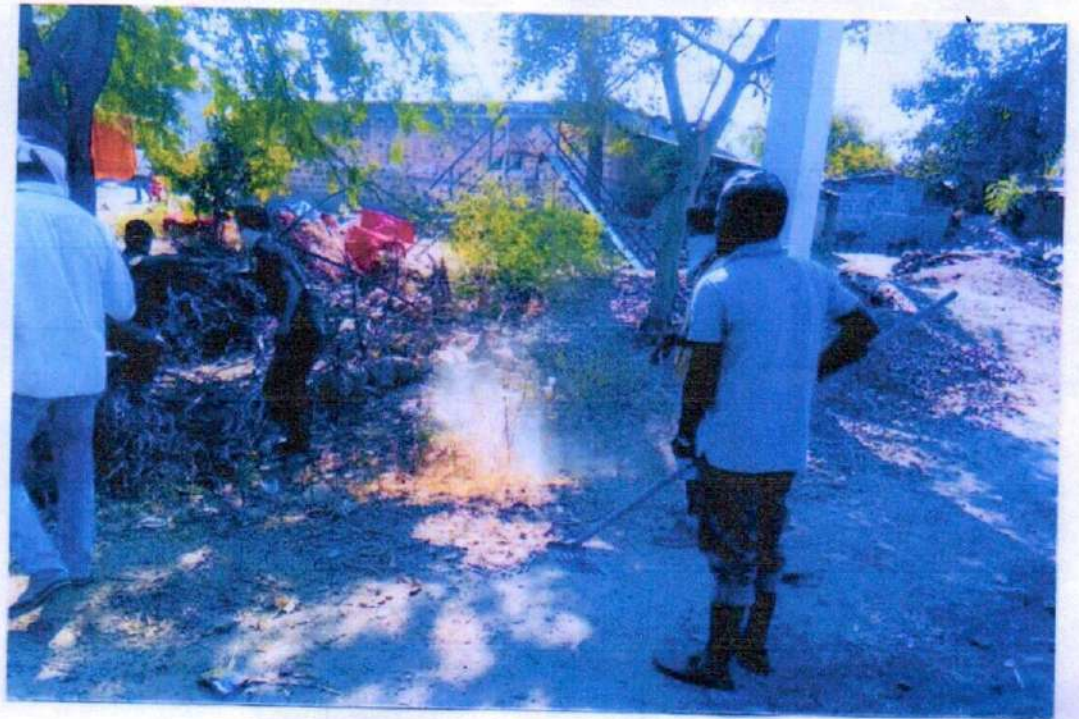
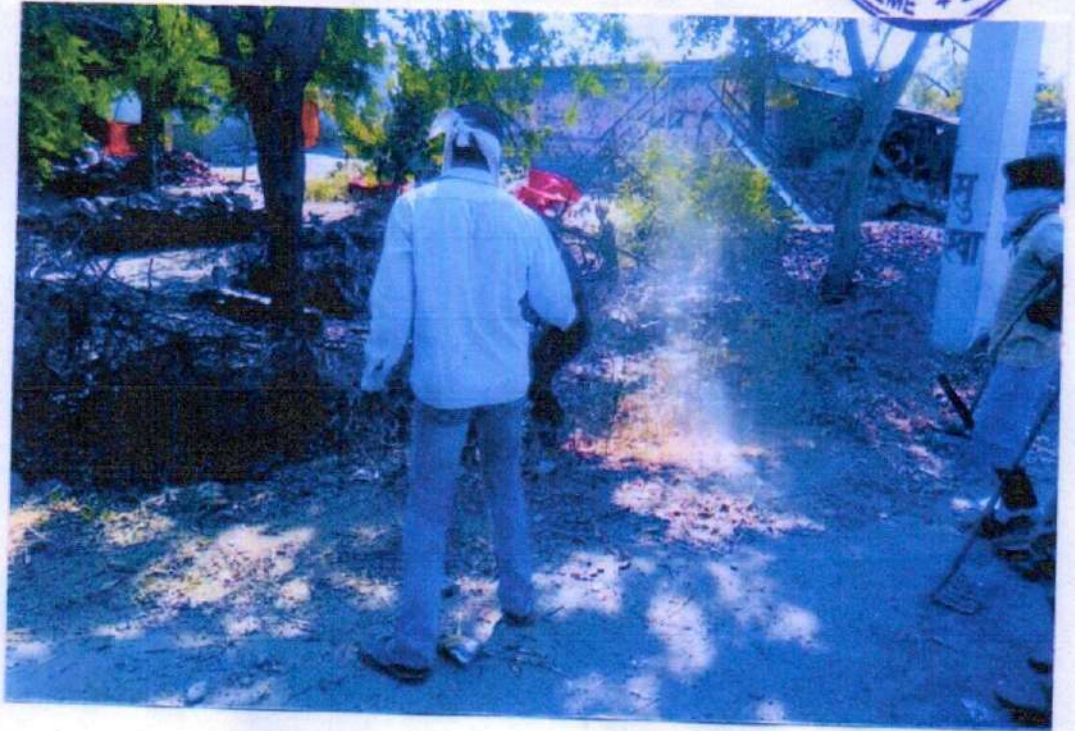
स्वच्छता करताना राष्ट्रीय स्वयंसेवक .



