Late Chindhuji Laxmanrao Purke Shikshan Prasarak Mandal's

INDIRA GANDHI KALA MAHAVIDYALAYA

Ralegaon, Dist- Yavatmal,Maharashtra

Affiliated to

Sant Gadge Baba Amravati University, Amravati

2nd Cycle

Assessment& Accreditation by NAAC

Criterion-III

Research, Innovations and Extension

Q_nM 3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years

Late ChindhujiLaxmanraoPurkeShikshanPrasarakMandal's Yavatmal

GANDHI KALA MAHAVIDYALAYA, RALEGAON
DIST. –YAVATMAL (445402)

(Affiliated to Sant Gadge Baba Amravati University College Code-490)
(DD Code - 06610100121)

President
Hon' Prof. Shri Vasantrao C. Purke
Mob No. – 9920997275

Website-www.igkmralegaon.org
E-mail - igkm490@gmail.com

Principal
Dr. Santosh V. Agarkar
Mob. No-9373778210

Dis. No. :–

Date :–17/07/2024

Declaration

The information, reports, true copies of the supporting documents, numerical data, etc. related to the NAAC process furnished in this file is verified by IQAC and found correct. Hence this certificate.

Co-ordinator
Internal Quality Assurance Cell
Indira Gandhi Kala Mahavidyalaya
Ralegaon

Gandhi Kala Mahavidyalaya College Code 490

PRINCIPAL
Indira Gandhi Kala Mahavidyalaya
Ralegeon Dist.Yavatmal

CONTENT

Late Chindhuji Laxmanrao Purke Shikshan Prasarak Mandal's

Indira Gandhi Kala Mahavidyalaya,

Ralegaon - 445402, Dist. Yavatmal (M.S.)

Affiliated to Sant Gadge Baba Amravati University

Website -www.igkmralegaon.org **E-mail - igkm490@gmail.com**

Books, Chapter, Paper Published in Conference

From 2019-20 to 2023-24

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Calendar Year of publication	ISBN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
2023-24										
1	Dr.S.D.Dawada	A Text Book Of Zoology, Cell Biology and Developmental Biology				National	2023	19435-80-7	I.G.K.M.,Ralegaon	DnyanPath Publication
2	Dr.S.D.Dawada	Study On Planton Biodiversity With Respect To Fish Production In		Multidisciplinary approach to higher education		National	2023	978-81-972505-0-7	I.G.K.M.,Ralegaon	DnyanPath Publication

		Borgaon Dam Yavatmal Taluka Yavatmal District Maharashtra State India								
3	Mr. A.C. Ade	A text book of Zoology B.Sc II sem III				National	2023	978-93-93940-21-6	I.G.K.M.,Ralegaon	Nabha prakashan
4	Ms. B.K. Lohakar	Concept of gene				National	2023	978-93-93940-38-4	I.G.K.M.,Ralegaon	Nabha prakashan
5	Mr.V.D. Samarth	Climate Change and Impact on Agriculture	A Multidisciplinary Approach to Higher Education Volume - II			National	2024	978-81-972505-0-7	I.G.K.M.,Ralegaon	DnyanPath Publication
6	Mr. N. M. Deshmukh	Climate Change and Impact on Agriculture	A Multidisciplinary Approach to Higher Education Volume - II			National	2024	978-81-972505-0-7	I.G.K.M.,Ralegaon	DnyanPath Publication
7	Mr.M.V.Wankhade	Textbook of Angiosperm Systematic, Anatomy and Embryology				National	2024	978-8119435-95-1	I.G.K.M.,Ralegaon	DnyanPath Publication
8	Mr. B.H.Bhatti	Photovoltaic applications of			UGC Sponsored National Conference on Recent	National	2024	978-81-19931-25-5	I.G.K.M.,Ralegaon	

		SnO2 gas sensor			Advancements in Science and Technology					
9	Mr.B.H.Bhatti		Humidity Sensors: $AlCl_2$-Dipped Nanocrystalline Magnesium Oxide		UGC Sponsored National Conference on Recent Advancements in Science and Technology	National	2024	978-81-19931-25-5	I.G.K.M.,Ralegaon	
10	Mr. B.H.Bhatti		Advances and Perspectives in Nanotechnology: A Short Review		UGC Sponsored National Conference on Recent Advancements in Science and Technology	National	2024	978-81-19931-25-5	I.G.K.M.,Ralegaon	
11	Mr. A. S. Lihitkar	Emerging interdicipliinary areas of Physics in Higher Education and Job Opportunities				National	2024	978-81-972505-6-9	I.G.K.M.,Ralegaon	
12	Dr. A.Y.Shaikh	Dynamic Analysis of Renyi Holographic Dark Energy with Hubble's IR Cut-off			Recent Advancements in Science and Technology	National	2024	978-81-19931-25-5	I.G.K.M.,Ralegaon	VidyaBharati Mahavidyalaya , Amravati
13	Dr. A.Y.Shaikh	Exploration of Barrow Holographic Dark Energy in Modified			Recent Advancements in Science and Technology	National	2024	978-81-19931-25-5	I.G.K.M.,Ralegaon	VidyaBharati Mahavidyalaya , Amravati

		Theory of Gravitation								
14	Mr.S.V.Gore	Exploration of Barrow Holographic Dark Energy in Modified Theory of Gravitation			Recent Advancements in Science and Technology	National	2024	978-81-19931-25-5	I.G.K.M.,Ralegaon	VidyaBharati Mahavidyalaya , Amravati
15	Dr.A.Y.Shaikh	Panoramic Behaviour of Magnetized Strange Quark Matter in Modified Theory of Gravitation			Recent Advancements in Science and Technology	National	2024	978-81-19931-25-5	I.G.K.M.,Ralegaon	VidyaBharati Mahavidyalaya , Amravati
16	Dr. A.Y.Shaikh	Accelerating Magnetized Strange Quark Cosmological model for Bianchi type I (Kasner metric) in modified gravity			Emerging Trends in Computational Science and Technology	National	2024	978-81-19435-61-6	I.G.K.M.,Ralegaon	Shri Shivaji Science College , Amravati
17	Dr. A.Y.Shaikh	Dynamic Analysis of Renyi Holograph			Emerging Trends in Computational Science and Technology	National	2024	978-81-19435-61-6	I.G.K.M.,Ralegaon	Shri Shivaji Science College , Amravati

		ic Dark Energy								
18	Dr. A.Y.Shaikh	Holographic Dark Energy Model by Sharma andMittal with Bouncing Scenario			Emerging Trends in Computational Science and Technology	National	2024	978-81-19435-61-6	I.G.K.M.,Ralegaon	Shri Shivaji Science College , Amravati
19	Dr. A.Y.Shaikh	Introduction to Cosmology				International	2024	978-620-748606-9	I.G.K.M.,Ralegaon	Lambert Academic Publishing
20	Dr. V.L. Barde	A Multidisciplinary Approach to Higher Education	New Education Policy (NEP-2020) and Role of Academic Libraries			National	2024	978-81-972505-6-9	I.G.K.M.,Ralegaon	
21	Mr. Y. I. Biradar	Modern Emerging Trends In Chemical Sciences	UV- Visible Spectroscopy: Basic Concepts			National	2024	978-93-94766-90-7	I.G.K.M.,Ralegaon	
22	Dr.K.G. Pawar	A mulitidisciplinary approach to higher education	Nutritional requirements if athletes and pre and post match diet			National	2024	978-81-972505-6-9	I.G.K.M.,Ralegaon	DnyanPath Publication
2022-23										
1	Dr. V.L. Barde		National Education Policy 2020: Impact on the Library pp1-8	International Conference on Multidiscipl	International Conference on Multi-disciplinary Research and studies ,	International	2023	E-ISSN: 2582-2160	I.G.K.M.,Ralegaon	International Conference on Multidisciplinary

				inary Research & Studies 2023	organized by SPM Science & Gilani Arts, Commerce College , Ghatanji on 21st Jan 2023					Research & Studies 2023
2	Mr.A.C.Ade	Effect of glyphosate based herbicide on developme nt of earthworm	Effect of glyphosate based herbicide on development of earthworm				2022	2319-4979	I.G.K.M.,Ral egaon	
3	Dr. V.L. Barde	Future of Academic Libraries and Library	-	Conference Proceedings Seventy Five Years of Indian Library Profession	'Seventy - Five Years of Indian Library Profession' NATIONAL CONFERENCE OF INDIAN LIBRARY ASSOCIATION, NEW DELHI AND MAHARASHTR A UNIVERSITY AND COLLEGE LIBRARIANS ASSOCIATION	National	2023	978-81-19118-22-9	I.G.K.M.,Ral egaon	Atharva Publications
4	Dr. S.D.Dawada	Cell biology and Devlopme ntal Biology					2023		I.G.K.M.,Ral egaon	
5	Dr. K.G.Pawar	Physical education and sports issue , challenges	Impact of advanced training using technology after				2023	978-81-19435-00-5	I.G.K.M.,Ral egaon	Dynapath Publication

		and oppurnitie s	pandamic							
6	Dr. K.G.Pawar	Higher education issue , challenges and oppurnitie s	Recent advances in education technology				2023	978-81-19435-01-2	I.G.K.M.,Ral egaon	Dynapath Publication
7	Mr.S.V. Jadhav	Hand book of B.Sc.First year Course in Chemistry Sem-I &II	All Physical chemistry Practical	-	-	National	2022	ISBN 978-81-933884-1-9	I.G.K.M.,Ral egaon	DnyanPath Publication
8	Mr.S.V.Jadhav			National Multidisciplinary Research e-Conference	National Multidisciplinary Research e-Conference	National	2022		I.G.K.M.,Ral egaon	
9	Mr.S.V.Jadhav			Role of Chemical Scinces in Sustainable Developme nt	One Day National Conference on Role of Chemical Scinces in Sustainable Development	National	2022		I.G.K.M.,Ral egaon	
10	Mr.S.V.Jadhav			Interdisciplinary approaches in Chemical and Allied Sciences.	Two Day National Conference on Interdisciplinary approaches in Chemical and Allied Sciences.	National	2023		I.G.K.M.,Ral egaon	
11	Mr. P. R. Jagnit	Innovative Scientific, Bussiness and Social Practices for	Environment and Strategies for Sustainable Development	--	--	Internatio nal	2023	978-93-85882-65-4	I.G.K.M.,Ral egaon	Harshwardha n Punblication Pvt. Ltd.

		Sustainable Development								
12	Mr. P. R. Jagnit		Challenges and Opportunities for Online Education in India		International Conference on Multidisciplinary Research & Studies 2023 (ICMRS23)	International	2023		I.G.K.M.,Ralegaon	
13	Mr. P. R. Jagnit		Thermal Studies of Co(II), Ni(II) and Cu(II) Complexes Derived from Thiazole Schiff Base with Microwave Irradiation Method		International Multidisciplinary Conference on Environment: Issues, Challenges, Impact & Steps Toward Sustainable Development(ICESD22)	International	2023		I.G.K.M.,Ralegaon	
14	Mr.S.V.Gore	Introductory to Linear Algebra				National	2023	978-81-88763-30-6	I.G.K.M.,Ralegaon	Sonu Nilu Publication
15	Mr.K.D.Jagtap	Text Book of B.Sc. First Year Course in Physics				National	2023	978-93-94661-66-0	I.G.K.M.,Ralegaon	DnyanPath Publication
16	Mr.V.D. Samarth	Innovative Scientific, Business and Social Practices for Sustainable Developm	Environment and strategies for sustainable development			International	2023	978-93-85882-65-4	I.G.K.M.,Ralegaon	Harshwardhan Punblication Pvt. Ltd.

		ent								
17	Mr.N.M.Deshmukh	Innovative Scientific, Business and Social Practices for Sustainable Development	Environment and strategies for sustainable development			International	2023	978-93-85882-65-4	I.G.K.M.,Ralegaon	Harshwardhan Punblication Pvt. Ltd.
18	Mr.V.D. Samarth		Ethnobotanical and Phytochemical study of member cucurbitaceae from Ralegaon Region- A Review		International Conference on Multidisciplinary Research & Studies	International	2023	E-ISSN: 2582-2160	I.G.K.M.,Ralegaon	International Journal for Multidisciplinary Research
19	Mr.N.M.Deshmukh		Ethnobotanical and Phytochemical study of member cucurbitaceae from Ralegaon Region- A Review		International Conference on Multidisciplinary Research & Studies	International	2023	E-ISSN: 2582-2160	I.G.K.M.,Ralegaon	International Journal for Multidisciplinary Research
2021-22										
1	Dr.A.Y.Shaikh	Impact of Covid-19 Pandemic on Education and				International	2022	978-93-81247-80-8	I.G.K.M.,Ralegaon	Shriyanshi Prakashan

		Students in India								
2	Dr.A.Y.Shaikh	Impact of ICT in Teaching, Learning and Evalution Process				National	2021	978-93-85882-33-4	I.G.K.M.,Ralegaon	Harshwardhan Publication. Pvt. Ltd.
3	Dr. S. D. Dawda	Genetics				National	2021	978-93-5453-478-2	I.G.K.M.,Ralegaon	Vikas Publication House Pvt. Ltd.
4	Dr. V. L. Barde	Impact of Covid-19 Pandemic on Education and Students in India				International	2022	978-93-81247-80-8	I.G.K.M.,Ralegaon	Shriyanshi Prakashan
5	Dr. K. G. Pawar		Maturity level among the inter college level high and low performing Kabaddi Players			International	2021	ISSN 2231-3265	I.G.K.M.,Ralegaon	Indian Federation of Computer Science in Sports
6	Mr.V.D.Samrath	Environmental studies				National	2021	978-93-91331-71-9	I.G.K.M.,Ralegaon	DnyanPath Publication
7	Mr.V.D.Samrath	Chemistry And Biological Activities of Quercetin : A Bioactive Flavonoid				International	2022	E-ISSN : 2348-7143	I.G.K.M.,Ralegaon	RESEARCH JOURNEY
8	Mr.V.D.Samrath	Biodiversi				Internatio	2021	ISSN:	I.G.K.M.,Ral	IRJSE

		ty: Concept, Threat and Conservation				nal		2322-0015	egaon	
9	Mr.S.V.Jadhav	Impact of ICT in Teaching, Learning and Evalution Process				International	2021	978-93-85882-33-4	I.G.K.M.,Ralegaon	Harshwardhan Publication. Pvt. Ltd.
10	Mr.S.V.Jadhav	Study of Water Quality Parameters of Pimpalkhuti Dam in Taluka Ralegaon, District-Yavatmal				International	2022	ISSN 2349-638x	I.G.K.M.,Ralegaon	Aayushi International Interdisciplinary Research Journal
11	Mr.S.V.Gore	Impact of Covid-19 Pandemic on Education and Students in India				International	2022	978-93-81247-80-8	I.G.K.M.,Ralegaon	Shriyanshi Prakashan
12	Mr.K.D.Jagtap	Current Trends In Higher Education/ Role of Social Media on Higher Education				National	2022	ISBN: 978-93-91331-34-4	I.G.K.M.,Ralegaon	DnyanPath Publication
13	Mr.P.R.Jagnit		“Thermokinetic Studies of			International	2022	ISSN 2349-	I.G.K.M.,Ralegaon	Aayushi International

			Cr(III), Mn(III), and Fe(III) Complexes from thiazole Schiff base”					638x		Interdisciplinary Research Journal
14	Mr.P.R.Jagnit		Study of Water Quality Parameters of Pimpalkhuti Dam in Taluka Ralegaon, District-Yavatmal			International	2022	ISSN 2349-638x	I.G.K.M.,Ralegaon	Aayushi International Interdisciplinary Research Journal
15	Mr. P.R.Jagnit		Thermokinetics studies of Co(II), Ni(II), and Cu(II) with tetradentate Schiff base		National E-Conference on "Role of Chemical Sciences in Sustainable Development"	National	2022	ISSN: 2319 9318	I.G.K.M.,Ralegaon	Vidyawarta Peer-Reviewed International Journal
16	Mr.A.C.Ade		Biodiversity: Concept, Threat and Conservation			International	2021	ISSN: 2322-0015	I.G.K.M.,Ralegaon	IRJSE
17	Mr.A.S.Lihitkar	Impact of ICT in Teaching, Learning and Evalution Process				National	2021	978-93-85882-33-4	I.G.K.M.,Ralegaon	Harshwardhan Publication. Pvt. Ltd.
18	Mr.A.S.Lihitkar	Current Trends In Higher Education/ Role of Social Media on Higher Education				National	2022	ISBN: 978-93-91331-34-4	I.G.K.M.,Ralegaon	DnyanPath Publication

19	Mr.B.H.Bhatti	Impact of ICT in Teaching, Learning and Evalution Process				National	2021	978-93-85882-33-4	I.G.K.M.,Ralegaon	Harshwardhan Publication. Pvt. Ltd.
20	Ms. S. S. Dhage		Nutrition of Infants		World Conference on Startup in India and Education with Placement in Abroad	Internatio nal	2022	ISSN 2278-7984	I.G.K.M.,Ralegaon	Scholars Vision and Abasaheb Parvekar Mahavidyalaya, Yavatmal
21	Dr. Santosh Agarkar	Fundamental concept of Chromatography				Internatio nal	2022	978-62-04210-08-7	I.G.K.M.,Ralegaon	Lambert Academic Publishing
22	Dr.S.D.Dawada		Basics of Genetic Engineering and application in Recent Era		Resent research at the Intersection of Science & technology	National	2022		I.G.K.M.,Ralegaon	
2020-21										
1	Dr. A. Y. Shaikh	Innovative Research Trends in Science and Humanities	Paranoma Scenario of Resent Trends in Science and Technology			National	2021	978-1-95446-44-4	I.G.K.M.,Ralegaon	INSC Publishing House
2	Dr. S. D. Dawda	Innovative Research Trends in Science and Humanities	Evalution of Abortifacient Activity of Some Tribal Folklore Medicinal Plants in			National	2021	978-1-95446-44-4	I.G.K.M.,Ralegaon	INSC Publishing House

			Female Albino Rats							
3	Dr. K. G. Pawar	Innovative Research Trends in Science and Humanities	Technolgy and Innovations in Sports			National	2021	978-1-95446-44-4	I.G.K.M.,Ralegaon	INSC Publishing House
4	Mr. V. D. Samarth	Innovative Research Trends in Science and Humanities	Paranoma Scenario of Resent Trends in Science and Technology			National	2021	978-1-95446-44-4	I.G.K.M.,Ralegaon	INSC Publishing House
5	Mr. S. V. Jadhav	Innovative Research Trends in Science and Humanities	Paranoma Scenario of Resent Trends in Science and Technology			National	2021	978-1-95446-44-4	I.G.K.M.,Ralegaon	INSC Publishing House
6	Mr.K. D. Jagtap	Innovative Research Trends in Science and Humanities	Innovation in Science and Technolgy to Achieve Sustainable Development Goals			National	2021	978-1-95446-44-4	I.G.K.M.,Ralegaon	INSC Publishing House
7	Mr. K. D. Jagtap	Innovative Research Trends in Science and Humanities	Paranoma Scenario of Resent Trends in Science and Technology			National	2021	978-1-95446-44-4	I.G.K.M.,Ralegaon	INSC Publishing House
8	Mr.P. R. Jagnit	Innovative Research Trends in Science and	Paranoma Scenario of Resent Trends in Science and			National	2021	978-1-95446-44-4	I.G.K.M.,Ralegaon	INSC Publishing House

		Humanities	Technology							
9	Mr.A. C. Ade	Innovative Research Trends in Science and Humanities	Paranoma Scenario of Resent Trends in Science and Technology			National	2021	978-1-95446-44-4	I.G.K.M.,Ralegaon	INSC Publishing House
10	Mr.A. S. Lihitkar	Innovative Research Trends in Science and Humanities	Innovation in Science and Technolgy to Achieve Sustainable Development Goals			National	2021	978-1-95446-44-4	I.G.K.M.,Ralegaon	INSC Publishing House
11	Mr.B. H. Bhatti	Innovative Research Trends in Science and Humanities	Innovation in Science and Technolgy to Achieve Sustainable Development Goals			National	2021	978-1-95446-44-4	I.G.K.M.,Ralegaon	INSC Publishing House
12	Mr. K.D.Jagtap	Text Book of Physics ,Optics , Laser and Renewable source of energy	Fiber Optics			National	2021	978-93-91201-7-1-5	I.G.K.M.,Ralegaon	Sai Jyoti Publication
13	Dr.A.Y.Shaikh	Introduction to Graph Theory	Introduction to Graph Theory , Volume I			National	2021	978-81-947250-6-0	I.G.K.M.,Ralegaon	DnyanPath Publication
14	Dr. Santosh Agarkar	Fundamental of solid waste management				International	2020	978-620-2-52934-1	I.G.K.M.,Ralegaon	Lambert Academic Publishing
15	Mr.B. H. Bhatti		Metal Oxide Semiconductor Gas Sensor		National e-Conference on Recent Trends in	National	2020		I.G.K.M.,Ralegaon	

			SnO_2 and its application- A review		Physical Sciences (NCRTPS-21)					
16	Mr.A.S.Lihitkar		A review of Recent Trends in Radiation Detector		National e-Conference on Recent Trends in Physical Sciences (NCRTPS-21)	National	2020		I.G.K.M.,Ralegaon	
17	Mr.A. C. Ade	MCQ's in Zoology For B.Sc., Second Year, Semester - III				National	2020	978-93-91331-14-6	I.G.K.M.,Ralegaon	
18	Mr.A. C. Ade	MCQ's in Zoology For B.Sc., First Year, Semester - I				National	2020	978-93-91331-13-9	I.G.K.M.,Ralegaon	
2019-20										
1	Mr. Pawan R. Jagnit		Electrical Conductivity of Co(II),Ni(II), Cu(II) and Cr(III) Complex derived from thiazole Schiff base.		National Conference on Multidisciplinary Reseach in Science and Technology for Healthy Lifestyle Management (NCMRST-2020)	National	2020		I.G.K.M.,Ralegaon	
2	Mr. Pawan R. Jagnit		Synthesis and Thermokinetics studies of Co(II),Ni(II) and Cu(II) with tetradentate Schiff Base		National Conference on Multidisciplinary Reseach in Science and Technology for Healthy Lifestyle Management	National	2020		I.G.K.M.,Ralegaon	

					(NCMRST-2020)					
3	Dr.S.D.Dawada	B.Sc.IIIYear Zoology, Paper-I,Genetics				National	2020	978-93-5453-478-2	I.G.K.M.,Ralegaon	Genetics Vikas Publication House Pvy. Ltd.

Co-ordinator
Internal Quality Assurance Cell
Indira Gandhi Kala Mahavidyalaya
Ralegaon

College Code 490

PRINCIPAL
Indira Gandhi Kala Mahavidyalaya
Ralegeon Dist.Yavatmal

A Multidisciplinary Approach to Higher Education

Volume - II

Edited By

Dr. Vikrant R. Wankhade

Dr. Khushal J. Alaspure

Dr. Akash V. More

Dr. Shrikant S. Mahulkar

Published by : OnyanPath Publication

A Multidisciplinary Approach to Higher Education

Volume - II

Edited By

Dr. Vikrant R. Wankhade

Dr. Khushal J. Alaspure

Dr. Akash V. More

Dr. Shrikant S. Mahulkar

DNYANPATH
PUBLICATION

A MultidisciplinaryApproach to Higher Education / Volume II

Edited By
Dr. Vikrant R. Wankhade, Dr. Khushal J. Alaspure
Dr. Akash V. More, Dr. Shrikant S. Mahulkar

Published by the **DnyanPath Publication (INDIA)**
A Leading **National Books Publishing** House In India
The First edition published in April, 2024

ISBN 13 : 978-81-972505-0-7

ISO 9001 : 2015
ज्ञानपथ® पब्लिकेशन

Visit us
www.dnyanpath.com

Reg. Office	:	FFS-A, Block C,First Floor, Venus Plaza, Shegaon Naka, V.M.V. Road, Amravati - 444 603 (MH)
Branch Office	:	Kalash Apartment, Near Gulmohar Holl, Pande Layout Khamla Nagpur - 440 025 (MH)
Visit us	:	www.dnyanpath.org
Contact us	:	dnyanpathpub@gmail.com
Phone	:	08600353712, 09503237806

Printed at Shri Gurudeo Printers, Amravati.
Mahatma Fule Sankul, Shegaon Naka,
V.M.V. Road, Amravati - 444603 (Maharashtra)

₹ : 700/-

- I N D E X -

***

Climate Change and Impact on Agriciulture

Deshmukh N. M.
Assistant Professor
Department of Botany,
Indira Gandhi Kala Mahavidyalaya, Ralegaon, Dist. Yavatmal
Email : 23nileshdeshmukh@gmail.com

Samarth V. D.
Assistant Professor
Department of Botany,
Indira Gandhi Kala Mahavidyalaya, Ralegaon, Dist. Yavatmal
Email : vdsamarth@gmail.com

Abstract :

Climate change is one of the most significant challenges facing human being in the 21st century, which impacts on various sectors, including agriculture. Rising temperatures, decreases in rainfall, and a rise in weather shows significant challenges to agricultural productivity and food security. Growth in temperature influence on the crop phenology, growth, and development, leading to changes in crop yields and distribution patterns. Moreover, changes in precipitation patterns, including alterations in the timing and intensity of rainfall, affect soil moisture levels, water availability, and irrigation requirements. Droughts, floods, and heatwaves disrupt agricultural activities, compromise soil fertility, and increase the attack of pests and diseases, result yield losses. This abstract provides an overview of the complex relationship between climate change and agriculture, highlighting the diverse impacts on crop production and food security, suggesting required adaptions including new techniques for improvement of crop yield.

Keywords : Challenges, Rainfall, Floods, Agricultural, Yield.

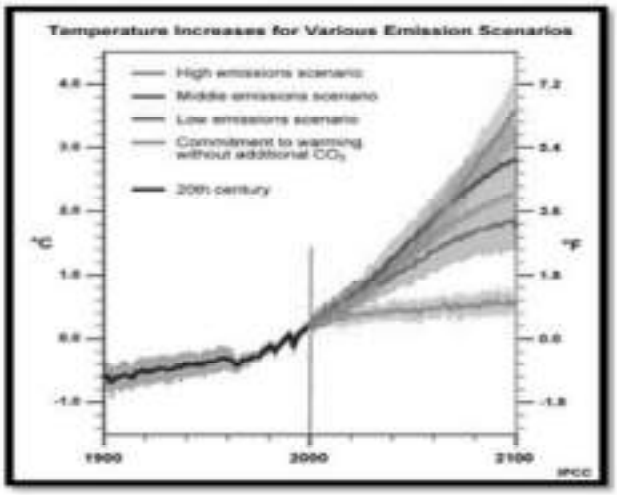
Introduction :

"Climate change refers to long-term shifts in temperatures and weather patterns." Climate change is one of the most worldwide concerns of the twenty-first century, affecting many aspects of human such as human existence, health, and the environment, including agriculture. As the Earth's climate continues to undergo rapid transformations due to human-induced activities, such as industrialization, urbanization, deforestation modernisation, etc. The Climate change included higher temperatures, higher atmospheric CO2, concentrations, changes in precipitation. Climate change may have a wide-ranging impact on agriculture, including crop quality and quantity, growth rates, photosynthesis and transpiration rates, moisture availability, and so on. Climate change is directly impact on food production across the world. So, in future sense and growing global population need of food. We have to need to focused to resolve this issue or adapt new crops patterns, techniques in agriculture sector for better yield.

Climate Change :

The climate is important for all life's including human being. The climate included all factors like temperature, Humidity, wind, etc. Due to human activities that increase greenhouse gas concentrations in the atmosphere. These activities include deforestation, urbanisation, industrialization, burning fossil fuels, and agricultural practices. Greenhouse gases such as carbon dioxide (CO2), and nitrous oxide (N_2O), methane (CH4) trap heat in the Earth's atmosphere, leading to a warming effect known as the greenhouse effect. Which is mostly responsible for global warming i.e. rise in earth temperature which shows effects like melting ice caps and glaciers, and rising sea levels, droughts, floods, etc. The Intergovernmental panel on climate change (IPCC) has projected that the average global surface temperature increases by 1.4°C to 5.8°C in 21st century with significant regional variations (IPCC, 2007).

Global Scenario of Climate Change :



Source : IPCC, 2007.

Impact of Climate Change on Agriculture :

The agriculture sector is the most important sector for human being for full fill their food needs. Climate change's impact on agriculture could lead to food security issues and altered the livelihood activities on which much of the population depends. Climate Change can affect crop yield and crop pattern that can be grown in certain areas, by impacting agricultural inputs such as water, amount of solar radiation that affect plant growth as well as the prevalence of pests. The increase in seasonal temperature can reduce the duration of many crops and hence reduce final crop yield. World agriculture faces a serious decline within this century due to climate change. Overall, agricultural productivity for the entire world is projected to decline between 3 to 16% by 2080. More countries, which have an average temperature that are already near or above crop tolerance levels, are predicted to suffer an average 10 to 25% decline in agricultural productivity by 2080s.

India's agriculture sector is mostly dependent on monsoon rainfall for water from the ancient periods. Any change in monsoon has a drastic and significant impact on agricultural yield. Even the increasing temperature is affecting the Indian agriculture field. The states like Jharkhand, Odissa and Chhattisgarh, Andhra Pradesh are mostly rice producing state, rice production losses during severe droughts average about 40% of total production, with an estimated value of $800 million (Pandey, 2007). Many other states like Madhya Pradesh, Punjab, Maharashtra, which are mostly wheat, soybean producing states decreases by 3-7% due to increases in temperature and decreases water rainfall. The major impacts of climate change will be on rain fed or un irrigated crops, which is cultivated in nearly 60% of cropland all over the India. A temperature increases by 0.5°C in winter temperature is projected to reduce rain fed wheat yield by 0.45 tonnes per hectare in India (Lal et al., 1998). Increased droughts and floods are likely to increase production variability According to the Agricultural Research Institute, every degree Celsius that the temperature rises during the growing season could result in a loss of 4-5 million tons of wheat production in the near future.

Adaptation Strategies in Agriculture :

Adaptation strategies to deal with the impact of climate change are developing cultivars tolerant to heat, water and salinity stresses and resistant to flood and drought, modifying crop management practices, improving water management, adopting new farm techniques such as resource conserving technologies (RCTs), improving pest management, crop diversification, and using the indigenous technical knowledge of farmers. Some strategies like development of new crop varieties by using plant breeding, genetic engineering techniques with higher yield potential and resistant to drought, flood, heat, water and salinity stresses will be the key to maintain yield stability.

Conclusion :

Climate change has resulted in the large-scale change in the weather pattern due to periodic modifications of earth's climate. It shows serious effect on human health, ecosystem and agriculture etc. There is urgent need to recognize and adopt the innovative and creative strategies for climate change. There is need to manage the emission of CO_2 to reduce greenhouse effect for the sustainable development. Also adopt new practices and techniques for increases in crop yield of agriculture.

References :

1. Mahato Anupama (2014) "Climate Change and its Impact on Agriculture" International Journal of Scientific and Research Publications, Volume 4, Issue 4, April 2014 1 ISSN 2250-3153
2. Kumari S., George S.J., Meena M.R., Beulah Esther D., Kumar Prateek and Vidya Sagar D. R. M. S. "A Review on Climate Change and its Impact on Agriculture in India" Current Journal of Applied Science and Technology 39(44): 58-74, 2020; Article no.CJAST.63769 ISSN: 2457-1024
3. Lal, R. (1998). Soil erosion impact on agronomic productivity and environment quality. *Critical reviews in plant sciences*, 17(4), 319-464.
4. https://www.ipcc.ch/site/assets/uploads/2018/03/ar4-wg2-intro.pdf

***

INNOVATIVE SCIENTIFIC, BUSINESS AND SOCIAL PRACTICES FOR SUSTAINABLE DEVELOPMENT

Chief Editor:
Dr. Naglaxmi N. Tirmanwar
Editor: Dr. C.R.Karar
Editor: Dr. N.S.Dharkar

Innovative Scientific, Business and Social Practices for Sustainable Development

Chief Editor:
Dr. Naglaxmi N. Tirmanwar

Editors:
Dr. C. R. Kasar **Dr. N. S. Dharkar**

"Printed by: **Harshwardhan Publication Pvt.Ltd.** Published by **Ghodke Archana Rajendra** & Printed & published at Harshwardhan Publication Pvt.Ltd.,At.Post. Limbaganesh Dist,Beed -431122 (Maharashtra)

Reg.No.U74120 MH2013 PTC 251205

Harshwardhan Publication Pvt.Ltd.

At.Post.Limbaganesh,Tq.Dist.Beed
Pin-431126 (Maharashtra) Cell:07588057695,09850203295
harshwardhanpubli@gmail.com, vidyawarta@gmail.com

All Types Educational & Reference Book Publisher & Distributors / www.vidyawarta.com

Innovative Scientific, Business and Social Practices for Sustainable Development

© Chief Editor:

Dr. Naglaxmi N. Tirmanwar

Editors:

Dr. C. R. Kasar, Dr. N. S. Dharkar

❖ Publisher :

Harshwardhan Publication Pvt.Ltd.

Limbaganesh, Dist. Beed (Maharashtra)

Pin-431126, vidyawarta@gmail.com

❖ Printed by :

Harshwardhan Publication Pvt.Ltd.

Limbaganesh, Dist. Beed, Pin-431126

www.vidyawarta.com

❖ Page design & Cover :

H. P. Office (Source by Google)

❖ Edition: Oct. 2022

ISBN 978-93-85882-65-4

❖ Price : 600/ -

change", International Journal of Sustainability in Higher Education, Vol. 10 No. 2, 152-163. https://doi.org/10.1108/14676370910945954
13. Anderson, B.B. and Ratiu, C. (2014). "The identity crisis of sustainable development", World Journal of Science, Technology and Sustainable Development, 11(1), 4-15.
14. Redecker, C., (2011). "The future of learning: preparing for change", available at:http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=4719
15. Research at https://www.policycircle.org/life/education-for-sustainable-development/
16. Yadav A. (2016). Role of Education in Sustainable Development of Modern India. Annals of Education, 2 (2), 80-84.
17. Trivedi N. (2021) . International Research Journal of Educational Psychology,5(1), 15-20.
18. Choudhary S. K. (2022). International Journal of Mechanical Engineering, 7(2),69-73.

❑❑❑

18

ENVIRONMENT AND STRATERGIES FOR SUSTAINABLE DEVELOPMENT

Deshmukh N.M.

Samarth V. D.
Department of Botany, Indira Gandhi Kala Mahavidyalaya, RalegaonDist: Yavatmal

Jagnit P. R.
Department of Chemistry, Indira Gandhi Kala Mahavidyalaya, Ralegaon Dist: Yavatmal

****

Abstract

The long-term idea of sustainable development prioritises the growth of present and future generations equally. The economic development improves the quality of life of peoples. Rapid industrialization, urbanisation, and high rate of population growth in the last 50 years has led to large-scaled environmental degradation. As a result, natural resources are rapidly depleting and environmental pollution has become one of the most important challenges being faced by the world today. Thus, it is more important to balancing economic growth and environmental protection side by side. We focus on strategies for sustainable development which are necessary for survival of present as well as upcoming generation.

Keywords: Environment, development, economic, pollution, strategies

1. Introduction :

The environment consists all living or biotic factor and non-living or abiotic factor that influence to each other. Living things included plants, birds, animals, microbes etc. and non-living thing included soil, rocks, water, air, temperature, etc. The environment provides

various resources to humans, like renewable and non-renewable. Renewable resources are those resources which are replenished easily over time, and hence can be used without the possibility of the resource becoming depleted or exhausted. e.g. trees in the forests, water, fishes in the ocean, etc. Non-renewable resources are those resources which can get exhausted or depleted over the time as they are used upe.g.fossil fuels, natural gas, coal, etc. Therefore, these resources must be utilised wisely while taking into account the needs of future generations.

Sustainable development is a most concern phenomena for every country including developing country like India. Most of the countries in the world realised that their future generation must suffer to lack resources which is most important to survive. The concept of sustainable development is not related only future generation but also with the current generation. The right to development refers to the ability to promote social, political, economic, and cultural circumstances that can raise overall standards of living.

2. Challenges for Sustainable development

2.1 Population:

The challenges for sustainable development are clearly visible. A significant obstacle to sustainable development is population growth. In the beginning of the 21st century the population of the earth reaches 6 billion (Gupta & Chaturvedi 2011). India is the second highest populated country of the world. About 16.87% population of the world lived in India. Due to the tremendous growth rate in population, increased the rate of demand of food, land, water, energy, etc. to full feel this increasing demand large scale of natural resources has been used.

CENSUS YEAR	POPULATION	CHANGE (%)
1951	36,10,88,000	–
1961	43,92,35,000	21.6
1971	54,81,60,000	24.8
1981	68,33,29,000	24.7
1991	84,63,87,888	23.9
2001	1,02,87,37,436	21.5
2011	1,21,07,26,932	17.7
2022 Est.	**1,417,170,000**	15.1

Fig: Population growth in India per decade

2.2 Water:

Water is a common factor in all sectors of development. Because water and development have a strong linkage. Monitoring the sustainability of water resources can effectively provide an indication of sustainable development in the region. Drinking water scarcity in many regions of India is a major obstacle to sustainable development. Drinking water increasingly fails to meet standards due to pollution, wastage of rain water, unused of waste water, poor condition of supply systems and sewerage systems. Apart from households, water being an essential input to agriculture, industry and commercial purposes like electricity generation, aesthetics and recreation etc.

2.3 Energy

Consumption of energy is a major challenge for sustainable development. Energy is crucial to social and economic well-being and is required for the advancement of humanity(Jyoti, 2016).Large population has large demand of energy, to satisfy the daily need used more amount of coal, nuclear energy that pollute the environment. Therefore, it's crucial to utilise energy wisely and use the right fuel to prevent future crises. This may be achieved by using renewable energy in lieu of non-renewable resources and efficient technology in place of inefficient ones.

2.4 Land

Land use is mainly to satisfy commercial, residential and industrial requirements and also to improve public facilities, which in turn enhance quality of life. The land usage pattern changes due to the interaction of demographic, political, economic, societal, environmental, and cultural reasons. However, this leads to change a direct and serious impact to the natural environment. Since land is a limited resource, it needs to be used in a sustainable manner. Strategies for maximising economic growth,

advancing social welfare, and reducing the negative effects of human activities on the environment are necessary for sustainable land use.

2.5 Insecticide & Pesticides

In the developing countries, the uses of insecticide and pesticidehas increased to control the insects and pestsin agriculture field on large scale. Itimpacts adversely on environment as well as human health directly or indirectly.

2.6 Plastic

Plastic is one of the new major challenges for sustainable developments well as developing countries. Globally use of plastics increases tremendously day by day for daily needs. It is used to making polybags, making furniture,cups,kabot, bottals, decorative material, etc. after used of all this thing it converts in to waste material which is hazardous to living health.

