

Research Publications in the Journals

Link to article / paper / abstract of the article

Session: 2021-22

S.N.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Calendar Year of publication	ISSN number	Link to article / paper / abstract of the article
1	स्वयं मदत व उन्नतीचा मार्ग सहकार	J.D. POREY	COMMERCE	Recent Trends in commerce, Economic and Management	2021-22	ISBN : 978-92425-78-3	https://drive.google.com/file/d/1HA91FBCjSiEa9c4buFFY0w-JqLxePqaX/view?usp=share_link
2	Cyber Security Analysis of Internet Banking in Emerging countries	J.D. POREY	COMMERCE	B Aadhar	2021-22	ISSN 2278-9308	https://drive.google.com/file/d/1n5iktMA0s8zB4TbZVC-mllCmPJA_Mes7/view?usp=sharing
3	Impact of Covid-19 on working in unorganized sector with special reference to Melghat region District Amravati	Dr. V. R. Gawhale	COMMERCE	Interling Research Analysis	2021-22	ISSN No. 0976-0377	https://tinyurl.com/2p96beyd
4	A study on Bitcoin in Akola City	Dr. D. N. Vyas	COMMERCE	B. Aadhar- Peer Reviewed and Refereed Indexed Multidisciplinary International Research Journal	2021-22	ISSN NO. 2278-9308	https://drive.google.com/file/d/1pxro0CV-4xQ2OkSSIDbfJDtU14HUw5ge/view?usp=sharing
5	New Education Policy: An Overview of Higher Education	Dr. D.N. Vyas	COMMERCE	B.Aadhar Peer Reviewed and Refereed Indexed Multidisciplinary International Research Journal	2021-22	ISSN No 2278-9308	https://drive.google.com/file/d/1bN9z1hPCv371y8kiUJOoIeqBFbeXuY6u/view?usp=sharing
6	Cyber Security Analysis Of Internet Banking In Emerging Countries Page No. 62-65 February, 2022	Dr. M. S. Gaikwad	COMMERCE	B. Aadhar' International Peer-Reviewed Indexed Research Journal	2021-22	ISSN-2278-9308	https://tinyurl.com/bdhpvv72
7	Buying behavior of students towards toothpaste: A study on western Vidarbha Page No. 30-34 February, 2022	Dr. M. S. Gaikwad	COMMERCE	B. Aadhar' International Peer-Reviewed Indexed Research Journal	2021-22	ISSN-2278-9308	https://tinyurl.com/ydr6hzy7
8	A study of brand preference towards toothpaste of college students in western vidarbha Page No. 6-12 April – June 2022	Dr. M. S. Gaikwad	COMMERCE	Ajanta International research journal	2021-22	ISSN 2277-5730	https://tinyurl.com/mr3ykate