कु. प्रियंका जाधवर , कु. शिवनंदा जाधवर
पथनाथ सादर करतानी.

कु. अनिकेत थोडवे
कु. शिवनंदा जाधवर

कु. प्रियंका जाधवर,
पथनाथ सादर करतानी.



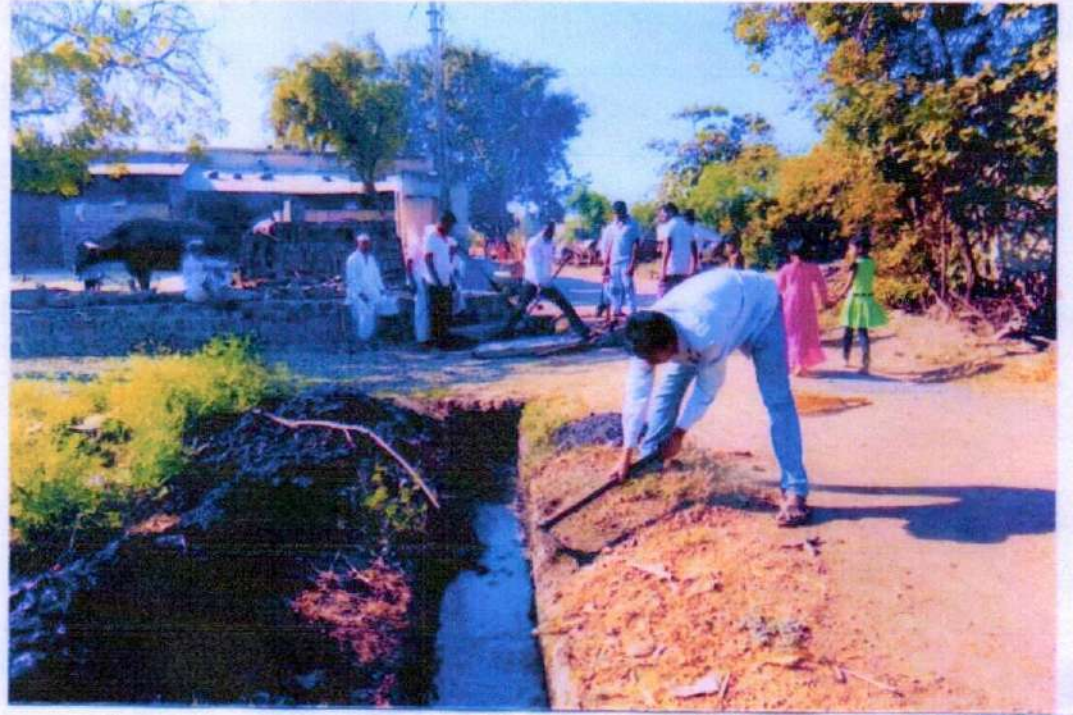
शाळा परिसरातील स्वच्छता करतोना



शाळेच्या मागील वायू स्वच्छ करतोना



ગરારામદિલ્લ ધાન સ્નાફ કરાતો ના શિ કીરાજી



તુંબલેતયા ગરારાલીલ
ધાન કારતોના
સ્વચ્છતેનંતર -



1.3.1 Cross Cutting Issues - Environment and Sustainability Compulsory Environment Course

Regulation 1473-Env.-Comp. compulsory

- 4 -

पर्यावरणशास्त्र अभ्यासक्रमासाठी ई-लर्निंग सुविधा
उपलब्ध करून देणेबाबत

महाराष्ट्र शासन
उच्च व तंत्र शिक्षण विभाग
आदेश क्रमांक एनजीसी २००९/(३९/०९)/मशि ३
मंत्रालय विस्तार भवन, मुंबई ४०० ०३२
दिनांक : २९ ऑगस्ट, २००९



प्रस्तावना:

मा. सर्वोच्च न्यायालयाच्या आदेशानुसार विद्यापीठ अनुदान आयोग, नवी दिल्ली यांनी पर्यावरणशास्त्र हा अभ्यासक्रम देशातील सर्व विद्यापीठांतील पदवी अभ्यासक्रमासाठी अनिवार्य विषय म्हणून लागू करण्याचे आदेश निर्गमित केले आहेत. विद्यापीठ अनुदान आयोगाने पर्यावरण शास्त्र अभ्यासक्रम अनिवार्य केला असला तरी सदर विषयासाठी अनुदान तसेच नवीन पदे मंजूर केलेली नाहीत. हा अभ्यासक्रम सेल्फ लर्निंग सीडीद्वारे व ऑन लाईन पध्दतीने उपलब्ध करून दिल्यामुळे विद्यार्थ्यांना हा विषय प्रचलित पध्दतीने शिकविण्याची गरज राहणार नाही. तसेच विद्यापीठ / महाविद्यालयांना कोणत्याही प्रकारच्या पायाभूत सुविधा उपलब्ध कराव्या लागणार नाहीत.

ई-लर्निंग च्या माध्यमातून सदर अभ्यासक्रम राबविण्याचे फायदे खालील प्रमाणे आहेत:

- १) महाविद्यालयांना हा अभ्यासक्रम शिकविण्यासाठी लागणारा प्रशासकीय / शैक्षणिक वेळ व खर्च वाचेल.
- २) सर्व विद्यार्थ्यांना सारख्याच दर्जाचा अभ्यासक्रम उपलब्ध असेल.
- ३) सदरील अभ्यासक्रमात पर्यावरण, प्रदूषण व सुजाण नागरिकत्व हा मुख्य गाभा असल्यामुळे राज्यातील विद्यार्थ्यांमध्ये पर्यावरण जागृती निर्माण होईल.
- ४) अभ्यासक्रम सीडी / ऑनलाईन स्वरूपात असल्यामुळे गै-ग्रीन या पर्यावरण तत्वांचा अवलंब होईल.
- ५) हा अभ्यासक्रम ई-लर्निंग सीडी द्वारे राबविल्यामुळे पर्यावरण जागृतीला हातभार लागेल.