3. Strategies for Sustainable development

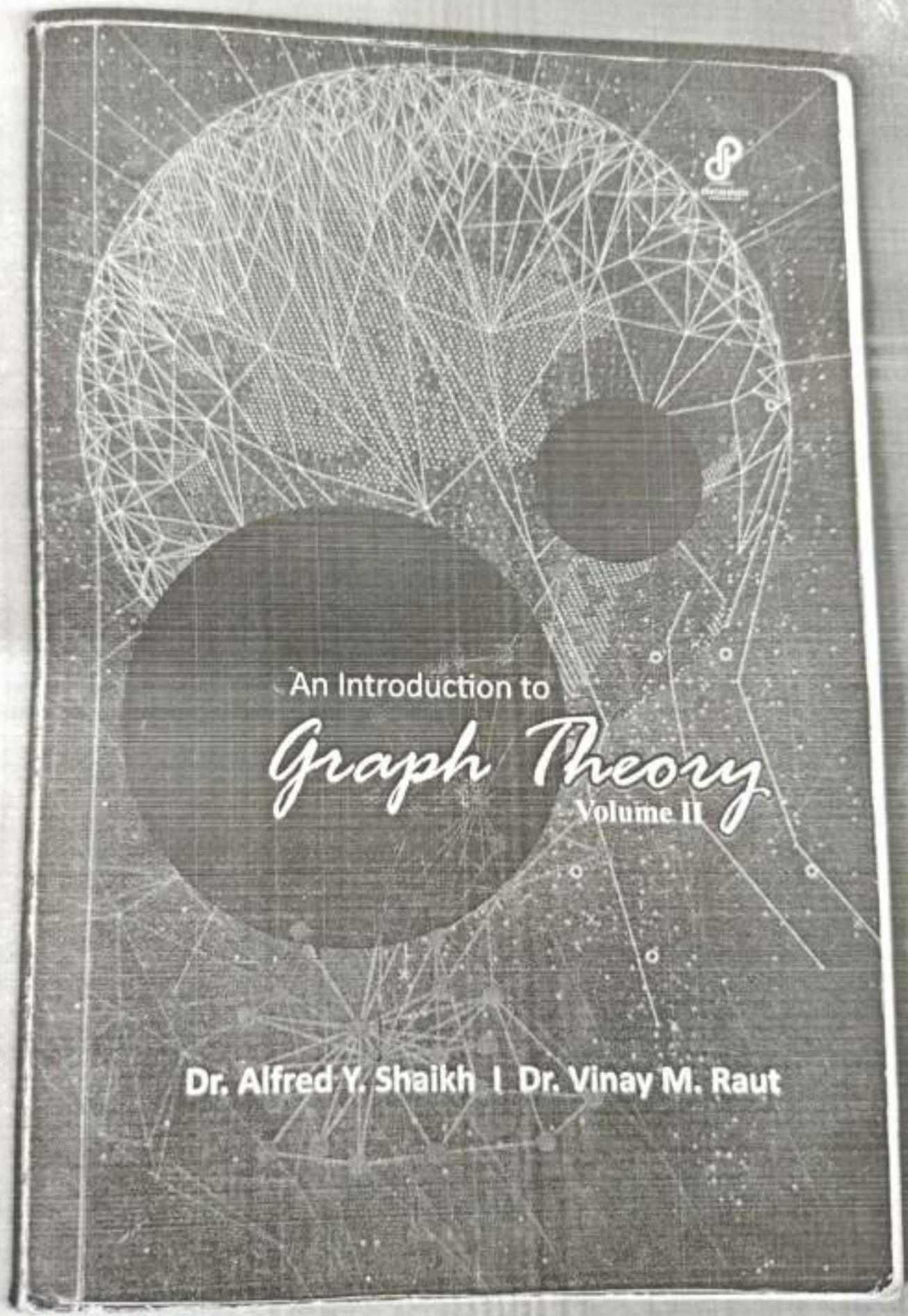
The goal of sustainable development is not to obstruct the process of progress, but rather to use resources in a way that establishes relationships between the current and the future generation. To prevent future scarcity, long-term usage of natural resources must be sustainable. New efficient technologies can be reducing the exploitation of resources. So, this technology may good for sustainable development using eco-friendly fuel like LPG,CNG and solar energy can reduce the greenhouse gases production on the earth. Many countries as well as in many Indian metro cities bus corporation has been moved on CNG and electric buses for transportation. It is one of the best efforts to reduce the CO2 and other harmful gases. Also, government of India focus on renewable sources of energy like solar, wind and water for energy need. Government of India has formed new policies, developed new schemes for increase of renewable energy used by peoples. Government provided solar pump, solar rooftop, LPG gases to peoples on government subsidy.Water is in great scare in many parts of our country. People do not have enough clear and safe water to drink. Conserving water is crucial if we want to protect it from pollution and waste. Water can be conserved by harvest rain-water; check overflow of roof-top tanks, recycled used water. Plastic use is a major issue for environment, social health and sustainable development. Recently Indian government banned single use of plastic. It is a first step toward the decrease use of plastics. Scientist continuously search for new optional material, which replace the plastic.

Conclusion :

The sustainable development is a vision and way of thinking and acting on it. So that we can secure the natural resources and surrounding environment for our future generation. It is not possible to creating policies only by government it must be taken up by society at large scale. People should implement it in their daily life and spread awareness among societies. Sustainable development not an issue of single country, all countries should share common interest and responsibility in addressing the challenges of environment and sustainable development. India continuous moving toward a sustainable development in agriculture, check on population, environment, water, forests, energy,etc. Also developed many policies, acts, programmes for sustainable development & implement it on ground level.

References

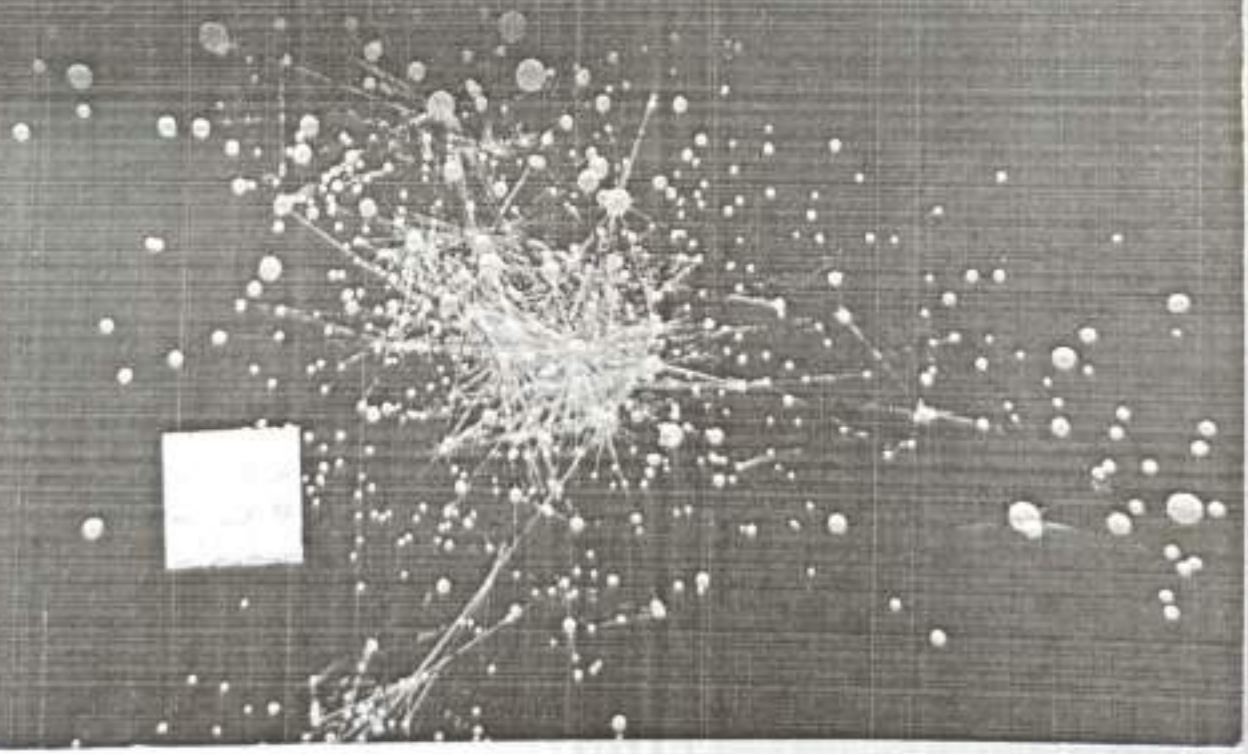
- Jyoti "India's Strategies for Sustainable Development" Indian journal of research, Vol. 5, Issue 8, Pg. 240-241(2016).
- KristleNathanH.S., &Sudhakar Reddy B.,"A conceptual framework for development of sustainable development indicator" pg. 21-27(2016).
- Bora P. &Sarma M.M., "Sustainable development and Indian manifestos: A study of haves and have nots" Planet Ink. (2011).
- Gupta S.K., & Chaturvedi B. K, "Strategies for Sustainable Development in India" Asian Journal of Social Science Review, Vol.01 (2011).



An Introduction to Graph Theory

Volume 1

- Dr. Alfred Y. Shaikh
- Dr. Vinay M. Raut



SGB Amravati University

Mathematics (B Sc III- Semester VI- Paper XI)

Introductory Linear Algebra

M Karade J N Salunke S V Gore

P Tadas G C Bhagat K V Somwanshi

SONU NILU
A304, Shiv Priya Towers, Jaitala, Nagpur 440 036

Our titles for B Sc I, II, III and M Sc

B Sc III Semester V (New)

Paper IX: Elements of mathematical analysis

Paper X: Mathematical methods

B Sc III - Semester VI (New)

Paper XI: Introductory linear algebra

Paper XII: Elements of special relativity (optional)

M Sc

Lectures on Advanced Analysis

Elements of General Relativity

Elements of Riemannian Geometry

Engineering Mathematics Series

Ordinary differential equations Vol I

SONU NILU
ISBN 978-81-88763-30-6

... cosmology. The general populace has consistently shown greater fascination with the observable entities of astronomy rather than imperceptible atoms, and most likely encountered the field of cosmology for the first time through Steven Weinberg's renowned publication, "The First Three Minutes." While there is already a wide selection of popular monographs on cosmology, there is a lack of beginning textbooks specifically designed for university undergraduate level. Introductory works on relativity or astronomy have chapters on cosmology, although these chapters provide just a partial coverage of the subject. Undoubtedly, there are already excellent publications available on the subject of cosmology. The reader will indeed discover several references to such publications, which have proven to be an essential source of information for me. Cosmology, being expressly cross-disciplinary, does not hold a significant role in either physics or astronomy courses. Specifically, this text does not presume any prior understanding of general relativity.

Dr. Alfred Y. Shaikh, Assistant Professor and Head, Department of Mathematics, is presently working in Indira Gandhi Kala Mahavidyalaya, Ralegaon. He completed M.Sc. (Mathematics) degree with specialization in Computational Method in Mathematics in the year 2004 from Sant Gadge Baba Amravati University, Amravati.

Alfred Shaikh

Introduction to Cosmology

LAP LAMBERT Academic Publishing

PROCEEDING

National Conference on Emerging Trends in Computational Science and Technology

(NCETCST-2024)

MARCH 22, 2024

Shri Shivaji Education Society, Amravati's

Shri Shivaji Science College, Amravati

NAAC: A+ Grade (CGPA 3.42), UGC: CPE, NIRF-2022 & 2023: Rank Band 151-200,
IT Star College (Strengthening Component), DST FIST, ISO: 9001:2015, SGBAU: Lead College, Career Katta: Centre of Excellence

Holographic Dark Energy Model by Sharma and Mittal with Bouncing Scenario

A. Y. Shaikh
Department of Mathematics
Indira Gandhi Mahavidyalaya,
Ralegaon , India

A. S. Mankar
Department of Mathematics
Shri Shivaji Science College,
Amravati, India

V. M. Raut
Principal,
Shri Shivaji College of Education,
Amravati, India

Abstract :

In a flat FRW universe, the bouncing model is studied in the presence of Sharma-Mittal Holographic Dark energy. The equation of state (EoS) parameter for the SMHDE model describes the ironic behavior of the universe. The kinematic and physical characteristics of the models are analyzed in detail.

Keywords :

FRW metric, SMHDE, Bouncing scenario.

Introduction :

A persistent physical enigma is the character of the expanding universe linked to a strange energy source known as dark energy (DE). Large-scale structure, cosmic microwave background anisotropies, and observations of type-Ia supernovae provide evidence for this expansion. Quintessence, K-essence, tachyon, phantom, ghost condensate, quintom, Chaplygin gas models, and agegraphic DE models are a few contenders that fit the DE criteria [1-15]. The HDE has been thoroughly examined in the literature and is a good candidate for DE. Its foundation is the holographic principle, which claims that a system's number of degrees of freedom scales with area rather than volume. According to research by Cohen et al., the DE must adhere to the holographic principle and be limited by the infrared (IR) cut-off. Li has looked at the Hubble horizon, the future event horizon, and the particle horizon as potential candidates for the IR cutoff. She has also demonstrated that only the future event horizon can give the cosmos the necessary acceleration. Sheykhi [16] created the Hubble horizon HDE model and contended that, with the aid of DE and cold dark matter (CDM) interaction, this model could account for the current condition of the universe. In order to identify the evolution of the universe under the assumption that it is occupied by both cold dark matter and interrelating dark energy, new holographic dark energy models, THDE, RHDE, and SMHDE, have recently been established using an inventive formulation for entropy combined with the holographic principle (see Ref. [17]).

In this study, we looked into the General Theory of Relativity in relation to the bouncing model. The main goal of this paper is to study the bouncing conducts at an early era and the cosmic speed singularity in late time. In the framework of a flat FRW world, the bouncing model is examined in the presence of Sharma-Mittal Holographic Dark Energy (SMHDE).

Metric and Field Equations :

A flat FRW metric is given by

$$ds^2 = dt^2 - a^2(t)(dx^2 + dy^2 + dz^2), \qquad ...(1)$$

where $a(t)$ is the scale factor and is a function of t. The Einstein field equations in General Relativity are written as follows:

$$R_{ij} - \frac{1}{2}g_{ij}R = -(T_{ij} + \overline{T}_{ij}). \qquad ...(2)$$

The energy momentum tensor for matter and DE is defined as $T_{ij} = \rho_m u_i u_j$; $\overline{T}_{ij} = (\rho_{de} + p_{de}) u_i u_j - g_{ij} p_{de}$, where ρ_m and ρ_{de} are the energy density of matter and DE density, respectively, and p_{de} is the pressure of the DE, while the equation of state (EoS) is defined as $\omega_{de} = \frac{p_{de}}{\rho_{de}}$. The field equations for the metric (1) are obtained as:

$$3H^2 = \rho_m + \rho_{de}, \qquad ...(3)$$

$$2\dot{H} + 3H^2 = -p_{de}. \qquad ...(4)$$

Bouncing Cosmology :

Imagine a symmetric bounce across the scale factor $a = e^{\gamma t^2}$, in which γ a positive constant parameter governs the cosmic expansion. The Hubble parameter is computed as $H = \frac{\dot{a}}{a} = 2\gamma t$. The scale factor behaves symmetrically at the bouncing point. There is a

Accelerating Magnetized Strange Quark Cosmological model for Bianchi type I (Kasner metric) in modified gravity

A. Y. Shaikh
Department of Mathematics
Indira Gandhi Kala Mahavidyalaya,
Ralegaon - 445402, (M.S.), India
Email : shaikh2324ay@gmail.com

M. G. Bhujade
Department of Mathematics
Lokmanya Tilak Mahavidyalaya
Wani - 445304, (M.S.), India
Email : mgbhujade20@gmail.com

ABSTRACT :

In this paper, we have explored magnetized strange quark matter (MSQM) solutions for the Bianchi-I Kasner metric in $f(R,T)$ gravity. The Bianchi-I Kasner type metric with magnetized strange quark matter (MSQM) distribution in $f(R,T)$ gravity is considered, where R is the Ricci scalar and T the trace of matter source. For examination, the function $f(R,T)=f_1(R)+f_2(T)$ with the cosmological constant Λ is selected. We discovered that the strings are there in the early phases of the universe's evolution and vanish with the passage of time. The action of the string may be the cause of the fluctuation in the equation of state (EoS) parameter $p=-\rho$. We discover that the string tension is constant throughout the evolution of cosmos. Magnetic field is not observed in our solutions.

Keywords :

Kasner metric, magnetized strange quark matter, modified theories of gravitation.

1. Introduction :

One of the most significant mysteries of cosmology is the discovery of cosmic fast expansion, which has been verified over the past 20 years by a variety of observations. Dark energy (DE), a negative-pressure energy, is thought to be the source of cosmic acceleration. Rather of relying on the mysterious concept of DE, changed theories of gravity, which are only extensions of general relativity can be used to reproduce the dynamics that characterise the expanding cosmos. As a reasonable explanation for dark energy and the universe's expansion, these hypotheses are attracting the attention of an increasing number of individuals. A number of ideas, each with an unique importance, including $f(R)$ theory [1], Brans-Dicke cosmology [2], f(T) $f(T)$ gravity [3], and others. A fascinating extension of GR which has received a lot of interest recently is the f(R,T) theory of gravity, one of the various modified theories of gravitation put forward by Harko et al. [4]. The gravity theory, represented by f(R,T), may give an explanation for the universe's late-time cosmic acceleration. Assuming an auxiliary scalar field along with two known forms of scale factor, Houndjo et al. were able to demonstrate a transition from the matter-dominated era to an accelerated era by re-establishing f(R,T)=f(R)+f(T) [5]. In f(R,T) gravity theory, Sharif and Zubair have studied the law of thermodynamics [6]. Recent findings show that magnetic fields exist in galaxy clusters, pulsars, and neutron stars [7]. Even if the majority of their genesis is still unknown, magnetic fields were crucial to the creation of structures in the early cosmos. In this study, we employ f(R,T) for the Kasner metric to relate magnetic fields to strange quark matter in gravitational models.

Large-scale observations reveal the cosmos to be homogenous and isotropic. The isotropy of a pre-recombination epoch is not supported by any observed evidence. The observed local anisotropies in galaxies, clusters, and superclusters prompted the investigation of anisotropic models [8]. The Kasner metric is invariant under an abelian translation group in three dimensions. The Kasner solution, which Taub developed, depicts an idealised universe expanding in a more anisotropic way. The Kasner solution is essential to the study of temperature isotropy, primordial nucleosynthesis, magnetic field evolution, big particle survivability, inflation and anisotropy in the creation of quantum particles, and statics of the microwave background, as stated by Palathansis et al. [9]. Clifton studies the existence of solutions in higher order theories [10]. The Kasner solution in f(T) cosmology has been examined by Skugoreva and Toporensky [11]. Furthermore, in order to get precise cosmological solutions in the fourth order gravity theory, Clifton and Barrow have examined the initial singularity using the Kasner metric [12]. Gao and Shen found a new method for solving static and solutions with spherical symmetry for f(R) theory of gravity [13]. The Killing tensors were used by Paliathansis to develop new integrable f (R)

Dynamic Analysis of Renyi Holographic Dark Energy with Granda–Oliveros IRCut-off

A. Y. Shaikh
Department of Mathematics,
Indira Gandhi Kala Mahavidyalaya,
Ralegaon-445402. (M.S.)India.
shaikh2324ay@yahoo.com

A. P. Jenekar
Department of Mathematics,
Arts, Commerce and Science College,
Mangaon-445303.(M.S.)India.
apjenekar@gmail.com

Abstract :

This work examines the Hypersurface-homogeneous cosmological model within the context of gravity, using Renyi holographic dark energy (RHDE). To get exact solutions for the field equations, it is assumed that the shear scalar is proportional to the expansion scalar Accounting for the time-varying deceleration parameter allows for a thorough analysis of the cosmological model solution. The RHDE is examined using the Granda-Oliveros infrared (IR) cutoff. Various physical and kinematic properties of the model are also investigated. Furthermore, three physically possible cosmological scenarios are presented with respect to the parameter that appears in the space-time metric.It was found that the findings of our investigation agreed with the recent observational data.

Keywords :

Homogeneous-hypersurface,Renyi holographic dark energy, gravity.

1. Introduction :

The expansion of our Universe is currently happening at a faster pace, as evidenced by observational cosmic evidence [1-4]. Dark energy (DE), which has negative pressure and accounts for 70% of the peculiar ingredient [5-8], drives the cosmic expansion of the universe. Even though there is ample evidence, the DE issue in theoretical physics is still unsolved. Researchers are exploring modified gravity further in an attempt to give an explanation for the cosmic acceleration of the universe and to describe the DE. The most fundamental modifications to General Theory of Relativity (GTR) are represented by the $f(R)$ theories, which introduce the arbitrary function of Ricci scalar in Einstein-Hilbert action. Buchdahl [9] presented $f(R)$ gravity in an effort to explain the universe's fast expansion and the evolution of its $f(R)$ structures. Numerous researchers have investigated $f(R)$ gravity in different cosmological scenarios [10–20]. Among the several modified theories of gravity, $f(R)$ gravity is considered one of the most appropriate models with important cosmological implications.

From the perspective of black hole physics, the holographic principle which was initiallyproposed by G'tHooft [21] seems to be a suitablecandidate for the explanation of dark energy, which is why holographic dark energy (HDE) has become the stronger contender. As suggested by Susskind [22] and Bousso [23], the holographic principle states that a system's entropy rises with surface area rather than volume. Extending this, a unique cosmic application of the holographic principle was introduced by Fischer and Susskind [24] and Cohen et al. [25], eclipsing the realm of black hole physics. The way in which these HDE models then correspond with available observational data is illustrated by the analysis presented in [26–29]. Different cosmological models have been illustrated and constructed using a variety of entropy generalisations, including the holographic DE models of Tsallis [30,31], Sharma–Mittal [32], and Renyi [33]. According to [34–39], many researchers have recently concentrated on RHDE in a range of cosmological scenarios as Renyi HDE shows better stability on its own in the non-interacting cosmos.

This paper investigates the analysis of time-varying deceleration parameter in hypersurface-homogeneous space-time with RHDE under the framework of $f(R)$ gravity. Section 2 discusses the hypersurface-homogeneous space-time, along with Field equations incorporating pressureless dark matter, and the RHDE model with Granda–Oliveros IR Cut-off. In Section 3, the metric potentials are deducted while taking into account the proportional relationship between the expansion and shear scalars. The kinematical and physical properties of the model are covered in Section 4. Lastly, the conclusions and discussion are presented in Section 5.