9	Review Study on Digital Currency	Dr. D. N. Vyas	COMMERCE	Ajanta -An International Multidisciplinary Quarterly Research Journal	2021-22	ISSN No2277-5730	https://drive.google.com/file/d/1ccYG9LEer6-bBbyMRZolmAvFuWkM5YTI/view?usp=sharing
10	Recognition of Devanagari Numerals using Jordan-Elman Network for CAPTCHA Design	Dr. P. S. Bodkhe & Dr. P E Ajmire	Computer Science	Scopus (Design Engineering) Journal	2021-22	ISSN 0011-9342	https://scholar.google.co.in/citations?view_op=view_citation&hl=en&user=Z3X6dOEAAAAJ&citation_for_view=Z3X6dOEAAAAJ:eQOLeE2rZwMC
11	Recognition of Devanagari Numerals using Jordan-Elman Network for CAPTCHA Design	Dr. P. E. Ajmire	Computer Science	Scopus (Design Engineering) Journal	2021-22	ISSN 0011-9342	https://scholar.google.co.in/citations?view_op=view_citation&hl=en&user=Z3X6dOEAAAAJ&citation_for_view=Z3X6dOEAAAAJ:eQOLeE2rZwMC
12	RECOGNITION OF PRINTED DEVNAGARI CHARACTERS USING A SET OF OPTIMALLY DESIGNED MOMENT FEATURES WITH COMBINATION OF DCT, HAHN AND TCHEBICHEF	Dr. A. A.Tayade	Computer Science	Vidyabharati International Interdisciplinary Research Journal 12(2)	2021-22	ISSN : 2319-4979	https://www.viirj.org/vol12issue2/86.pdf
13	PRIORITIZATION OF DARK CHANNELS IN IMAGE DENOISING AND DEHAZING ALGORITHMS, March 2022.	Dr. A. A.Tayade	Computer Science	Vidyabharati International Interdisciplinary Research Journal 12(2)	2021-22	ISSN : 2319-4979	https://drive.google.com/file/d/11K793W0IR9VZw0nq834VlvtnLZCIIQzu/view?usp=sharing
14	Impacts of COVID-19 on the Information Technology (IT)	Dr. A. A.Tayade	Computer Science	B.Aadhar' International Peer-Reviewed Indexed Research Journal	2021-22	ISSN : 2278-9308	https://scholar.google.co.in/citations?view_op=view_citation&hl=en&user=BsvBk44AAAAJ&citation_for_view=BsvBk44AAAAJ:UcHWp8X0CEIC
15	Handwritten Recognition of Rajasthani Characters by Classifier SVM DOI: 10.1109/ICITIIT51526.2021.9399590	Dr. P. E. Ajmire	Computer Science	International Conference on Innovative Trends in Information Technology (ICITIIT)	2021-22	ISBN:978-1-6654-0467-9	https://doi.org/10.1109/ICITIIT51526.2021.9399590
16	An overview of information extraction methods, techniques and tools for the contents in chemical document	Dr. P. E. Ajmire	Computer Science	International Journal of Life Sciences	2021-22	ISSN:2320-7817	https://scholar.google.co.in/citations?view_op=view_citation&hl=en&user=FsJr5sAAAAJ&star_t=20&pagesize=80&citation_for_view=FsJr5s

							AAAAJ:JV2RwH3_ST0C
17	Dr Babasaheb Ambedkar- stri sakshamikaran aani baudh dharm	R.R.GAWHA LE	Economics	Hi-TECH Research Analysis	2021-22	ISSN 2231-6671 Impact factor 6.20	https://tinyurl.com/ydr6hzy7
18	Dr. Babasaheb Ambedkar yanche arthik vichar-ek adhyayan	R.R.GAWHA LE	Economics	Universal research analysis	2021-22	ISSN 2229-4406 Impact factor 6.10	https://tinyurl.com/ydr6hzy7
19	Dr. Babasaheb Ambedkar yanche arthik vichar- ek adhyayan	R.R.GAWHA LE	Economics	B. Aadhar- Peer Reviewed and Refereed Indexed Multidisciplinary International Research Journal	2021-22	ISSN 2278-9308 Impact factor 7.675.	https://tinyurl.com/ydr6hzy7
20	A study on the identification and analysis of different macronutrients of the soil through advanced techniques.	J S Tated	ELECTRONICS	Vidyabharati International Interdisciplinary Research Journal	2021-22	2319-4979	https://www.viirj.org/vol12issue2/57.pdf
21	Influence of atmospheric conditions on soil properties in vidarbha region: an IoT based remote monitoring system.	J S Tated	ELECTRONICS	International Journal of Creative Research Thoughts (IJCRT).	2021-22	2320-2882	https://www.ijcrt.org/papers/IJCRTL020038.pdf
22	An IoT Enabled Colorimetric Technique Based Soil Fertility Detection System.	J S Tated	ELECTRONICS	Aayushi International Interdisciplinary Research Journal	2021-22	2349-638X	https://drive.google.com/file/d/1vtKpdlI389eiDCPjU24jx00RPArzJ3HX/view?usp=sharing
23	INDIAN SENSIBILITY IN NISSIM EZEKIEL'S POETRY	Dr. D. T. Adhau	English	SCHOLARS IMPACT	2021-22	ISSN-2394-7632	https://drive.google.com/file/d/19xEbflNI5oeRqLnzQdV1mTnVhlfkp5YT/view?usp=sharing
24	राजी सेठ कि कहाणीया	Dr. S. N. Khadse	Hindi	B.Aadhar' International Peer-Reviewed Indexed Research Journal	2021-22	ISSN - 2278-9308	https://drive.google.com/file/d/1_gYtS2sY20PwHbdGfcHmk0nHJ3siGPE/view?usp=sharing
25	दलित साहित्य और सामाजिक चेतना कि अवधारणा	Dr. S. N. Khadse	Hindi	B.Aadhar' International Peer-Reviewed Indexed Research Journal	2021-22	ISSN - 2278-9308	https://drive.google.com/file/d/13yrD4ez9jWTZkp5uTzyLIMv_BMRHrB6j/view?usp=sharing
26	समकालीन हिंदी कहाणीया मे दलित विमर्श	Dr. S. N. Khadse	Hindi	B.Aadhar' International Peer-Reviewed Indexed Research Journal	2021-22	ISSN - 2278-9308	https://drive.google.com/file/d/1_gYtS2sY20PwHbdGfcHmk0nHJ3siGPE/view?usp=sharing