Dr. R. A. Chaudhary
15/9/09
-R-

शासन निर्णय : लॉयकोस टेक्नॉलॉजी या कंपनी, वाशी, नवी मुंबई यांनी विद्यापीठ अनुदान आयोगाने निर्धारित केलेल्या अभ्यासक्रमानुसार पर्यावरणशास्त्र हा अभ्यासक्रम तयार केला असून तो ई-लर्निंग सुविधेद्वारे उपलब्ध करून देण्याची तयारी दर्शविली आहे. सदर अभ्यासक्रम प्रती वर्ष प्रती विद्यार्थी रु. २००/- इतके शुल्क आकारून उपलब्ध करून देण्याची तयारी कंपनीने दर्शविली आहे.

पर्यावरणशास्त्र हा विषय ई-लर्निंग सुविधेद्वारे शिकविण्याचे फायदे विचारात घेऊन फक्त खालील ५ शासकीय महाविद्यालयांमध्ये सदर विषय ई-लर्निंग सुविधेद्वारे प्रायोगिक स्वरूपात शैक्षणिक वर्ष २००९-१०

Dr. R. A. Chaudhary
15/9/09

Dr. P. K. S. Patil

Dr. R. A. Chaudhary
15/9/09

1.3.1 Cross Cutting Issues - Environment and Sustainability Compulsory Environment Course

Regulation 1473-Env.-Comp, compulsory

- 5 -

करीता सुरु करण्यास लॉयकॉस टेक्नॉलॉजी कंपनी, वाराशी, नवी मुंबई वा कंपनीस खालील अटीवर मान्यता देण्यात येत आहे.

अ.क्र.	संस्थेचे नांव व पत्ता
१	शिडनहॅम वाणिज्य व अर्थशास्त्र महाविद्यालय, मुंबई
२	एलॉफिन्स्टन महाविद्यालय, मुंबई
३	राजाराम महाविद्यालय, कोल्हापूर
४	वसंतराव नाईक कला व समाजविज्ञान संस्था, नागपूर (मॉरीस कॉलेज)
५	शासकीय ज्ञान विज्ञान महाविद्यालय, गडचिरोली

अटी व शर्ती :-

- १) सदर अभ्यासक्रम ई-लर्निंग सुविधेद्वारे राबविल्यामुळे शासनावर कोणत्याही प्रकारचा आर्थिक भार पडणार नाही.
- २) सदर अभ्यासक्रमासाठी प्रती विद्यार्थी निर्धारित केलेल्या रु. २००/- पेक्षा अधिक शुल्काची मागणी संस्था करणार नाही. सदर शुल्क संस्थेस महाविद्यालयामार्फत वसूल करून दिले जाईल.
- ३) वर्षभरात संस्थेची सेवा समाधानकारक न वाटल्यास शुल्क परत घेवून ती बंद करण्यात येईल.
- ४) सदर मान्यता फक्त शैक्षणिक वर्ष २००९-१० करीता देण्यात येत आहे.



(वि. गा. चांदकर)

कार्यासन अधिकारी, महाराष्ट्र शासन

प्रत,

१. कुलसचिव, सर्व संबंधित अकृषी विद्यापीठे
२. संचालक, उच्च शिक्षण, महाराष्ट्र राज्य, पुणे
३. विभागीय सहसंचालक, उच्च शिक्षण, महाराष्ट्र राज्य,
४. सर्व संबंधित शासकीय महाविद्यालये
५. व्यवस्थापक तथा मुख्य कार्यकारी अधिकारी, लॉयकॉस टेक्नॉलॉजी कंपनी, वाराशी, नवी मुंबई ६६,
४ था माला, महावीर सेंटर, सेक्टर १७, वाराशी, नवी मुंबई.
६. निवड नस्ती/मशि-३

**1.3.1 Cross Cutting Issues - Environment and Sustainability
Compulsory Environment Course**

Regulation 1473-Env.-Comp, compulsory

- 18 -

S-CAVER PAGE WITH PRICE

- 34 -

Fac. of Science 31-08-2005
14(7) - 01-09-2005

**DR. BABASAHEB AMBEDKAR
MARATHWADA UNIVERSITY,
AURANGABAD.**



**SYLLABUS OF
"Six Months Course in
Environmental Science"**

(As per directives of Hon'ble Supreme Court)