Conference Proceedings

UGC Sponsored
National Conference on

Recent Advancements in Science and Technology

VOLUME V : Mathematics & Library Science

:: Organized by ::

Vidya Bharati Shaikshanik Mandal's

Vidya Bharati Mahavidyalaya, Amravati

Re-accredited with Grade 'A' by the NAAC (CGPA 3.23 - Third Cycle)
College with Potential for Excellence (CPE Status Thrice by the UGC)
Star College Status by DBT, New Delhi, Mentor College under Paramarsh by UGC
Identified as Lead College by S.G.B. Amravati University, Amravati

:: In Collaboration with ::

S.S.S.K.R. Innani Mahavidyalaya

Karanja (Lad), Dist. Washim 444105 (M.S.), India
NAAC Re-Accredoted 'A+' Grade (CGPA 3.28)
C.P.E. Status Awarded by UGC, New Delhi
Affiliated to Sant Gadge Baba Amravati University, Amravati

ISBN : 978-81-19931-25-5

 ISBN : 978-81-19931-25-5

1

Dynamic Analysis of Renyi Holographic Dark Energy with Hubble's IR Cut-off

A. Y. Shaikh[a,*], K. S. Wankhade[b,§], A. P. Jenekar[c,*]

[a]Department of Mathematics, Indira Gandhi Kala Mahavidyalaya, Ralegaon-445402. (M.S.) India.
[b]Dept of Mathematics, Yashwantrao Chavan Arts and Sci Mahavidyalaya, Mangrulpir-444403. (M.S.) India.
[c]Dept of Mathematics, Arts, Commerce and Science College, Maregaon-445303. (M.S.) India.
[a]Email: shaikh_2324ay@yahoo.com; [b]Email: wankhade.kishor@rediffmail.com;
[c]Corresponding Author Email: apjenekar@gmail.com

ABSTRACT

The present study deals with investigation of Hypersurface-homogeneous cosmological model with Renyi holographic dark energy (RHDE) in the confines of the $f(R)$ gravity. The shear scalar is assumed to be proportional to the expansion scalar in order to achieve the precise solutions of the field equations. Analysis of the solution of cosmological model is done by taking the time-varying deceleration parameter into account. The Hubble horizon is used as an infrared (IR) cutoff when examining the RHDE. Numerous kinematical as well as physical characteristics of the model are also examined. Moreover, regarding the parameter K that appear in the space-time metric, three physically feasible cosmological cases are described. We found that the outcomes of our study align with recent observational data.

Keywords: Renyi holographic dark energy, Homogeneous-hypersurface, $f(R)$ gravity.

1. Introduction

According to observational cosmic evidence, the expansion of our Universe is presently occurring more rapidly [1-4]. The force driving the universe's cosmic expansion is dark energy (DE), which possesses negative pressure and makes up 70% of the peculiar ingredient [5-8]. Notwithstanding all the evidence, the DE issue in theoretical physics remains unsolvable. In an effort to provide a description of the DE and explain the cosmic acceleration of the cosmos, researchers are delving further into modified gravity. With the introduction of the arbitrary function of Ricci scalar R in Einstein-Hilbert action, the $f(R)$ theories represent the most basic alterations to General Theory of Relativity (GTR). As a generalisation of Einstein's relativity, Buchdahl [9] presented $f(R)$ gravity in an effort to explain the universe's fast expansion and the evolution of its structures. Numerous researchers have investigated $f(R)$ gravity in different cosmological scenarios [10–20]. Among the several modified theories of gravity, $f(R)$ gravity is deemed highly suitable models with significant cosmological value. From the standpoint of black hole physics, the holographic principle that first put out by G't Hooft [21] seems to be a suitable fit for the explanation of dark energy, which is why holographic dark energy (HDE) has become the stronger contender. As suggested by Susskind [22] and Bousso [23], the holographic principle states that a system's entropy rises with surface area rather than volume. Extending this, a unique cosmic application of the holographic principle was introduced by Fischer and Susskind [24] and Cohen et al. [25], eclipsing the realm of black hole physics. The analysis provided in [26–29] demonstrates how these HDE models then correlate with current observational data. A number of entropy generalisations have now been used to illustrate and build different cosmological models, such as the Tsallis [30,31], Sharma–Mittal [32], and Renyi [33] holographic DE models. Since Renyi HDE exhibits more stability on its own in the non-interacting universe, numerous researchers have recently focused on RHDE in a variety of cosmological situations, as stated in [34–41].

 ISBN : 978-81-19931-25-5

10

Exploration of Barrow Holographic Dark Energy in Modified Theory of Gravitation

A.Y. Shaikh*, S.M.Shingne, S.V.Gore*
*Department of Mathematics, Indira Gandhi Kala Mahavidyalaya, Ralegaon -445402, India.
Department of Mathematics, G.S.Science College, Khamgaon-444312, India.
e-mail: shaikh_2324ay@yahoo.com , smshingne131@gmail.com

Abstract:
In this paper, we consider the Bianchi-I Kasner type space-time in the presence of Barrow Holographic Dark Energy in the context of $f(R,T)$ theory of gravitation. It is observed that universe is accelerating through the variation of the equation of state (EoS) parameter. In addition, stability of the BHDE model has been examined by squared sound speed v_s^2.

Keywords: Kasner metric, $f(R,T)$ gravity, Barrow Holographic Dark Energy.

1. Introduction

One of the most straightforward methods for replicating the observed late-time expansion of the Universe is through alternative theories of gravity [1-3]. Furthermore, there are a number of consistency issues with general relativity (GR) [4, 5] that need to be resolved in the end. The question therefore becomes, which gravity theories preserve the positive aspects of General Relativity while addressing some of the unanswered problems? The most logical and natural extension of the Einstein-Hilbert action is to substitute any function f(R) for the Ricci scalar R. This is the widely recognized Gravitation hypothesis f (R). The late-time cosmic acceleration has been tested to be explained by this modified gravity hypothesis , and it is consistent with the local gravitational tests [6–12]. Harko et al. [13] have recently suggested an additional adjustment that takes the Einstein-Hilbert action into consideration and represents it as f(R,T) ,where T is the trace of the energy-momentum tensor. The incorporation of the matter element in the gravity Lagrangian may have been justified by the quantum effect manifested as conformal anomaly. Nevertheless, because of the interaction between matter and gravity, this gravity model depends on the source term. As a result, test particles lack a geodesic path and a hypothetical force term exists perpendicular to the four velocities. Moreover, the field equations get extremely complex.

The authors are motivated to investigate various cosmological issues because of the crucial role that the Kasner [14, 15] metric has played in clarifying the existence, composition, and singularities of anisotropic cosmological models in general relativity. One of the metrics that is studied the most is the Kasner metric. Its applicability in building of cosmological models and its usefulness for specific investigations of basic particles have made it especially appealing for use. Due to its simplicity, it has been "rediscovered" numerous times and shares a close relationship with measures provided by Weyl, Levi-Civita, and Wilson several years prior. The dynamic form of the synchronous Bianchi I metric has virtually replaced the one in which Kasner first described it. The space-time is invariant under a three-dimensional Abelian translation group, and the Kasner solution generally gives an anisotropic metric in which the space directions are Killing translations. The Kasner metric is a one-parameter family of solutions for a four-dimensional space-time because it contains three parameters, or the Kasner indices, which must fulfil the two so-called Kasner algebraic relations. In particular, the intersection of a three-dimensional sphere with radius unity and a plane in which the total of those parameters equals one defines the values of the parameters on the real number line.

 ISBN : 978-81-19931-25-5

26

Panoramic Behaviour of Magnetized Strange Quark Matter in Modified Theory of Gravitation

A. Y. Shaikh[1,a], M. G. Bhujade[2,b]

[1]Department of Mathematics, Indira Gandhi Kala Mahavidyalaya, Ralegaon-445402, (M.S.), India.
[2]Department of Mathematics, Loknanya Tilak Mahavidyalaya, Wani-445304, (M.S.), India.
[a]Email: shaikh_2324ay@yahoo.com, [b]Email: mgbhujade20@gmail.com (Corresponding Author)

ABSTRACT

In this paper, The Bianchi-I Kasner type metric with magnetized strange quark matter (MSQM) distribution in $f(R,T)$ theory of gravitation is considered, where R is the Ricci scalar and T the trace of matter source. For examination, one functional version of the function $f(R,T)$ is selected. We discovered that the strings are there in the early phases of the universe's evolution and vanish with the passage of time. The action of the string may be the cause of the fluctuation in the equation of state (EoS) parameter $\omega = p/\rho < -1$. We discover that the magnetic flux and string tension are constant throughout the evolution of cosmos.

Keywords: Kasner metric, magnetized strange quark matter, modified theory of gravitation.

1. Introduction

The study of cosmic accelerated expansion, which has been validated by various observations over the last two decades, is one of the most important cosmological enigmas among cosmologists. It is believed that cosmic acceleration is driven by some kind of energy with negative pressure known as dark energy (DE). Instead of resorting the mysterious concept of DE, there is an alternative way to reproduce the dynamics of the expanding universe through modified theories of gravity which is an extension of general relativity (GR). These theories are gaining more and more attention every day, due to the possibility that dark energy and the universe's expansion may be explained by these ideas. Some of these theories are called $f(R)$ theory [1], Brans-Dicke Cosmology [2], $f(T)$ gravity [3], and so on, each theory has its own importance. A fascinating extension of GR that has drawn a lot of interest recently is the $f(R,T)$ theory of gravity, which is one of the various modified theories of gravitation that Harko et al. [4] presented. The gravity hypothesis represented by $f(R,T)$ can account for the universe's late-time cosmic rapid expansion. By reconstructing $f(R,T) = f(R) + f(T)$, Houndjo et al. [5] were able to establish a transition from a matter-dominated phase to an accelerated phase using an auxiliary scalar field with two known forms of scale factor. The law of thermodynamics in $f(R,T)$ gravity theory has been investigated by Sharif and Zubair [6]. However, it is important to investigate magnetic fields and quark gluon plasma to understand the early universe. Recent observations indicate that neutron stars, pulsars also galaxy clusters have magnetic fields [7]. Although their origin is still largely unknown, magnetic fields had a significant influence in the creation of structures in the early cosmos. This work uses magnetic fields to be connected to strange quark matter in gravitational models using $f(R,T)$ for the Kasner metric.

The universe appears homogeneous and isotropic at large scales. However, there isn't any observable evidence to support the isotropy of a pre-recombination period. Anisotropic models were investigated as a result of the reported local anisotropies in galaxies, clusters, and superclusters [8]. An Abelian translation group in three dimensions does not affect the Kasner metric. The Kasner solution, which Taub developed, depicts an idealised universe expanding in a more anisotropic way. According to Palathansis et al. [9], the Kasner solution is crucial for the study of anisotropy in the generation of quantum particles, inflation, large particle survival,

भारतीय ज्ञान-परम्परा में पर्यावरण चिन्तन

Environmental Thoughts in Indian Knowledge Tradition

Editor
Dr. Suman Kumari

Environmental Conservation : A need of the hour

A.Y. Shaikh

Department of Mathematics, Indira Gandhi Kala Mahavidyalaya, Ralegaon-445402. (M.S.), India., e-mail : shaikh_2324ay@yahoo.com

Abstract :

An ideology known as environmentalism emphasises how important it is for people to respect, safeguard, and keep the natural world free from anthropogenic (caused by people) ills. Climate change, pollution, environmental deterioration, and resource depletion may all be major environmental problems right now. The conservation movement campaigns against genetically engineered foods, global warming, and endangered species. It also advocates for the preservation of any biologically significant natural regions.

Introduction :

What connects us all is the Earth. The forest is Mother Nature's cover. There is no heaven on Earth, but there are many places like this in nature. Kashmir is referred to as the paradise and Switzerland as the earth's heaven. The purpose of World Nature Conservation Day, which is celebrated on July 28 to support sustainability, raise awareness of environmental protection, and promote conservation. This day recognises that a stable and healthy society is built on a

06

Impact of COVID-19 Pandemic on Education and Students in India

A.Y.Shaikh*, S.V.Gore*, V.L.Barde#

*Department of Mathematics, Indira Gandhi Mahavidyalaya, Ralegaon-445402. (M.S.).India.

Knowledge Research Centre, Indira Gandhi Mahavidyalaya, Ralegaon-445402. (M.S.).India.

Abstract:

This study investigates the COVID-19 circumstances in India confer the influence of it on education and students. Due to VID-19, higher education institutions transitioned to online learning. s study discovered college student's observations of their lementation, use, and recognition of emergency online learning. whole educational system from basic to tertiary level has been nken during the lockdown epoch of the novel coronavirus disease) (COVID-19) not only in India but across the globe. The ioned resolve of this manuscript pursues to report the mandatory tialities of online teaching-learning in education amid the COVID- ndemic and how can existing possessions of educational utions successfully transmute proper education into online ation with the help of virtual classes and other vital online atuses in this frequently fluctuating educational background.

Keywords: COVID-19; students ; online learning; institutions .

The book entitled fundamental of Solid Waste Management is designed as a base book for the undergraduate and postgraduate level courses in the field of Science, Engineering and Technology. The feature of the book is that it is written with highly interdisciplinary approach to enrich the knowledge of the students of various courses such as Environmental studies, Environmental Science, Chemistry, Environmental chemistry, Environmental Engineering of UG and PG. This book is also very much useful researcher for an environmental enquiry, research.

The book divides into five chapters included introduction, definition, classification, factor affecting generation, sources of wastes, composition, physical, chemical, biological characteristics, impact of solid waste on human health, on land, animals and environment, collection, storage, transportation and solid waste treatment and disposal techniques. The rapid industrial & developmental activities, improving standard of living and economic status of family, population explosion etc has resulted in generation of huge volume of solid waste.

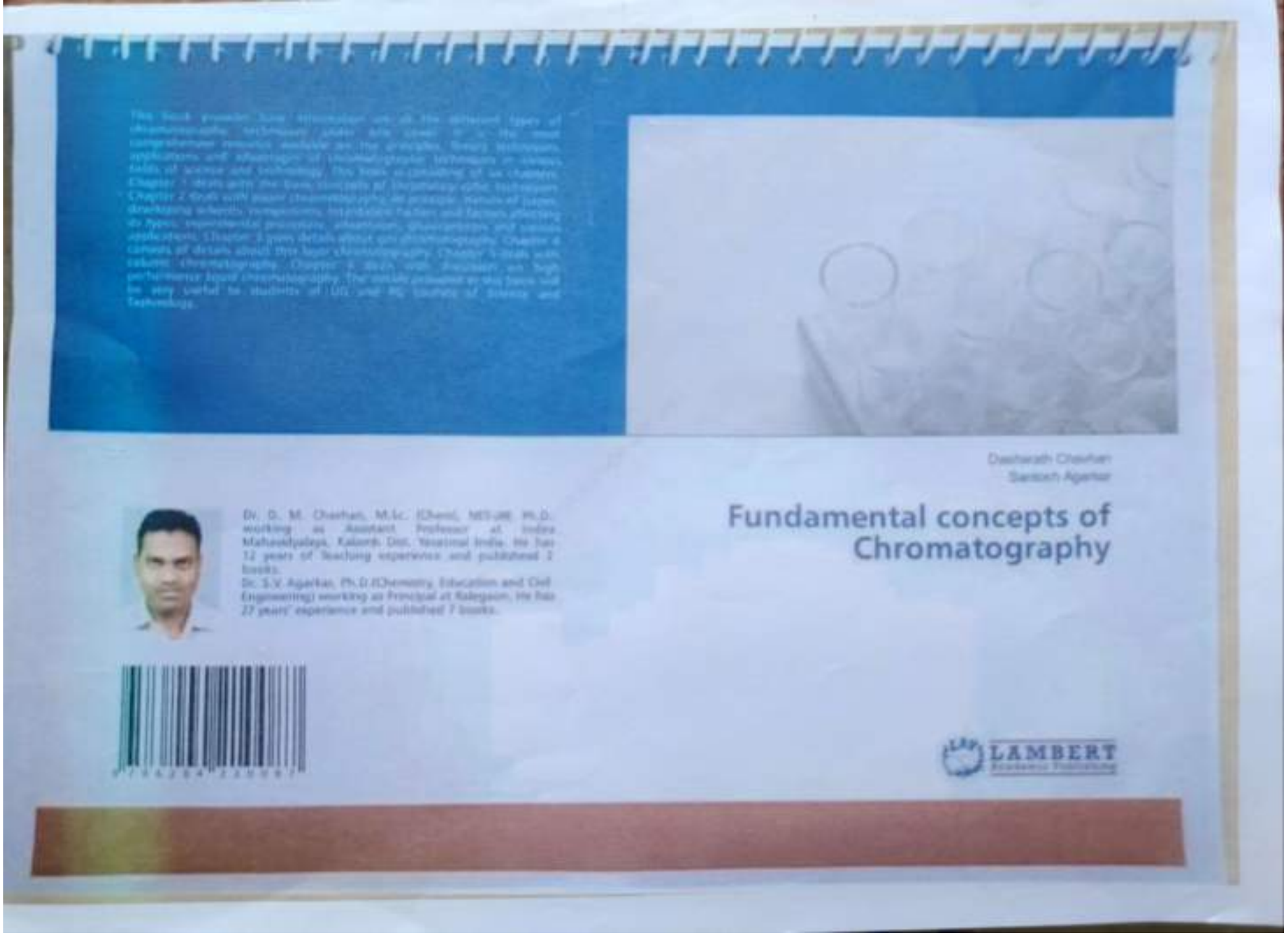
Santosh Agarkar
Suryakant Borul

Fundamental of Solid Waste Management

Dr. Santosh Vyankatrao Agarkar, M.Sc., Ph.D., M.Ed., Ph.D., M. Tech.
He is working as Principal at Indira Gandhi Kala Mahavidyalaya, Kalegaon having 25 years experience.
Dr. Suryakant Bhanudas Borul, M.Sc., M.Phil., Ph.D.
He is working as head of department of Chemistry and Asstt. Prof. at Late Kai. Durga K. Banmeru Science College, Lonar.

978-620-2-52934-1

LAMBERT Academic Publishing



Dashrath Chavhan
Santosh Agarkar

Fundamental concepts of Chromatography

Dr. D. M. Chavhan, M.Sc. (Chem), NET-JRF, Ph.D. working as Assistant Professor at Indira Mahavidyalaya, Kalamb, Dist. Yavatmal India. He has 12 years of Teaching experience and published 2 books.

Dr. S.V. Agarkar, Ph.D.(Chemistry, Education and Civil Engineering) working as Principal at Ralegaon. He has 27 years' experience and published 7 books.

LAMBERT Academic Publishing

International Journal for Multidisciplinary Research
International Conference on Multidisciplinary Research & Studies 2023
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Challenges and Opportunities for Online Education in India

A.Y.Shaikh[1], P.R.Jagtap[1&], S.V.Jadhav[1&], B.H.Bhatti[1#]

[1,2,3]Department of Mathematics, Indira Gandhi Kala Mahavidyalaya, Ralegaon-445402, India.

Abstract

The roles and skills of instructors in online learning serve as a framework for the creation of programmes for teacher training and preparation. The disadvantage of online education is that these issues—empowering online teachers, encouraging critical reflection, and incorporating technology into pedagogical inquiry—are not adequately addressed. A different viewpoint views teachers as adult learners who continuously change the importance of the structures associated with online teaching through a continuous process of reflection and action. The goal of the current study is to examine the effects of mandating eLearning to support teaching and learning procedures in higher education following this historic epidemic and to pinpoint the biggest obstacles and opportunities the users confront.

Introduction

Online learning and computer-assisted education have somewhat fused in recent years, evolving into what are frequently referred to as blended- or personalized-learning approaches. One of the sectors most severely affected by the COVID-19 pandemic was the education sector, with institutions struggling to find ways to remain open. Online learning resources have become invaluable during these trying times. Significant technological advancements have been made as a result of the explosive growth in investments in EdTech tools during the past two years, particularly in the online education sector. There are many advantages to online education, including mobility, accessibility, a need for less physical infrastructure, fewer prices, and more flexibility. However, that does not mean that it is without flaws. According to a recent survey, 60% of students who had just switched to an online learning system found the experience to be monotonous and found it difficult to stay motivated to pay attention in class. The development of technology has significantly altered practically every aspect of existence. The educational process has been altered by technology as well. In the past ten years, there has been a notable change in face-to-face schooling. Even while in-person instruction is still the norm, acceptance of online courses is growing in the management and engineering fields. A few factors contributing to the exponential rise of online education are its immediacy, accessibility from any location, self-direction, and mobility.