[EFFECTIVE FROM 2005-06 AND ONWARDS]

1.3.1 Cross Cutting Issues - *Environment and Sustainability* Compulsory Environment Course

Regulation 1473-Env.-Comp, compulsory

- 19 -

G-Envir-Sci

- 9 -

SIX MONTHS COMPULSORY CORE MODULE COURSE IN ENVIRONMENTAL STUDIES: FOR UNDERGRADUATES

Teaching Methodologies

The Core Module Syllabus for Environmental Studies includes class room teaching and Field Work. The syllabus is divided into eight units covering 100 lectures. The first seven units will cover 70 lectures which are class room based to enhance knowledge skills and attitude to environment. Unit eight is based on field activities which will be covered in 30 lecture hours and would provide students first hand knowledge on various local environmental aspects. Field experience is one of the most effective learning tools for environmental concerns. This moves out of the scope of the text book mode of teaching into the realm of real learning in the field, where the teacher merely acts as a catalyst to interpret what the student observes or discovers in his/her own environment. Field studies are as essential as class work and form an irreplaceable synergistic tool in the entire learning process.

Course material provided by UGC for class room teaching and field activities be utilized.

The universities/colleges can also draw upon expertise of outside resource persons for teaching purposes.

Environmental Core Module shall be integrated into the teaching programmes of all undergraduate courses.

1.3.1 Cross Cutting Issues - *Environment and Sustainability* Compulsory Environment Course

Regulation 1473-Env.-Comp, compulsory

- 20 -

G-Envir-Sci

Annual System: The duration of the course will be 100 lectures. The exam will be conducted along with the Annual Examination.

Semester System: The Environment course of 100 lectures will be conducted in the second semester and the examination shall be conducted at the end of the second semester.

Credit system: The core course will be awarded 4 credits.

Exam Pattern: In case of awarding the marks, the question paper should carry 100 marks. The structure of the question paper being:

Part-A, Short answer pattern	-	25 marks
Part-B, Essay type with inbuilt choice	-	50 marks
Part-C, Field Work	-	25 marks

1.3.1 Cross Cutting Issues - *Environment and Sustainability* Compulsory Environment Course

Regulation 1473-Env.-Comp, compulsory

G-Envir-Sci

- 21 -

CORE MODULE SYLLABUS FOR ENVIRONMENTAL STUDIES FOR UNDER GRADUATE COURSES OF ALL BRANCHES OF HIGHER EDUCATION.

UNIT 1: The Multidisciplinary nature of environmental studies

Definition, scope and importance

(2 lectures)

Need for public awareness.

UNIT 2: Natural Resources:

Renewable and non- renewable resources:

Natural resources and associated problems.

- a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- b) Water resources: Use and over-utilization of surface and ground water; floods, drought, conflicts over water, dams benefits and problems.
- c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

1.3.1 Cross Cutting Issues - *Environment and Sustainability* Compulsory Environment Course

Regulation 1473-Env.-Comp. compulsory

- 22 -

G-Envir-Sci

- 5 -

- e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
 - f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
- Role of an individual in conservation of natural resources.
 - Equitable use of resources for sustainable lifestyles.

UNIT 3 : Ecosystems

- Concept of an ecosystem.
 - Structure and function of an ecosystem.
 - Producers, consumers and decomposers.
 - Energy flow in the ecosystem.
 - Food chains, food webs and ecological pyramids.
 - Ecological succession.
 - Introduction, types, characteristic features, structure and function of the following ecosystem:-
- a) Forest ecosystem.
 - b) Grassland ecosystem.
 - c) Desert ecosystem.
 - d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

1.3.1 Cross Cutting Issues - *Environment and Sustainability* Compulsory Environment Course

Regulation 1473-Env.-Comp, compulsory

- 23 -

G-Envir-Sci

- 6 -

UNIT 4: Biodiversity and its conservation.