Technical Challenges and Digital Literacy

Even while the younger generation is adept at using computers, this does not equate to digital literacy. It is quite difficult to learn how to use many pieces of software effectively when using an online learning system. Additionally, students must be aware of their rights and obligations in an online learning environment as well as proper online communication protocol. A bigger issue is the ongoing technological difficulties that teachers and students encounter on these sites. The flow of learning is frequently interrupted by these issues since they frequently require technical assistance to fix.

The Advantages of Online Education

Even conventional colleges and universities have begun implementing online teaching/learning strategies. Those who are unfamiliar with the idea of online learning could be uncertain about whether to choose it or not. In order to provide you a better knowledge of this type of education, we have listed a few points below that describe the advantages and difficulties of online learning. Faculty and students benefit from increased convenience, access, and flexibility to the courses thanks to online learning. Trainers and students do not need to drive to specific sites in poor weather because these courses can be taken and given from anywhere, at any time. For all students in the classroom, online education fosters an engaging and dynamic environment, and it is especially useful for those who are uncomfortable raising their hands. At the conclusion of online courses, many teachers have noticed that students tend to engage in more substantive conversations on significant

Chapter 9

UV- VISIBLE SPECTROSCOPY: BASIC CONCEPTS

YOGESH I. BIRADAR,[2] BAJARANG R. BHOSALE &[3] VITTHAL B. MAKANE[1]

[1]Department of Chemistry, Indira Gandhi Kala Mahavidhyalaya, Ralegaon, Dist. Yavatmal-445402(M.S), India.
[2]Department of Chemistry, Shri Vasantrao Naik Mahavidyalaya, Dharni, Dist. Amravati- 444702(M.S), India.
[3]Department of Chemistry, C. B. Khedgi's Basaveshwar College, Akkalkot, Dist. Solapur- 423216(M.S), India.
*Corresponding Author: Y. I. Biradar, Email: biradaryogi2909@gmail.com

INTRODUCTION

What is spectroscopy? Spectroscopy is nothing but the study of how electromagnetic radiations interact with matter. Each interaction can give us different insights into the properties of the subject, and using different energies can provide different information. The most exciting part of spectroscopy is predicting the chemical makeup of unknown compounds. There are lots of ways to do this, from physical methods like boiling point and melting point to chemical methods like unsaturation testing and functional group testing. All types of electromagnetic radiation travel at the same speed, but they have different frequencies and wavelengths. The two types of electromagnetic radiation have a dual nature - wave and particle. We know that particles have a particle nature because the energy of certain types of radiation is stored in tiny packets called photons. Every photon has its own energy, and the different kinds of radiation are determined by how much energy they contain. The energy of certain electromagnetic radiation is related to its frequency ($E = h\upsilon$), and the photons with the highest energy are the ones with the longest wavelengths.

Spectroscopy is a great way to figure out what's in a substance, and it can be used for a bunch of different types of stuff like UV and IR, as well as other types like NMR and Raman. As we know spectroscopy is the study of how electromagnetic radiations interact with matter, depending on the nature of the interaction. There are several possible processes that can occur, such as absorption, emission, and elastic scattering and reflection.

1. Absorption is the process of the absorption of energy from a radiative source by a material. he extent of absorption is determined by the proportion of energy that passes through the material, and absorption will reduce the amount of energy that is

Dr. Sanjay B. Nagdeote M.Sc., Ph.D., SET & SET, B.Ed., currently working as a Associate Professor in the Department of Physics, Amolakchand Mahavidyalaya Yavatmal. He has 17 years teaching experience including UG& PG Level. He has Publish 17 research articles in various National and International Peer reviewed Journals having good impact factor. He is recipient of fellowship under FDP of UGC, New Delhi for Research. **(Editor and Author)**

Mr. Kapil D. Jagtap M.Sc., B.Ed., SET, currently working as Assistant Professor and Head in the Department of Physics, Indira Gandhi Kala Mahavidyalaya, Ralegaon, Dist. Yavatmal. He has 6 years of teaching experience under UG level. He has published 2 papers in peer reviewed national and international journals. He is life time member of Society for Technologically Advanced Material of India (STAMI).

Dr. Anand S. Kakde M.Sc., Ph.D., PGD in Nanotechnology, working as a Assistant Professor in the Department of Physics, Amolakchand Mahavidyalaya, Yavatmal. He has 12 years of teaching experience including UG and PG level. He had also worked as Research Associate in Department of Nanoscience & Nanotechnology, UGC sponsored project at Dr. Ambedkar College, Nagpur. He has published 10 research papers in different peer review journals having good impact factor. He had received best paper award several times at various National and International Conferences. He is life time member of Society for Technologically Advanced Material of India (STAMI).

Dr. Pratik M. Wankhade M.Sc., M.Phil., Ph.D., currently working as a Assistant Professor and Head in the Department of Physics, Late Rajkamalji Bharti Arts, Commerce and Smt S.R.Bharti Science College, Arni. He has 10 years of Teaching experience under UG level. He has publish 15 research papers published in national and international peer review journals having good impact factor. He is recognized supervisor of SGBAU for Ph.D.

Mr. Devidas S. Chavhan M.Sc., M.Phil., currently working as associate professor and Head in the Department of Physics, Amolakchand Mahavidyalaya, Yavatmal. He has 13 years of teaching experience at UG and 5 years at PG level. He is one of the author of 3 reference books published for UG students. **(Editor)**

₹

SAI JYOTI PUBLICATION
Phone : 9764673503, 99235935
email : sjp10ng@gmail.com
Website: www.saijyoti.in

Om Sai Publishers & Distributors
Mob. No. : 9923693506
E-mail : ospdnagpur@gmail.com

Available Also on amazon

Text Book of Physics Optics, Laser and Renewable Energy Sources

AS per the Syllabus of Sant Gadge Baba Amravati University, Amravati

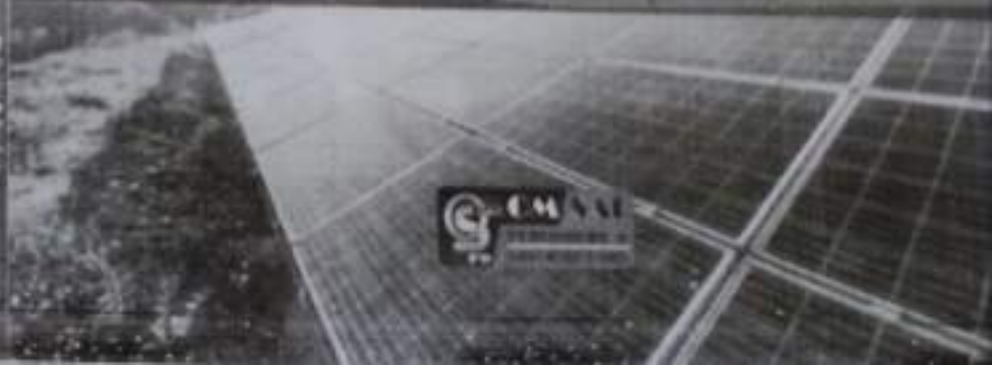
Text Book of

Physics

Optics, Laser and Renewable Energy Source

B.Sc. Part-II (Fourth Semester)

Dr. Sanjay B. Nagdeote
Mr. Kapil D. Jagtap
Dr. Anand S. Kakde
Dr. Pratik M. Wankhade
Mr. Devidas S. Chavan



Innovation in Science and Technology to Achieve Sustainable Development Goals

A. S. Lihitkar
Department of Physics,
Indira Gandhi Kala Mahavidyalaya,
Ralegaon-445402.(M.S.), India.

K. D. Jagtap
Department of Physics,
Indira Gandhi Kala Mahavidyalaya,
Ralegaon-445402.(M.S.), India.

B. H. Bhatti
Department of Physics
Indira Gandhi Kala Mahavidyalaya,
Ralegaon-445402.(M.S.), India.

Abstract

United Nations Sustainable Development Summit adopted 17 Sustainable Development Goals to achieve by 2030. These United Nations is consisting of 193 nations i.e. almost a whole world is working towards to attain these goals. Doing so they invest in resources, funding, time and technology which generates opportunities for researchers and scientific community around these goals. This chapter talks about some key research trends that address some of these goals.

I. Introduction

In September 2015, United Nations Sustainable Development Summit held in New York agreed on 17 global Sustainable Development Goals (SDGs) targeted to achieve by 2030 [1, 2]. The Sustainable Development Goals are the outline to attain an improved and viable future for living and non-living that ever exist on the earth. The goals include [3];

- No poverty,
- Zero hunger,
- Good health and well being,
- Quality education,
- Gender equality,
- Clean water and sanitisation,
- Affordable and clean energy,
- Decent work and economic growth,
- Industry innovation and infrastructure,
- Reduced inequalities,
- Sustainable cities and communities,
- Responsible consumptions and production,
- Climate action,
- Life below water,
- Life on land,
- Peace, justice and strong institutions,
- Partnership.

IRJSE Int. Res. J. of Science & Engineering, Special Issue A8 July, 2020
ISSN: 2322-0015
SJIF Impact Factor 6.70
RESEARCH ARTICLE
OPEN ACCESS

Preliminary study on Environmental laws and sustainable development in India

Jagtap Kapil[1]*, Barde Rajesh[2] and Ade Ankush[3]

[1]Department of Physics, Indira Gandhi Kala Mahavidyalaya, Ralegaon, Yavatmal, MS, India
[2]Department of Physics, Govt. Vidarbha Institute of Science and Humanities, Amravati , India
[3]Department of Zoology, Indira Gandhi Kala Mahavidyalaya, Ralegaon Yavatmal , MS India
*Correspondence: Mr. Kapil D. Jagtap Email: kapil.dj358@gmail.com

Manuscript Details
Available online on https://www.irjse.in
ISSN: 2322-0015

Editor: **Dr. Arvind Chavhan**

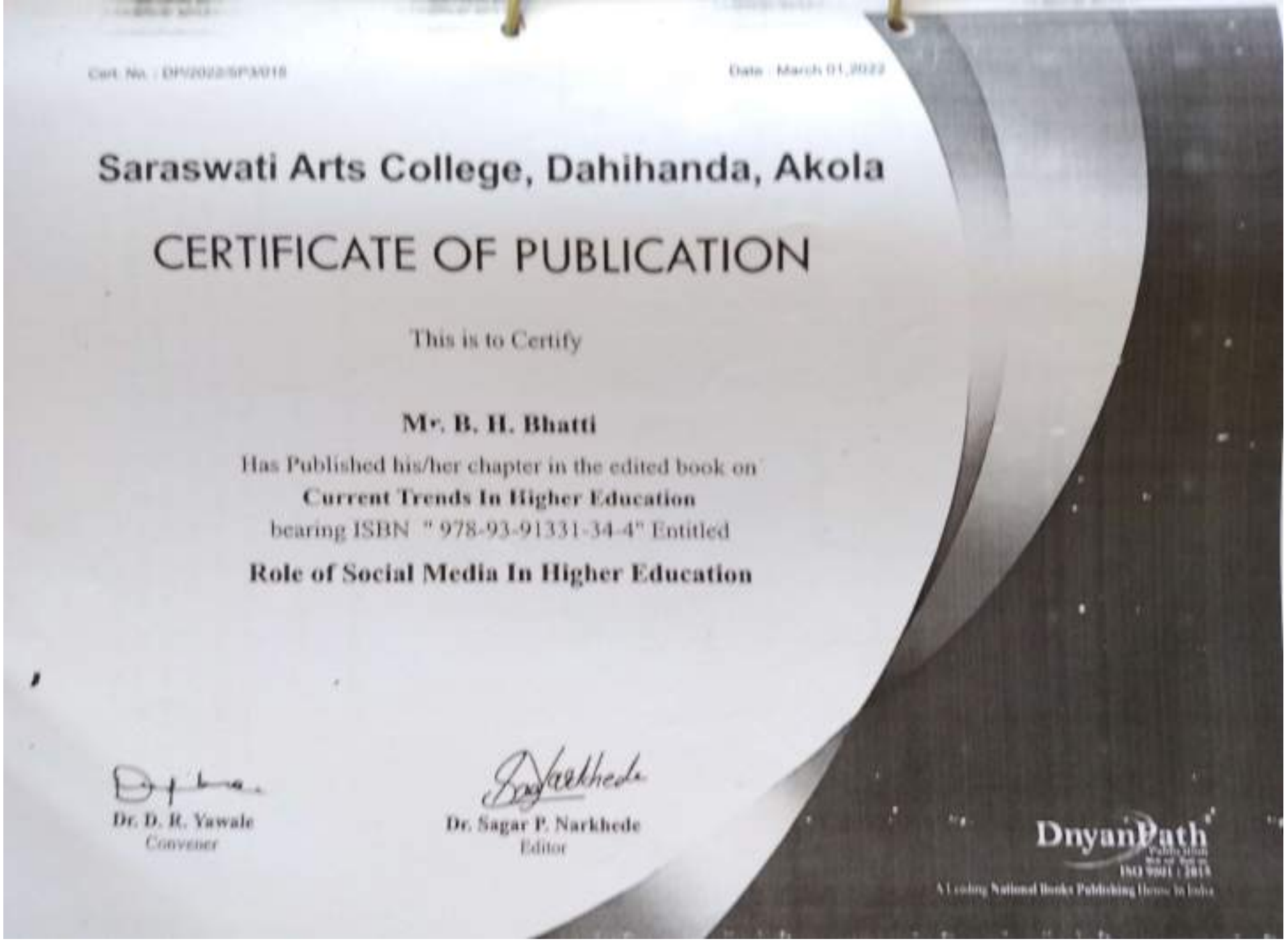
Cite this article as:
Jagtap Kapil, Barde Rajesh and Ade Ankush. Preliminary study on Environmental laws and sustainable development in India, *Int. Res. Journal of Science & Engineering*, 2020, Special Issue A8: XX-XX

Article published in Special issue of International e-Conference on "Sustainable Development : A Biological and Socioeconomical Perspective" organized by Government Vidarbha Institute of Science and Humanities Amravati, Maharashtra, India date, June 26-27, 2020.

Abstract

Environmental law is a collective term encompassing aspects of the law that provide protection to the environment. This paper studies the relation between environmental protection laws and the sustainable development of the India. To accomplish this objective, this paper focusses the environmental challenges in our country, and disapprovingly inspects some environmental laws to decide their realism and productivity in dealing with environmental difficulties. The paper contends that due to the privatization of the various field in India, and its resultant use by those in power to promote private gains, the country has not shown serious concerns for the environment. This lack of concern is reflected in the weak environmental laws and the lack of their enforcement. The paper concludes that the laws have failed to protect our environment, and the resultant environmental degradation has impeded the sustainable development of the region. Good governance is suggested as the most likely solution. I accomplish that tough environmental policy inclosing and directive are critical in this situation if novel deliberate cities in India are to have any probable in talking the challenges of quick expansion and sustainable development. This paper sets out to examine the latter view, and examines its implications on sustainable development.

Keywords: Environmental law, Sustainable Development, Urbanisation, Pollution, Society, Governance.



Cert. No. : DP/2022/SP/3018

Date : March 01,2022

Saraswati Arts College, Dahihanda, Akola

CERTIFICATE OF PUBLICATION

This is to Certify

Mr. B. H. Bhatti

Has Published his/her chapter in the edited book on

Current Trends In Higher Education

bearing ISBN " 978-93-91331-34-4" Entitled

Role of Social Media In Higher Education

Dr. D. R. Yawale
Convener

Dr. Sagar P. Narkhede
Editor

DnyanPath
Publication
ISO 9001 : 2015
A Leading National Books Publishing House in India

Cert. No. : DP/2022/SP3/014

Date : March 01,2022

Saraswati Arts College, Dahihanda, Akola

CERTIFICATE OF PUBLICATION

This is to Certify

Mr. K. D. Jagtap

Has Published his/her chapter in the edited book on

Current Trends In Higher Education

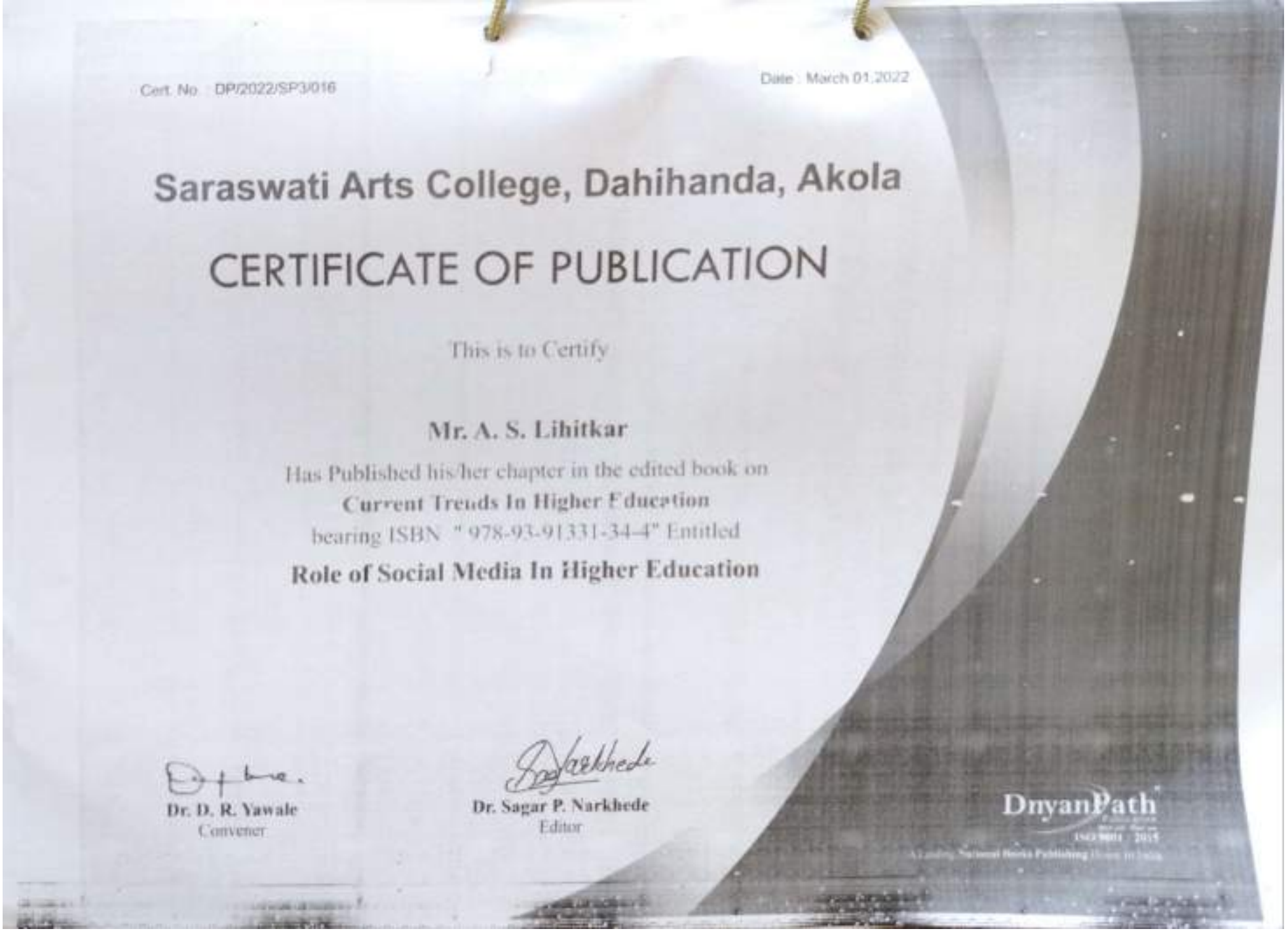
bearing ISBN " 978-93-91331-34-4" Entitled

Role of Social Media In Higher Education

Dr. D. R. Yawale
Convener

Dr. Sagar P. Narkhede
Editor

DnyanPath



Cert. No : DP/2022/SP3/016

Date : March 01,2022

Saraswati Arts College, Dahihanda, Akola

CERTIFICATE OF PUBLICATION

This is to Certify

Mr. A. S. Lihitkar

Has Published his/her chapter in the edited book on

Current Trends In Higher Education

bearing ISBN " 978-93-91331-34-4" Entitled

Role of Social Media In Higher Education

Dr. D. R. Yawale
Convener

Dr. Sagar P. Narkhede
Editor

DnyanPath

13

Impact of ICT in Teaching, Learning and Evaluation Process

A. Y. Shaikh
Department of Mathematics, Indira Gandhi Kala Mahavidyalaya, Ralegaon.(M.S.).India.

S. V. Jadhav,
Department of Chemistry, Indira Gandhi Kala Mahavidyalaya , Ralegaon.(M.S.).India.

B. H. Bhatti

A. S. Lihitkar
Department of Physics, Indira Gandhi Kala Mahavidyalaya , Ralegaon.(M.S.).India.

Abstract:

Themanuscript devotes the appropriate study on the use of information and communicrtion technology (ICT) in teaching, learning and evaluation process. In education, ICT show dynamic characters in enabling teaching, learning and evaluation process. ICT tools have altered classroom communiquéapproaches and adapted instruction tactics. Also, ICTs have made teaching and learning interactive and collaborative instead of the outmoded teacher- speaking and students attendingstyle.We strained toelucidate all characters of ICT for additional variations.

A MultidisciplinaryApproach to Higher Education / Volume II

Edited By

Dr. Vikrant R. Wankhade, Dr. Khushal J. Alaspure

Dr. Akash V. More, Dr. Shrikant S. Mchulkar

Published by the **DnyanPath Publication (INDIA)**

A Leading **National Books Publishing** House In India

The First edition published in April, 2024

ISBN 13 : 978-81-972505-0-7

ISO 9001 : 2015

ज्ञानपथ पब्लिकेशन

Visit us

www.dnyanpath.com

Reg. Office	:	FFS-A, Block C,First Floor, Venus Plaza, Shegaon Naka, V.M.V. Road, Amravati - 444 603 (MH)
Branch Office	:	Kalash Apartment, Near Gulmohar Holl, Pande Layout Khamla Nagpur - 440 025 (MH)
Visit us	:	www.dnyanpath.org
Contact us	:	dnyanpathpub@gmail.com
Phone	:	08600353712, 09503237806

Printed at Shri Gurudeo Printers, Amravati.

Mahatma Fule Sankul, Shegaon Naka,

V.M.V. Road, Amravati - 444603 (Maharashtra)

₹ : 700/-

Scanned with ACE Scanner

ISBN : 978-81-19931-25-5

21

Advances and Perspectives in Nanotechnology: A Short Review

R B Butley*[1], R V Joat[1], G T Lamdhade[1], K B Raulkar[1], A O Chauhan[1], C C Jadhao[1], B.H. Bhatti[1]

[1]Department of Physics, Vidya Bharati Mahavidyalaya, Amravati(M.S.), India

Corresponding Author : Email :- butley@gmail.com

Abstract:

The process of modifying the shape and size of structures, electronics, and systems at the nanometer scale, i.e., 1 nm to 100 nm (10-9m), is known as nanotechnology. The prefix nano derives from the Greek word "nano," which meaning "very little". Because of their small size, they have larger surface areas than bulk forms, better reactivity, and the ability to control numerous features. These unique qualities have fueled the expansion of nanoscience and the use of nanoparticles in a variety of sectors such as biomedicine, cosmetics, electronics, food analysis, environmental and remediation, and painting. Nanoscale science and engineering enable us to understand and control matter at the atomic and molecular levels [1,2].

Brief overview of nanotechnology's historical development

Nanotechnology's historical development traces back to a series of theoretical concepts and experimental observations. Here's a brief overview:

1. Early Concepts (1950s-1960s):

The term "nanotechnology" was first coined by physicist Richard Feynman in his 1959 lecture, "There's Plenty of Room at the Bottom," where he discussed the possibilities of manipulating individual atoms and molecules. Physicist Eric Drexler expanded on these ideas in the 1980s with his book "Engines of Creation," envisioning nanoscale machines and their potential applications.

2. Scanning Tunneling Microscopy (1981):

The development of the scanning tunneling microscope (STM) by Gerd Binnig and Heinrich Rohrer in 1981 revolutionized nanotechnology. It allowed researchers to visualize and manipulate individual atoms, opening the door to nanoscale exploration.

3. Fullerenes and Nanotubes (1985):

In 1985, the discovery of fullerenes (buckyballs) by Robert Curl, Sir Harold Kroto, and Richard Smalley introduced a new class of nanomaterials. Later, carbon nanotubes, cylindrical structures with remarkable properties, were identified.

4. Development of Nanolithography (1980s-1990s):

Advancements in nanolithography techniques, such as electron-beam lithography and photolithography, enabled precise control over nanoscale structures. This was crucial for the fabrication of nanodevices.

5. Nobel Prize in Chemistry (1996):

The Nobel Prize in Chemistry was awarded to Robert Curl, Sir Harold Kroto, and Richard Smalley for their discovery of fullerenes. This recognition significantly boosted interest and research in nanotechnology.

ISBN : 978-81-19931-25-5

20

Humidity Sensors: $AlCl_2$-Dipped Nanocrystalline Magnesium Oxide

R B Butley*[1], R V Joat[1], G T Lamdhade[1], K B Raulkar[1], A O Chauhan[1], C C Jadhao[1], B.H. Bhatti[1]

[1]Department of Physics, Vidya Bharati Mahavidyalaya, Amravati(M.S.), India

Corresponding Author:Email-ra.butley@gmail.com

ABSTRACT

The investigation, magnesium oxide and AlCl2 were combined in varying mol% w/w stoichiometry. Thick layers of humidity sensors are made using the screen printing method. After testing every humidity sensor device, it was determined that the sample T-1, which was kept at a constant temperature between 400 and 700 degrees Celsius, had a high sensitivity and a quick response time to humidity sensing at room temperature. Curves in the case of conductivity are often jumbled and congested. Relative humidity has a linear effect on sample film conductivity. When sensors are kept at room temperature and their surface oxygen vacancies operate as electron donors, the resistance of thick films reduces.

KEYWORDS: Thick films, MgO-$AlCl_2$, Sensitivity, and Humidity sensors.

1. INTRODUCTION

The operator can manage the temperature and relative humidity in these humidity chambers at predetermined levels via the front panel.[1-4] The chamber's air is continuously circulating, scheduled to be compared to predetermined points. Electric resistance heaters, which regulate temperature by turning on and off, produce heat. There is a refrigeration unit that runs constantly on units with cooling. A low-pressure vapor generator injects water vapor into the chamber via a tiny opening to achieve chamber humidification. At the blower discharge, the water vapor enters the chamber. Test chambers were programmable, and they could be networked or connected to the Internet. The goal of the current work is to create and characterize the structure of magnesium oxide nanoparticles using the liquid phase method, which has the advantage of producing a greater surface area in a shorter amount of time at room temperature. This approach is also the most straightforward, economical, and environmentally benign. Through XRD analyses of MgO nanoparticles, its impact on the nanocrystalline size structure is also investigated.[5–12]

2. EXPERIMENTAL METHOS:

All of the chemicals utilized in this work were 99.99% pure GR grade chemicals that were bought from Sd-fine chemicals, India. The sol-gel technique is utilized to synthesize MgO nanoparticles. There are several processes involved in the synthesis of MgO nanoparticles, including stirring, drying, filtration, mixing, and calcination. Ultimately, the powder is calcined for three hours at 300 °C to produce MgO in the form of nanoparticles.

In screen printing, a mesh is used to transfer ink onto a substrate, with the exception of places blocked with a blocking stencil to prevent ink from penetrating such areas. In order to fill the gaps in the mesh with ink, a substance or gel is pushed over the screen, and vice versa, causing the screen to briefly make contact with the substrate along a line of contact. When the screen springs back after the blade has passed, the material gets moist on the substrate and is drawn out of the mesh holes. Similar to this, we utilize glass slides as the substrate and a paste made of nanomaterials in place of ink. Thus, instead of using the glass slide that we are using here, we are using mesh that has a less permeable stencil area. First, we take the 90% nanomaterial and use a solid binder (10%) called ethyl cellulose to build a paste out of it. Drop by drop, liquid binder is added to a well-ground mixture of nanomaterial and solid binder. Making sure the right amount of liquid binder is added requires caution. Thus, the ideal thick nanomaterial paste is made. Next, we proceed to apply a paste made of permeable mesh for well-layered nanomaterials to substrates (glass slides) using a squeegee. First, we let these thick

ISBN : 978-81-19931-35-5

5

Photovoltaic applications of SnO_2 gas sensor

B.H.Bhatti [1*], K.B.Raulkar [2], G. T. Lamdhade [3], A. O. Chauhan[4], R. B. Butley[5], C. C. Jadhao[6], A. B. More[7]

[1,2,3,4,5,6,7]Department of Physics, Indira Gandhi Mahavidyalaya, Ralegaon District- Yavatmal (445402), Maharashtra, India
[1,2,3,4,5,6,7]Department of Physics, Vidya Bharati Mahavidyalaya, C. K. Naidu Road, Camp, Amravati (444602), Maharashtra.
*Corresponding Author: bhushanbhatti80@gmail.com

Abstract

Tin oxide is a remarkable chemical in today's research because to its unique electrical and optical properties. Because of its huge band gap (3.6 eV), it is used as a core material in a wide range of important applications, including optoelectronics, spintronics, photovoltaics, thin-film transistors, photocatalysis, dielectrics, sensors, and transparent electronics. Thin film technology provides various advantages in the solar industry, including low cost, low material and energy consumption, and ease of use. Solar cells made from SnO_2 thin films have the potential to open up new technical paths for power production, with conversion efficiencies ranging from 15% to 20%. The authors examine and outline potential areas of SnO_2 research for photovoltaic and gas sensor applications. The data obtained will indicate the possibility of designing physical, chemical, magnetic, and optical characteristics of SnO_2 for sensing and photovoltaic applications.

Keywords: Tin oxide, Photovoltaic, Thin film, Gas sensors.

1. Introduction

Material science is the systematic investigation of any material to determine its varied characteristics and qualities. It covers a wide variety of applications, from manufacturing nanoscale gadgets to developing novel materials at the atomic level. In the current context, we are dealing with a number of difficulties linked to traditional energy sources, global warming, soil and water contamination, climate change, sanitation, and so on. Our primary objective is to alleviate these issues by bringing new technologies and advanced materials. Nanotechnology and thin films play an essential role in dealing with such challenges. As stated by [1], this can be used to enhance the performance of currently used materials and develop new functional materials. This is because they not only offer good opportunities to study the optical, electrical, and thermal properties in quantum confinement, but they also provide crucial understandings of the functional units involved in the fabrication of nanoscale electronic, optoelectronic, and magnetic devices.

ZnO, TiO_2, and SnO_2 are the most studied metal oxides due to their unique global uses. Tin oxide is the best option for photovoltaic investigations since it is plentiful, affordable, and non-toxic. The primary goal of this research is to learn more about the functioning of SnO_2 and to identify potential research topics for future applications in photovoltaics and gas sensors [2].

2. Overview of Tin Oxide and its Properties

From the past several decades semiconducting (Metal) oxides such as ZnO, TiO_2 and SnO_2 have been demonstrated to be an essential class of transparent conducting oxides (TCO) for use in solar cells and gas sensors. Tin oxide is the most common material used in optoelectronics because to its low electrical resistance and high transmittance in the visible range [3]. Tin oxide is a good option for these uses due to its large band gap (3.6 eV) and strong excitation binding energy (130 MeV). It is the only group-IV oxide that exhibits transparent properties and excellent conductivity in the visible range of (300–800 nm). Bulk

A Multidisciplinary Approach to Higher Education / Volume I

Edited By
Dr. Vikrant R. Wankhade, Dr. Khushal J. Alaspure
Dr. Akash V. More, Dr. Shrikant S. Mahulkar

Published by the **DnyanPath Publication (INDIA)**
A Leading **National Books Publishing** House In India
The First edition published in April, 2024

ISBN 13 : 978-81-972505-6-9

ISO 9001 : 2015
ज्ञानपथ® पब्लिकेशन

Visit us
www.dnyanpath.com

Reg. Office	:	FFS-A, Block C,First Floor, Venus Plaza, Shegaon Naka, V.M.V. Road, Amravati - 444 603 (MH)
Branch Office	:	Kalash Apartment, Near Gulmohar Holl, Pande Layout Khamla Nagpur - 440 025 (MH)
Visit us	:	www.dnyanpath.org
Contact us	:	dnyanpathpub@gmail.com
Phone	:	08600353712, 09503237806

Printed at Shri Gurudeo Printers, Amravati.
Mahatma Fule Sankul, Shegaon Naka,
V.M.V. Road, Amravati - 444603 (Maharashtra)

₹ : 700/-

Nutritional Requirements of Athletes and Pre-and Post Match Diet

Dr. Kiran G. Pawar
Director of Physical Education & sports
Indira Gandhi Kala Mahavidhyalay
Tq.Ralegaon, Dist. Yavatmal
Email : kiran7pawar@gmail.com

Dr. Jaswant Singh
GDC Goda
Email : jaswantsingh626@gmail.com

Abstract :

Holistic nutrition is gaining recognition as a crucial component in optimizing athletic performance and overall well-being. This abstract explores the integration of holistic nutrition principles into athletic training programs, emphasizing a comprehensive approach to address the diverse needs of athletes. By considering not only macronutrient and micronutrient intake but also factors such as meal timing, hydration, and individualized dietary plans, athletes can achieve enhanced performance, improved recovery, and reduced risk of injury. Incorporating holistic nutrition into athletic training programs involves collaboration among coaches, nutritionists, and other healthcare professionals to develop personalized dietary plans tailored to athletes' specific needs and goals. Moreover, the abstract discusses the significance of education and ongoing support in fostering sustainable dietary habits among athletes.

Introduction :

In the realm of athletic training and performance enhancement, the role of nutrition has evolved beyond mere fuel provision to encompass a holistic approach that considers the interconnectedness of various physiological, psychological, and environmental factors. Holistic nutrition recognizes that optimal athletic performance is not solely determined by macronutrient ratios and calorie counts but also by the quality, timing, and individualized nature of dietary intake. This introduction sets the stage for exploring the various dimensions of holistic nutrition in athletic training programs, from the scientific basis of nutrient metabolism to practical strategies for implementation and ongoing support. By examining nutrition through a holistic lens, we aim to empower athletes to achieve their full potential, not only as competitors but also as individuals striving for holistic well-being.Athletes are constantly pushing the boundaries of human performance, striving to achieve their utmost potential in their respective sports. considering not only the macronutrient and micronutrient composition of foods but also the broader aspects of dietary quality, timing, and individualization.

The Athletes Diet :

Athletes engaged in daily sports training require a well-balanced diet that provides the necessary energy, nutrients, and hydration to support their training intensity, promote recovery, and optimize performance.

- **Carbohydrates :** Carbohydrates are the primary fuel source for high-intensity exercise and should comprise a significant portion of an athlete's diet. Aim to consume complex carbohydrates from sources such as whole grains, fruits, vegetables, and legumes, with higher carbohydrate needs on days of intense training or competition.
- **Protein :** Protein is essential for muscle repair, growth, and recovery, especially after strength training or endurance exercise. Include high-quality protein sources in each meal, such as lean meats, poultry, fish, eggs, dairy products, legumes, tofu, and plant-based protein sources.
- **Fats :** Healthy fats play a role in providing sustained energy, supporting cellular function, and aiding in the absorption of fat-soluble vitamins. Incorporate sources of unsaturated fats, such as avocados, nuts, seeds, olive oil, and fatty fish like salmon and mackerel, into the diet.
- **Micronutrients :** Ensure adequate intake of vitamins and minerals essential for overall health and performance, including vitamin D, calcium, iron, zinc, magnesium, and antioxidants. Consume a variety of fruits, vegetables, whole grains, nuts, seeds, and lean proteins to meet micronutrient needs.
- **Hydration :** Hydration is critical for maintaining fluid balance, regulating body temperature, and supporting performance and recovery. Drink water regularly throughout the day, aiming for at least 8-10 cups (64-80 ounces) per day, or more depending on sweat rate, climate, and training duration.

Nutrition for Sportsmen :

- **Macronutrients :** Athletes require a balanced intake of carbohydrates, proteins, and fats to fuel

Cert. No. : DP/2023/SP2/034

June, 2023

Saraswati Arts College,
Dahihanda, Akola

CERTIFICATE OF PUBLICATION

This is to Certify

Dr. K. G. Pawar

Has Published his/her chapter in the edited book on

Physical Education and Sports: Issue, Challenges and Opportunities / Volume II

bearing ISBN "978-81-19435-00-5" Entitled

Impact of advanced training using technology after Pandemic

Dr. Dipak K. Raut
Principal

Dr. Sagar P. Narkhede
Editor

ज्ञानपथ पब्लिकेशन

A Leading National Books Publishing House in India

Impact of advanced training using technology after Pandemic

Dr. K. G. Pawar
Director of Physical Education,
Indira Gandhi Kala Mahavidyalaya,
Ralegaon

Dr. Jaswant Singh
Physical Training Instructor
Govt. Degree College Chatroo,
Kishtwar

Abstract:

The paper deals with the study of the technological impact during the COVID-19 pandemic and elucidates technology usage to technology-enhanced learning which assisted in enhancing the behavioral intention to use technologies among the sports students. Recently, higher education institutions suffered from the impact of using emerging technologies with electronic learning during the COVID-19 pandemic for improving student academic performance in a sports. The main purpose of this study is to determine the impact of technology-enhanced learning that allows the students to use emerging technologies and software to develop their skills and improve their academic performance.

Introduction:

Physical education is the planned, progressive literacy that takes place in academy class timetabled time and which is delivered to all pupils. This involves both 'literacy to move' (i.e. getting more physically competent) and ' moving to learn '(e.g. learning through movement, a range of chops and understandings beyond physical exertion, similar ask-operating with others). The environment for the literacy is physical exertion, with children passing a broad range of conditioning, including sport and cotillion.

Sports in academy aid brain development and boost pupils" cognitive capacities. Active participation in sports may help scholars decompress from their everyday pattern of studying and lessen test stress. To keep the body and spirit in harmony, one must strike a balance between work and recreation. Sports are an extension of the classroom for trainers. Sports may educate a person how to be physically and mentally strong. Sports are a big part of numerous athletes' lives. To be successful, athletes have to train hard for hours every day. Training is important because it helps athletes get stronger and briskly. It also teaches athletes how to work more with their teammates on the field or court. Training is an integral part of athletes' lives. It's what allows them to be their stylish and contend with all that they have. Training can help with abidance, skill development, weight loss pretensions, injury forestallment, and much further. thus, athletes should no way neglect their training. Without training, it would be veritably delicate for athletes to contend duly. Training takes a lot of time and trouble, but it's worth every alternate put into it because training has so numerous benefits for athletes. For illustration, baseball players will profit from training because they can work on enhancing the exit haste of the baseball, ameliorate their fur speed, and work on their dexterity. This way, they will be more confident when it comes to joining events.

The significance of Training for Athletes

Training is extremely important and should form an integral part of all elite athlete's diurnal routines. Training allows the body to gradationally make up strength and abidance, ameliorate skill situations and make provocation, ambition and confidence. Training also allows athletes to gain further knowledge of their sport as well as enabling them to learn about the significance of having a healthy mind and body. In terms of physical goods of training, regular exercise increases muscle tone, facilitates good rotation, improves strength, dexterity and inflexibility and improves the rate of waste product disposal. Regular training also speeds up recovery time following physical exercise; this enables the body to manage with the demands of training more effectively and makes it more resistant to injury and illness. Training also has benefits for internal health as it improves attention and increases tone-regard. Training can be veritably demanding for athletes because training pushes athletes to give their stylish all the time. Athletes might not want to do the training

Recent Advances in Educational Technology

Dr. K.G. Pawar
Director of Physical Education,
Indira Gandhi Kala Mahavidyalaya,
Ralegaon.

Dr. Jaswant Singh
Physical Training Instructor Govt.
Degree College Chatroo, Kishtwar
Abstract:

Abstract :

Educational technology research has passed through a number of stages, focusing, in turn, on the content to be learned, the format of instructional messages, and the interaction between computers and students. Technology plays a very important role in helping everyone survive in this 21st century. Without it, one cannot imagine this world. As, it has grappled its way into our day-to-day lives, making its grasp tighter in every aspect. Ever since Covid-19 happened, technology has proved to be a boon for the educational sector. Educators realized the role of digitization a while ago but this pandemic gave it a sudden thrust and boost.

Introduction to Education Technology Trends :

In order to enhance teaching and learning, the field of research known as educational technology looks at the process of analyzing, designing, developing, implementing, and evaluating the instructional environment, learning materials, students, and the learning process. Because it enables modern teachers to incorporate new technologies and tools into their classrooms, educational technology in education is crucial. The learner-centeredness of the classroom can be enhanced by the teachers. It enables educators to interact with pupils in distinctive, original, and fair ways. Teachers can connect with other educators locally, nationally, and internationally to broaden their networks. Many educators pursue a master's degree in educational technology in order to advance their use of the technology in the classroom. They want to learn how to better integrate the use of devices, how to conduct classes partially or entirely online, and how to increase student engagement and achievement. In addition to learning all of these abilities and more, they also learn how to coach their peers to improve their teaching and how to use research-supported teaching practices.