- Introduction – Definition: genetic, species and ecosystem diversity.
- Biogeographical classification of India.
- India as a mega-diversity nation.
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
- Biodiversity at global, National and local levels.
- Hot-spots of biodiversity.
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT 5: Environmental Pollution

Definition

- Causes, effects and control measures of :-
 - a) Air pollution
 - b) Soil pollution
 - c) Water pollution
 - d) Marine pollution
 - e) Noise pollution
 - f) Thermal pollution
 - g) Nuclear hazards

1.3.1 Cross Cutting Issues - *Environment and Sustainability* Compulsory Environment Course

Regulation 1473-Env.-Comp, compulsory

- 24 -

G-Envir-Sci

- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management: floods, earthquake, cyclone and landslides.

(8 lectures)

UNIT 6: Social Issues and the Environment.

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and Control of Pollution) Act.
- Wild life Protection Act.
- Issues involved in enforcement of environmental legislation.
- Public awareness.

UNIT 7: Human Population and the Environment.

- Population growth, variation among nations.
- Population explosion-family welfare programme.

1.3.1 Cross Cutting Issues - *Environment and Sustainability* Compulsory Environment Course

Regulation 1473-Env.-Comp, compulsory

- 25 -

G-Envir-Sci

- Human Rights.
- Value Education.
- Environment and human health.
- HIV/AIDS.
- Women and Child Welfare.
- Role of Information Technology in Environment and human health.
- Case Studies.

(6 lectures)

UNIT 8: Field work

- Visit to a local area to document environmental assets-
river/forest/grassland/hill/mountain.

REPORT COMPULSORY

- Visit to a local polluted sites – Urban Rural / Industrial /
Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystem – pond, river, hill slopes, etc.

(Field work Equal to 5 lecture hours)

1.3.1 Cross Cutting Issues - *Environment and Sustainability* Compulsory Environment Course

Regulation 1473-Env.-Comp, compulsory

- 26 -

G-Envir-Sci

- 11 -

REFERENCES

1. Agarwal, K. C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad-380013, India, Email: mapin@icent.net (R)
3. Bruneer R. C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p.
4. Clark R. S., Marine Pollution, Clarendon Press Oxford (TB)
5. Cunningham, W. P. Cooper, T. H. Gorhani, E & Hepworth, M. T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
6. De A. K., Environmental Chemistry, Wiley Eastern Ltd.
7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H. P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute. Oxford Univ. Press. 437p
9. Hawkins R. E., Encyclopædia of Indian Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V. H. & Watson, R. T. 1995. Global Biodiversity Assessment. Cambridge University Press 114p
11. Jadhav, H & Bhosale, V. M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284p
12. Mckinney, M. L. & Schoel. R. M. 1996 Environmental Science systems & Solution, Web enhanced edition. 639p
13. Mhaskar A. K, Matter Hazardous, Techno-Science Publications (TB).

1.3.1 Cross Cutting Issues - *Environment and Sustainability* Compulsory Environment Course

Regulation 1473-Env.-Comp, compulsory

- 27 -

- G-Envir-Sci
14. Miller T. G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
15. Odum, E. P. 1971. Fundamentals of Ecology. W. B. Saunders Co. USA, 574p.
16. Rao M: N. & Datta, A. K. 1987. Waste Water treatment: Oxford & IBH Publ. Co. Pvt. Ltd. 345p.
17. Sharma B. K., 2001. Environmental Chemistry. Goel Publ. House, Meerut
18. Survey of the Environment, The Hindu (M)
19. Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
20. Trivedi R. K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol I and II, Enviro Media (R)
21. Trivedi R. K. and P. K. Goel, Introduction to air pollution, Techno-Science Publications (TB)
22. Wagner K. D., 1998. Environmental Management. W. B. Saunders Co. Philadelphia, USA 499p
- (M) Magazine
(R) Reference
(TB) Textbook