Definition of Educational Technology

1. It is a systematic, iterative process for designing instruction or training used to improve performance" (Encyclopedia of Educational Technology)
2. Educational Technology (Information Technology) according to
   a) Teaches with technology (uses technology as a tool)
   b) Primarily concerned with the narrow spectrum of information and communication technologies
   c) Primary goal: To enhance the teaching and learning process International Technology Education Association "Educational Technology is the systematic application of scientific knowledge about teaching-learning and conditions of learning to improve the efficiency of teaching and training (Leitch, 1967)

At the Micro Level

1. To identify and examine the traits and educational requirements of the students.
2. To identify the precise learning goals for the class and articulate them in behavioural terms.
3. To evaluate the instruction's substance and arrange it in the right order.
4. To list the resources and teaching-learning materials that are available.

Cert. No. : DP/2023/SP3/007 June, 2023

Saraswati Arts College,
Dahihanda, Akola

CERTIFICATE OF PUBLICATION

This is to Certify

Dr. K.G. Pawar

Has Published his/her chapter in the edited book on
Higher Education Issue Challenges and Opportunities
bearing ISBN "978-81-19435-01-2" Entitled

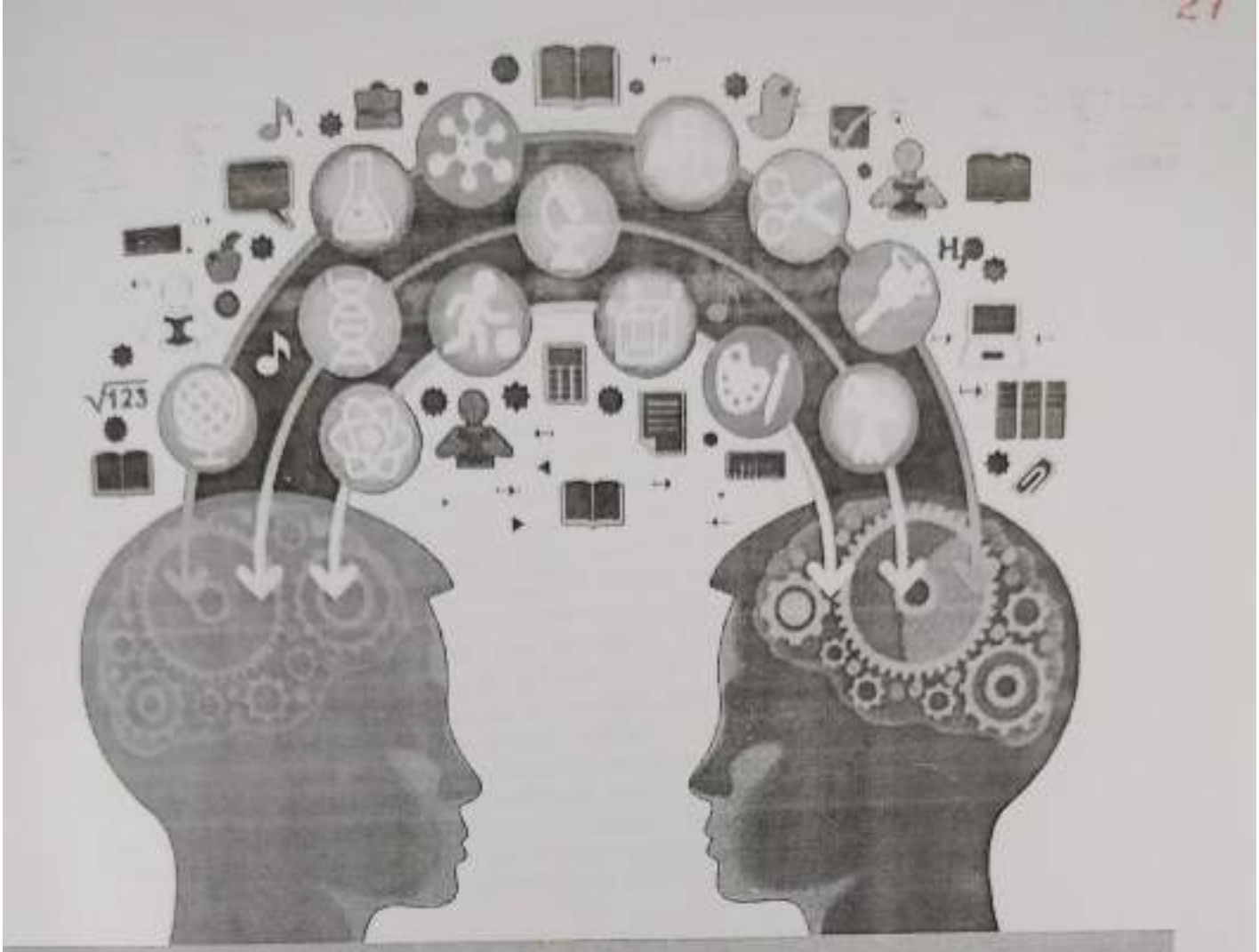
Recent Advances in Educational Technology

Dr. Dipak K. Raut
Principal

Dr. Sagar P. Narkhede
Editor

ज्ञानपथ

A Leading National Books Publishing Home in India



Innovative Research Trends in Science and Humanities

Dr. Ninad S. Dharkar
Dr. Kishor P. Suradkar
Dr. Suruchi R. Kadu
Dr. Dasharath M. Chavhan
Dr. P. B. Ingle

Technology and Innovation in Sports

Dr. Kiran G. Pawar
Indira Gandhi Kala Mahavidhyalaya
Tq.Ralegaon,Dist.Yavatmal (M.S.)
Kiran7pawar@gmail.com

Dr. Jaswant Singh
Physical Training Instructor,
Govt Degree College
Chatroo(J&K)

I. Introduction

In India traditionally, only a handful of channels had access to a variety of sports. Cable television had restrictions. But the use of technology has proved to be a big boon for sports in India. With the Covid-19 disease laying a halt on all sporting action around the world in early 2020, fans examined how long they will have to wait before seeing their favorites stars in action. Crickets, football, rugby, basketball, athletics, badminton, golf – all sports (except UFC) were put on hold as Covid-19 wreaked havoc all around the world. The bureaucrats chalked out plans for the return of sports in mid-2020. Eventually, it was absolute that sporting action will resume with some alterations. The biggest one being the non-participation of fans inside the arena. With Covid-19 still a big worry around the world, athletes played in empty arenas with the use of technology enhancing the viewing experience. Different leagues, different sports used different methods to increase engagement with fans. More live updates, social media updates, food delivery picking up, additional camera angles, VR headsets led to enhanced viewing experience and engagement. Testing times led to innovation. And innovation led to a boost in viewership. It is said in a Capgemini Research Institute report that 69% of fans report that the use of emerging technologies has enhanced their viewing experience – both inside and outside the stadium with India leading the way.

In India traditionally, only a couple of channels had access to supply sports events. Cable television had restrictions. But the use of technology has proved to be an enormous boon for sports in India There is a wide variety of sporting action available for the fans on their mobile phones as well as television. It is just not cricket that has seen a rise in viewership but football, MMA, wrestling, badminton, or basketball have also seen enhanced engagement. The Indian Premier League also saw a boost in the use of technology to increase the viewing experience for the fans. Stadium sounds were used, screens were put inside the stadium with fans cheering for their favorites teams while more content was available. It proved to be a hit as IPL 2020 became the most viewed tournament in its history. With the focus now shifting to all things digital, sports tech-based companies like FanCode benefited from the evolving fan preferences. For a company that was launched in March 2019, FanCode has already amassed over 1.5 crore+ app installs and is expected to continue its growth. "2020 has been a rollercoaster for sports federations and fans. The suspension of events across the world as necessary safety precautions has required federations and leagues to adapt like never before," Yannick Colaco, co-founder of FanCode, said. The outcome could be seen in the successful comeback of some of the biggest sporting events like IPL, Bundesliga, CPL, MLB, NBA who transformed the holistic experience offered to sports fans, which went beyond just the live broadcast on television. Simple yet impactful personalization like interactive live streaming and live scores, digital fan walls in stadiums, the launch of dedicated fan clubs and activations, online fantasy sports contests, and a lot of social media activity kept the fervor and brand recall consistent. These initiatives had some leagues and teams even claiming to have received the highest fan engagement levels experienced in their history. We expect this trend to continue even during a post-pandemic world, where sports fans and match-experience will go hand-in-hand, thereby remaining critical to the growth and

B.Sc. Third Year
Zoology, Paper - I

GENETICS

Madhya Pradesh Bhoj (Open) University, Bhopal
(Established under an Act of State Assembly in 1991)

मध्यप्रदेश भोज (मुक्त) विश्वविद्यालय, भोपाल

Kolar Road, Near Swarn Jayanti Park, Yashoda Vihar Colony,
Chuna Bhatti Bhopal, Madhya Pradesh-462016

ISBN 978-93-5453-478-2

COURSE WRITER

Dr. Sagar D. Dawada, Assistant Professor and Head, Department of Zoology, Indira Gandhi Kala Mahavidyalaya, Ralegaon, Maharashtra.

Published by Registrar, MP Bhoj (Open) University, Bhopal in 2020

Vikas® is the registered trademark of Vikas® Publishing House Pvt. Ltd.

VIKAS® PUBLISHING HOUSE PVT. LTD.
E-28, Sector-8, Noida - 201301 (UP)
Phone: 0120-4078900 • Fax: 0120-4078999
Regd. Office: A-27, 2nd Floor, Mohan Co-operative Industrial Estate, New Delhi - 110 044.
• Website: www.vikaspublishing.com • Email: helpline@vikaspublishing.com

ISBN: 978-93-91768-30-0

Recent Research at the Intersection of Science & Technology

Editors:

Dr. Ved Patki

Dr. Kailash Nemade

First Edition: March 2022

Bhumi Publishing

(ISBN: 978-93-91768-30-0)

CHAPTER
12

BASICS OF GENETIC ENGINEERING AND ITS APPLICATIONS IN RECENT ERA

S. D. Dawada

Indira Gandhi Kala Mahavidyalaya, Ralegaon

Genetic engineering:

It is the direct manipulation of an organism's genome (total no. of gene) using biotechnology. Novel DNA is inserted in the host genome by isolating and copying the gene of interest using molecular cloning method to construct a DNA sequence, or synthesizing the DNA and then inserting this new DNA in to the host organism.

One of the basic principles of recombinant DNA technology involves the digestion of a vehicle. For example, with plasmids or viral DNA restricting enzymes, which are molecular scissors that cut DNA at specific sites. DNA molecules from the juice organism are also digested in a separate tube with the same restriction enzyme. The two DNAs are then mixed together and joined together, this time using an enzyme called DNA ligase to form a single double-stranded DNA molecule. The vehicle containing the foreign DNA is then inserted into the recipient organism by transformation or transfusion. It is important to ensure that the vehicle has a replica origin, identified by the host's DNA synthesis machinery. After this the foreign DNA multiplies many times in the new host.

There are five essential elements to recombinant DNA technology:

1. Precise selection, cleavage and joining of DNA molecules obtained from different sources (donor DNA).
2. Attachment of recombinant DNA molecule to selected self-replicating gene vehicle (vector).
3. Transformation of a compound means recombinant DNA molecule into a host cell and selection.
4. Confirmation of cloned gene screening of the host by physical mapping and DNA sequencing.
5. Expression of a foreign gene in the host for the desired product.

Gene cloning Enzyme in r DNA technology:

1. DNA ligase:

- *E. coli* is the source of DNA ligase.
- Two fragments of DNA are joined by DNA ligase

Innovative Research Trends in Science and Humanities

Dr. Ninad S. Dharkar
Dr. Kishor P. Suradkar
Dr. Suruchi R. Kadu
Dr. Dasharath M. Chavhan
Dr. P. B. Ingle

As per Sant Gadge Baba Amravati University
Amravati Syllabus

A TEXT BOOK OF

ZOOLOGY

For B. Sc., Third Year, Semester - VI
(Molecular Biology and Biotechnology)

- AUTHORS -

Dr. Neeta S. Labhsetwar
M.Sc., Ph.D.
B. B. Arts, N. B. Commece and
B. P. Science College, Digras,
Dist. Yavatmal

Dr. Pravin M. Makode
M.Sc., Ph.D
Dr. R. G. Rathod Arts and
Science College Murtizapur,
Dist. Akola

Dr. Vaibhao G. Thakare
M.Sc. Ph.D. SET, INSPIRE Fellow (DST)
Government Vidarbha Institute of Science
and Humanities, Amravati,
Dist. Amravati

Dr. Sandeep M. Chede
M.Sc., Ph.D
Gopikabai Sitaram Gawande
Mahavidyalaya,
Umarkhed, Dist. Yavatmal

Dr. Narendra A. Manwar
M.Sc., Ph.D. NET (JRF), SET, GATE
Mahatma Phule Arts and Science College,
Patur, Dist. Akola

Dr. Sagar D. Dawada
M.Sc., Ph.D
Indira Gandhi Kala Mahavidyalaya,
Ralegaon, Dist. Akola

- EDITORS -

Dr. Rajeevkumar K. Gulhane
M.Sc., M.Phil, Ph.D
S. S. S. K. R. Innani Mahavidyayalaya,
Karanja Lad, Dist. Washim

Dr. P. H. Rohankar
M.Sc., Ph.D.
Government Vidarbha Institute of
Science and Humanities, Amravati
Dist. Amravati

Dr. Dinesh K. Dabhadkar
M.Sc., Ph.D. INSPIRE Fellow (DST)
Gopikabai Sitaram Gawande
Mahavidyalaya, Umarkhed,
Dist. Yavatmal

A Textbook of
B.Sc. Second year course in

ZOOLOGY

Cell Biology and Developmental Biology

Semester - III

- EDITORS -

Dr. Yashashree A. Gadhikar
M.Sc. Ph.D.
Professor
Department of Zoology
Govt. Vidarbha Institute of Science and Humanities (Autonomous), Amravati

Dr. Praveen P. Joshi
M.Sc. Ph.D.
Associate Professor & Head
Department of Zoology
Amolakchand Mahavidyalaya, Yavatmal

Dr. Pravin M. Makode
M.Sc., Ph.D., FIAES
Associate Professor & Head
Department of Zoology,
Shri. Dr. R. G. Rathod Arts & Science College, Murtizapur

- AUTHORS -

Dr. Jayashree V. Bhise
M.Sc. Ph.D.
Assistant Professor
Department of Zoology
Dr. Manorama and Prof. H.S. Pundkar Arts Commerce and Science College, Balapur

Dr. Sagar D. Dawada
M.Sc. Ph.D.
Assistant Professor
Department of Zoology
Indira Gandhi Kala Mahavidyalaya Ralegaon, Dist . Yavatmal

Dr. Dnyaneshwar M. Shimbre
M.Sc. Ph.D.
Assistant Professor
Department of Zoology
Shri Vankatesh Arts, Commerce and Science College, Deulgaon Raja

Dr. Shubhangi V. Gawande
M.Sc. Ph.D.
Assistant Professor
Department of Zoology
Shri. Shivaji Science College, Amravati

Dr. Rajendra B. Gade
M.Sc. Ph.D.
Assistant Professor
Department of Zoology
Shri Shivaji Science And Arts College , Chikhli, Dist. Buldana

Mr. Sachin D. Jadhav
M.Sc. NET
Assistant Professor
Department of Zoology
Shri Pundlik Maharaj Mahavidyalaya, Nandura Rly. Dist. Buldana

आपल्या हक्काचं व्यासपीठ

National Level Publication
I Central Govt. of India Approved Publication
I ISBN Approved Publication
I ISO 9001-2015 Certified Publication
I 25 Years Experience Holder Publication

नभप्रकाशन®
ISO 9001 : 2015

CERTIFICATE

This is to certify that a **A Text Book of Zoology**, B.Sc. Part-II Semester- IV, First Edition : January 2024; **ISBN No. .978-93-93940-38-4** has been written by following teaching faculties.

Dr. Mrs. R. P. Tekade
Assistant professor
Late RB Arts Comm and Smt SR Bharti science College, Arni Yavatmal.

Dr. Seema Virbhan Keswani
Assistant professor and Head of Department
M.S.P. Arts, Science and K.P.T. Commerce College, Manora.Dist.Washim

Dr. Pratibha S. Mahalle
Assistant professor and Head of Department
Vinayak Vidnyan Mahavidyalaya, Nandgaon Khandeshwar, Dist.Amravati

Miss. Snehal G. Rodge
Assistant professor
Shri Shivaji Art, Commerce And Science College, Akot, Dist. Akola

Miss. Snehal G. Rodge
Assistant professor
Shri Shivaji Art, Commerce And Science College, Akot, Dist. Akola

Ms. Bhagyashri K. Lohakar
Assistant professor
Indria Gandhi Kala Mahavidyalaya, Ralegaon, Dist. Yeotmal

Mr. Anil N. Khade
Assistant professor
Shri Vitthal Rukhmini Mahavidyalaya, Sawana, Dist. Yeotmal

This Book has been Edited by- **Dr. Pankaj W. Chaudhari,** Assistant Professor and Head of Department, Shri Vitthal Rukhmini Mahavidyalaya, Sawana, Tq. Mahagaon Dist. Yavatmal., **Dr. Sudhir G. Chirde** ,Assistant Professor, Art, Commerce and Science College, Maregaon, District Yavatmal. **Dr. Nandkishor E. Warghat,** Assistant Professor,Arts and Science College,Pulgaon, Dist. Wardha.

Date : 20 January 2024
Place : Amravati

(Ravindra B. Dahake)
Nabh Prakashan

Bhoomiputra Colony, Near Congress Nagar,
Amravati - 444 606 (Maharashtra)
Mob. 9765748457, 7798204500
nabhprakashan@gmial.com
www.nabhprakashan.com

A LEADING BOOKS PUBLISHING HOUSE IN INDIA

As per the new syllabus prescribed by
University Grant Commission New Delhi

ENVIRONMENTAL STUDIES

Useful for all under graduate Programmes

AUTHORS

Dr. Ninad S. Dharkar
Dr. Kishor P. Suradkar
Dr. Suruchi R. Kadu
Dr. Dasharath M. Chavhan
Dr. P. B. Ingle
Mr. Vivek D. Samarth
Mr. Gokul S. Bajaj

EDITORS

Dr. Suruchi R. Kadu
Dr. Kishor P. Suradkar

ENVIRONMENTAL STUDIES

Published by the **DnyanPath Publication (INDIA)**
The edition published in 5 October, 2021

ISBN 13 : 978-93-91331-71-9

DnyanPath® Publication
ISO 9001 : 2015

Visit us
www.dnyanpath.org

Reg. Office	:	FFS-A, Block C, First Floor, Venus Plaza, Shegaon Naka, V.M.V. Road, Amravati - 444 603 (Maharashtra)
Our Distribution	:	Maharashtra, Delhi, Gujrat, Chattisgarh, Telangana, Bihar.
Visit us	:	www.dnyanpath.org
Contact us	:	dnyanpathpub@gmail.com
Phone	:	08600353712, 09503237806

Printed at Shri Gurudeo Printers, Amravati.
Mahatma Fule Sankul, Shegaon Naka,
V.M.V. Road, Amravati - 444603 (Maharashtra)

Price : ₹ 300/-

ENVIRONMENTAL STUDIES

Useful for all under graduate Programmes

- AUTHORS -

Dr. Ninad S. Dharkar
M.Sc., Ph.D., F.B.F.I., F.I.S.C.A.
Assistant Professor in Botany
S.P.M. Science College & Gilani
Arts Commerce College
Ghatanji Dist. Yavatmal (MS) India.

Dr. Kishor P. Suradkar
M.Sc., NET, Ph.D. (Botany)
Assistant Professor and Head
Department of Botany
Indira Mahavidyalaya, Kalamb
Dist. Yavatmal (MS) India.

Dr. Suruchi R. Kadu
M.Sc., Ph.D. (Botany)
Assistant Professor in Botany
Brijlal Biyani Science College
Amravati (MS) India.

Dr. Dasharath M. Chavhan
M.Sc., NET-JRF, Ph.D., (Chemistry)
Assistant Professor in Chemistry
Indira Mahavidyalaya, Kalamb
Dist.Yavatmal (MS) India.

Dr. P. B. Ingle
M.A., SET, Ph.D. (Psychology)
Assistant Professor in Psychology
Indira Mahavidyalaya, Kalamb
Dist.Yavatmal (MS) India.

Mr. Vivek D. Samarth
SET, NET, GATE
M.Sc. (Botany, Biotechnology)
Assistant Professor and Head Dept. of Botany
Indira Gandhi Kala Mahavidyalaya,
Ralegaon, Dist. Yavatmal

Mr. Gokul S. Bajaj
M.Sc (Biotechnology, Botany-Gold Medalist),
CSIR UGC NET LS (AIR-42), ICAR ASRB
Assistant Professor
Department of Botany and Head
Department of Biotechnology,
Brijlal Biyani Science College, Amravati

- EDITORS -

Dr. Suruchi R. Kadu
M.Sc., Ph.D. (Botany)
Assistant Professor in Botany
Brijlal Biyani Science College
Amravati (MS) India.

Dr. Kishor P. Suradkar
M.Sc., NET, Ph.D. (Botany)
Assistant Professor and Head
Department of Botany
Indira Mahavidyalaya, Kalamb
Dist. Yavatmal (MS) India.

As Per Sant Gadge Baba Amravati University
New Syllabus (under CBCS)

A Textbook of
B.Sc. Second year course in

BOTANY

Angiosperm Systematics, Anatomy, Embryology

Semester - III

Authors

Dr. P. Y. Anasane
Mr. M. V. Wankhade
Dr. A. V. Rajurkar
Mr. S. S. Gawali
Dr. M. B. Bobade

Editors

Dr. P. Y. Anasane
Dr. S. S. Rokade
Miss. J. P. Morey

DNYANPATH PUBLICATION

A Textbook of
B.Sc. Second year course in

BOTANY

Angiosperm Systematics, Anatomy, Embryology

Semester - III

Published by **DnyanPath Publication, Amravati (INDIA)**
The First edition published in August, 2023

ISBN : 978-81-19435-95-1

DnyanPath® Publication
ISO 9001 : 2015

Visit us
www.dnyanpath.org

Reg. Office	:	FFS-A, Block C, First Floor, Venus Plaza, Shegaon Naka, V.M.V. Road, Amravati, Maharashtra 444 603
Branch Office	:	Kalash Complex, Near Gulmohar Hall, Pande Layout, New Sneh Nagar, khamala, Nagpur, Maharashtra 440025
Visit us	:	www.dnyanpath.com
Contact us	:	dnyanpathpub@gmail.com
Phone	:	08600353712, 09503237806

Printed at - Shri Gurudeo Printers, Amravati.
Mahatma Fule Sankul, Shegaon Naka,
V.M.V. Road, Amravati - 444603 (Maharashtra)

₹ : 200/-

As Per Sant Gadge Baba Amravati University
New Syllabus (under CBCS)

A Textbook of
B.Sc. Second year course in

BOTANY

Angiosperm Systematics, Anatomy, Embryology

Semester - III

- AUTHORS -

Dr. P. Y. Anasane
Professor
G. S. Gawande Mahavidyalaya,
Umarkhed

Mr. M. V. Wankhade
Assistant Professor
Indira Gandhi Kala Mahavidyalaya,
Ralegoon

Dr. A. V. Rajurkar
Assistant Professor
Lokmanya Tilak Mahavidyalaya Wani.
Dist.Yavatmal

Mr. S. S. Gawali
Assistant Professor
Smt Sindhutai Jadhao Art's and Science
Mahavidyalay Mehkar.

Dr. M. B. Bobade
Associate Professor
Mahatma Fule Arts,Comm & S.C.Science
Mahavidyalay, Warud.

- EDITORS -

Dr. P. Y. Anasane
Professor
G. S. Gawande Mahavidyalaya,
Umarkhed

Dr. S. S. Rokade
Assistant Professor
Late Pundlikrao Gawali Arts &
Science Mahavidyalaya, Shirpur (Jain)

Miss. J. P. Morey
Assistant Professor
S.P.M. Science & Gilanai Arts, CommerceCollege,
Ghatanji, Dist: Yavatmal

International Journal for Multidisciplinary Research
International Conference on Multidisciplinary Research & Studies 2023
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Ethnobotanical and Phytochemical Study of members of Cucurbitaceae from Ralegaon Region-A Review

Deshmukh N.M.[1*] Samarth V.D.[1], Kumre R.N.[2]

[1]Department of Botany, Indira Gandhi Kala Mahavidyalaya, Ralegaon Dist: Yavatmal
[2]Department of Chemistry, Indira Gandhi Kala Mahavidyalaya, Ralegaon Dist: Yavatmal

Abstract:

The plant species belonging to Cucurbitaceae family have a worldwide distribution, but most species can be found in tropical and subtropical countries. A number of the plants belonging to this family have reported important and biological pharmacological activities. Cucurbitaceae member plants are also in use in the folk medicinal system of India. The members of the Cucurbitaceae are annual or perennial herbaceous plants having climbing habit with characteristic tendrils. Plants of this family have many medicinal and nutritional benefits. Therefore, it is important to find out the Ethnobotanical uses in rural region of Ralegaon area and containing active agents possessing pharmacological activity in plants. In this study, we have documented some of the important plants viz., *Citrullus lanatus, Lagenaria siceraria, Bryonia lacinosa, Cucumis sativa, Coccinia grandis, Cucurbita pepo, Momordica dioica, Momordica charantia, Cucumis callosus, and Luffa acutangular* located in Ralegaon region.

Keywords: Cucurbitaceae, Medicinal, Ralegaon region.

Introduction

Ralegaon is tehsil place, town in Yavatmal District of Maharashtra. It includes 146 villages, covered 762 km² areas. Most of the area of ralegaon taluka is covered by forest. A number of villages are situated at edge of the forest. So, the population is mainly rural and agriculture and agricultural labor are the major occupations of the rural people. [2] They use folk medicinal practices for the treatment of many diseases and illness which is found around us. Plants were used as remedies to cure many diseases and infections during ancient time. Medicinal plants are easily available, cheap and affordable. The plants have medicinal importance due to the presence of certain chemical substances that produce specific physiological actions on the human body. The most essential of these bioactive constituents of plants are alkaloids, tannins, saponins, flavonoids and phenolic compounds. [1] The gourd family, Cucurbitaceae is one of the most important family, which includes approximately 125 genera and 960 species. [3] The family Cucurbitaceae includes a large group of cultivating crops like cucumbers, watermelon, luffa, etc. and medicinally important plants like bottle gourd (Lavki), bitter gourd (Karela) etc. which are medicinally important. The present study is to review the pharmacologically and biologically important plants and phytochemicals present in cucurbits and to understand their pharmacological activity

Material & Method

A Systematic survey of the 10 species of family Cucurbitaceae growing throughout the Ralegaon region was carried out. To find out the traditional medicinal uses of this plants visited the tribals, rural population, and vaidus in the Ralegaon region. The information was collected from them about the plants of cucurbitaceae member used to treat diseases. Also phytochemical constituent's information was collected of those plants used for disease treatment. A literature review was conducted to study the phytochemistry & acknowledged.

Result and Discussion

Ethnobotanical investigation and survey has led to the documentation of family cucurbitaceae plants used by tribals, rural people and vaidus for treatment of diseases like fever, infertility, heatstroke, worm infection etc. They gave information about their traditional medicinal applications in curing treatment of

various diseases. Out of 10 species, 10 were used medicinally, 9 were edible, for humans. The results of the present study are discussed below.

Sr. No	Scientific Name of Plant	Common Name	Phytochemicals	Pharmaceutical and Biological activities
1	*Bryonia lacinosa* L.	Marble,Vine, Shivalingi, Shivaling	saponin molecules, flavonoids, phenolic acids, sugars, punicic acid, goniothalamin and gluccomannan. The polysaccharides and fatty acids.[4]	Antimicrobial, antibacterial, analgesic, Anti-inflammatory, androgenic, antipyretic, antidiabetic, anti-asthmatic, anti-oxidant, anti-tumor[4]
2	*Citrullus lanatus* (Thunb.) Mat. & Nak.	Watermelo, Kharbuza, Tarabuuza, Tarabuuja.	alkaloids, flavanoids, tannins, amino acids, carbohydrates, cardioglycosides, terpenoids, steroids, carotenoids, oils and fats, vitamins, Calcium, Iron, Magnesium, Phosphorus, Potassium, and Zinc.[10]	Antibacterial, antifungal, antimicrobial, antiulcer, antioxidant, anti-inflammatory, anti-hyperglycemic, anti-cancer, anti-diabetic, anti-hepatotoxic, anti-inflammatory, anti-helminthics, anti-virus, anti-bacterial, anti-microbial [10]
3	*Coccinia grandis* (L.) Voigt	Ivy Gourd, Kundru, Tondli	Steroid, carbohydrates, tannins, flavonoids, saponins, alkaloids b-amyrine, lupeol, cucubbitacin, cephalandrol, cephalandrine.[15]	Antibacterial, Anthelmintic, Antioxidant, antiulcer, antimalarial, anti-inflammatory, antipyretic, analgesic, hypoglycaemic, antifungal, Anti-dyslipidemic, Antitussive, anticancer, antitussive, mutagenic activity.[14]
4	*Cucumis callosus* (Rottler) Cogn.	Muskmelon, Sweetmelon	alkaloids, carbohydrates, proteins/amino acids, glycosides, fixed oils & fats, phenolics, tannins, phytosterols, flavonoids, Saponins.[21]	antioxidant, anti-inflammatory, antidiabetic. [22]
5	*Cucumis sativus* L.	Cucumber, garden cucumber, apple cucumber, Khira, Kakadi,	Flavonoids, alkaloids, glycosides, saponins, tannins, terpenoids, carbohydrates, and sterols.[12]	anti-bacterial activity, antifungal activity, cytotoxic activity, Antacid & Carminative activity, Activity against ulcerative colitis, Hepetoprotective activity, Hypoglycemic and. Hypolipidemic activity.[13]
6	*Cucurbita pepo* L.	Pumpkin, Field pumpkin, kaddu, Kohala, Bhopla	Steroid, Protein, steroids, tannins, flavonoids, triterpenoids, phenols.[16]	Antitumor activities, Antimicrobial, Antioxidant, Hypoglycemic and hypolipidemic.[17]
7	*Lagenaria*	Bottle Gourd,	Flavonoids, Protein,	Analgesic and anti-inflammatory,

	siceraria (Mol.) Standl.	Bitter calbash gourd, Lauki, Dudhi	Triterpenes, Volatile essential oil, Carbohydrates.[11]	Diuretic activity, Anthelmintic activity, Antihepatotoxic activity, Immunomodulatory activity, Antistress and adaptogenic property, Antimicrobia, Antioxidant. [11]
8	*Luffa acutangular* (L.) Roxb.	Wild luffa, Ban turai, kadu-dodaki	Proteins, Flavonoids, Anthraquinone, Fatty Acids, Saponin Triterpene.[20]	hepatoprotective, antidiabetic, antihyperlipidemic, antioxidant, anticancer, antibacterial, CNS depressant, immunomodulatory, and anti-ulcer activity. [20]
9	*Momordica charantia* L.	Bitter Gourd, Karela, karali,	Saponins, proteins, polypeptide, steroid, pyrimidine nucleoside.[19]	Anti-cancer, Antivirals, Analgesic Effects, Anti-inflammatory, Hypotensive action, Anti-fertility effects.[19]
10	*Momordica dioica* Roxb. ex Willd	Ban Karela, Kartoli	Protein, lipid, fibre, carbohydrate, potassium, sodium, calcium, iron, zinc, fat, vitamins, alkaloids, steroids, triterpenoids, and saponins, flavonoids[18]	diuretic, laxative, hepatoprotective, antivenomous, anti-hypertensive, anti-inflammatory, anti-asthmatic, antipyretic, anti-leprosy, antidiabetic, and antidepressant properties but also its leaves have anti-helminthic, aphrodisiac, anti-hemorrhoidal, hepatoprotective, anti-bronchitic, antipyretic, anti-asthmatic, and analgesic properties.[18]

Conclusion

In the present study, we reviewed phytochemical constituents, pharmacological properties and medicinal uses of certain plant species of Cucurbitaceae in Ralegaon region. Different parts of the plants such as stem leaf, root, tuber, fruit and seed of the above members of this family have been studied extensively by many researchers. The ethnobotanical and phytochemical review undertaken in this plant family displayed multidisciplinary usage of these plants in curing of various types of diseases. Considering its huge phytochemical and variety of pharmacological activities, the Cucurbitaceae members could be proposed as good candidates for discovering new drugs as well as agriculture-based entrepreneurship.

Acknowledgement

The authors wish to thank the tribals, rural peoples, vaidus of villages in Ralegaon region. who wholeheartedly cooperated by sharing their traditional medicinal knowledge with us.

References

1. Rajasree R. S., Sibi P. I., Femi Francis, Helen William, “Phytochemicals of Cucurbitaceae Family – A Review” International Journal of Pharmacognosy and Phytochemical Research, 2016, 8(1), 113-123.
2. Rahmatullah M., Biswas A., Haq W.M., Seraj S., Jahan R., “Use of cucurbitaceae family plants in folk medicinal system of Bangladesh” Chronicles of Young Scientists, 2012, Vol.3 (3), 212-222.
3. Jeffrey C. “A new system of Cucurbitaceae” Botanicheskii Zhurnal, 2005, 90, 332-335.
4. Kaurav H., Choudhary S., Chaudhary G., “An Ayurvedic Herbal Plant ‘Bryonia laciniosa’ with its Ethnomedicinal Significance”, Journal of Drug Delivery & Therapeutics, 2021,11(3-s), 137-141.
5. Jamuna S., Karthika K. and Paulsamy S., “Phytochemical and pharmacological properties of certain medicinally important species of Cucurbitaceae family – a review” Journal of Research in Biology, 2015, 5(6), 1835-1849.
6. Avinash T. S. and Rai V. R. “An ethanobotanical investigation of cucurbitaceae from South India: A review” Journal of Medicinal Plants Studies, 2017, 5(3), 250-254.

7. Rahman A H M M, "Systematic studies on Cucurbitaceae family at Rajshahi division, Bangladesh" Plant. Vol. 1, No. 2, 2013, 10-15.
8. Sri Rama Murthy K., Ravindranath D., Sandhya Rani S., Pullaiah T., "Ethnobotany and distribution of wild and cultivated genetic resources of Cucurbitaceae in the Eastern Ghats of Peninsular India" Topclass Journal of Herbal Medicine, June, 2013, Vol. 2(6),149-158.
9. Tupe S.B., Patil P.D., Thoke R.B. and Aparadh V.T., "Phytochemical Screeing in some Cucurbitaceae members" International Research Journal of Pharmaceutical and Applied Sciences" 2013, 3(1), 49-51.
10. Deshmukh C.D., Jain A., Tambe M.S., "Phytochemical and Pharmacological profile of Citrullus lanatus (THUNB)", Biolife, 2015, 3(2), 483-488.
11. Prajapati R.P., Kalariya M., Parmar S.P., Sheth N.R., "Phytochemical and pharmacological review of Lagenaria sicereria", Journal of Ayurveda & Integrative Medicine, 2010, 266-272.
12. Mandey J.S., Wolayan F.R., Pontoh C.J., Sondakh B.F.J., "Phytochemical Characterization of Cucumber (Cucumis sativus L.) Seeds as Candidate of Water Additive for Organic Broiler Chickens", Journal of Advanced Agricultural Technologies, Vol. 6. 2019, 61-64.
13. Sahu T., Sahu J., "Cucumis Sativus (Cucumber): A Review on Its Pharmacological Activity", Journal of Applied Pharmaceutical Research, Vol.3. 2015, 4-9.
14. Pekamwar S. S., Kalyankar T.M., Kokate S.S., "Pharmacological Activities of Coccinia Grandis: Review", Journal of Applied Pharmaceutical Science, Vol. 3 (5), 2013, 114-119.
15. Hossain S.A. Uddin S.N., Salim M.A., Haque R., "Phytochemical and Pharmacological screening of Coccinia grandis Linn", Journal of Scientific and Innovative Research, 2014, 3(1), 65-71.
16. Srividhya V., Thangavel S., Satheeskumar G.K., Kanupriya J., Sivakumar A.G., "Antioxidant potential and Phytochemical analysis of fruit extract of Cucurbita pepo", International Journal Curr. Res. Chem. Pharm. Sci, 2019, 6(3), 22-32.
17. Adnan M., Gul S., Batool S., Fatima B., Rehman A., Yaqoob S., Shabir H., Yousaf T., Mussarat S., Ali N., Khan S.N., Rahman H., Aziz M.A., "A review on the ethnobotany, phytochemistry, pharmacology and nutritional composition of Cucurbita pepo L.", The Journal of Phytopharmacology, 2017, 6(2), 133-139.
18. Talukdar S.N., Hossain M.N., "Phytochemical, Phytotherapeutical and Pharmacological Study of Momordica dioica", Evidence-Based Complementary and Alternative Medicine, 2014, 1-11.
19. Raman A., Lau C., "Anti-Diabetic Properties and Phytochemistry Momordica charantia L. (Cucurbitaceae)", Phytomedicine, Vol. 2, 1996, 349-362.
20. Shendge P.N., Belemkar S., "Therapeutic Potential of *Luffa acutangula*: A Review on Its Traditional Uses, Phytochemistry, Pharmacology and Toxicological Aspects",Frontiers in Pharmacology, Vol.9, 2018, 1- 14.
21. Chand T., Bhandari A., Kumawat B., Sharma A., Bansal V., Pareek P., "Research Journal of Pharmaceutical, Biological and Chemical Sciences" April 2012, Vol. 3, (2), 570-576.
22. Panda S.P., Reddy R. A., Panigrahy U. P., "Asian Journal of Pharmaceutical and Clinical Research" 2018, Vol 11, (10), 438-442.
23. https://www.itfnet.org/v1/2016/05/watermelon-name-taxonomy-botany/
24. https://www.efloraofgandhinagar.in/climbers/luffa-cylindrica
25. http://www.flowersofindia.net/catalog/slides/Bottle%20Gourd.html
26. https://climbers.lsa.umich.edu/?p=252
27. http://theworldwidevegetables.weebly.com/cucumis-sativus-cucumber.html

आपल्या हक्काचं व्यासपीठ

National Level Publication
I Central Govt. of India Approved Publication
I ISBN Approved Publication
I ISO 9001-2015 Certified Publication
I 25 Years Experience Holder Publication

नभप्रकाशन®
ISO 9001 : 2015

CERTIFICATE

This is to certify that a **A Text Book of Zoology,** B.Sc. Part-II Semester- III, **Cell Biology and Development Biolog, y** First Edition : July 2023; **ISBN No. 978-93-93940-21-6** has been written by following teaching faculties.

Dr. Pankaj W. Chaudhari
Assistant Professor and Head of Department
Shri Vitthal Rukhmini Mahavidyalaya, Sawana, Tq.Mahagaon Dist. Yavatmal.

Dr. Sudhir G. Chirde
Assistant Professor
Art, Commerce and Science College, Maregaon, District Yavatmal.

Mr. Pranit D. Thakare
Department of Zoology,
S.P.M Science and Gilani Arts, Commerce College, Ghatanji Dist. Yavatmal

Prof. Ankush C. Ade
Assistant Professor, Department of Zoology,
Indira Gandhi Kala Mahavidyalaya, Ralegaon,Tq.Ralrgaon Dist.Yavatmal

Dr. Chhaya A. Khillare
Assistant Professor
Late Pushpadevi Patil Arts and Science College Risod Dist. Washim

Dr. Nilima M. Kankale
Assistant Professor
Ghulam Nabi Azad Arts, Commerce and Science College, Barshitakli, Dist. Akola

This Book has been Edited by- **Dr. Pankaj W. Chaudhari,** Assistant Professor and Head of Department Shri Vitthal Rukhmini Mahavidyalaya, Sawana, Tq.Mahagaon Dist. Yavatmal. **Dr. Sudhir G. Chirde** ,Assistant Professor, Art, Commerce and Science College, Maregaon, District Yavatmal. **Dr. Nandkishor E. Warghat,** Assistant Professor, Arts and Science College, Pulgaon, Dist. Wardha.

Date : 25 July 2023
Place : Amravati

(Ravindra B. Dahake)
Nabh Prakashan

Bhoomiputra Colony, Near Congress Nagar,
Amravati - 444 606 (Maharashtra)
Mob. 9765748457, 7798204500
nabhprakashan@gmial.com
www.nabhprakashan.com

A LEADING BOOKS PUBLISHING HOUSE IN INDIA