27	वामनदादा कर्डक यांच्या कवितेतील सामाजिकता आणि निसर्ग प्रतिमा	V.M.More	Marathi	Tifan	2021-22	2231-573X	https://drive.google.com/file/d/1e3khgspU-RT6nOxkDsbKM4fvbCSIAxfz/view?usp=sharing
28	जागतिकीकरण आणि ग्रामीण कवितेतील जाणीवांचे संदर्भ	V.U.More	Marathi	B.Aadhar	2021-22	2278-9308	https://drive.google.com/file/d/17ADcxCT8pv9ovDgZA4715-YSBHvtXsIM/view?usp=sharing
29	संविधानातील मूल्य व्यवस्था आणि समकालीन समाज वास्तव	V.U.More	Marathi	Research Nebula	2021-22	2277-8071	https://drive.google.com/file/d/1viHUYCbOfqOJWRdgiGPvIm95r36W0OI/view?usp=sharing
30	इ.स. 2000 नंतरची समस्याप्रधान कादंबरी पाडा	V.U.More	Marathi	Genius	2021-22	2279-0489	https://drive.google.com/file/d/1HkfBx4rwV0mbrFzsXixH32ACFUXWebuA/view?usp=sharing
31	Structural and spectral studies of Ce ³⁺ doped Sr ₃ Y(BO ₃) ₃ nano phosphors prepared by combustion synthesis	S P HARGUNANI	PHYSICS	Materials Technology - TAYLOR FRANCIS	2021-22	Print ISSN: 1066-7857 Online ISSN: 1753-5557	https://www.tandfonline.com/doi/full/10.1080/10667857.2020.1859052
32	Combustion synthesis of Ba ₃ Y _{1-x} Sm _{3+x} (BO ₃) ₃ as red-light emitting phosphors for indoor plant cultivation applications	S P HARGUNANI	PHYSICS	Journal of Physics: Conference Series	2021-22	Online ISSN: 1742-6596 Print ISSN: 1742-6588	https://iopscience.iop.org/article/10.1088/1742-6596/1913/1/012016/pdf
33	Wavelength down-conversion study of Ba ₃ Y _{1-x} (BO ₃) ₃ : x Tb ³⁺ & Eu ³⁺ [0.005 ≤ X ≤ 0.05] phosphor for solid state lighting applications	S P HARGUNANI	PHYSICS	Journal of Physics: Conference Series	2021-22	Online ISSN: 1742-6596 Print ISSN: 1742-6588	https://iopscience.iop.org/article/10.1088/1742-6596/1913/1/012021/pdf
34	Photo-Luminescence study of Ba ₃ Gd _{1-x} (BO ₃) ₃ : X Ce ³⁺ phosphor	S P HARGUNANI	PHYSICS	YMER // ISSN : 0044-0477	2021-22	ISSN : 0044-0477	http://ymerdigital.com/uploads/YMER221065.pdf
35	Structural and spectral studies of Ce ³⁺ doped Sr ₃ Y(BO ₃) ₃ nano phosphors prepared by combustion synthesis	R P SONEKAR	PHYSICS	Materials Technology - TAYLOR FRANCIS	2021-22	Print ISSN: 1066-7857 Online ISSN: 1753-5557	https://doi.org/10.1080/10667857.2020.1859052

36	Combustion synthesis of Ba ₃ Y _{1-x} Sm _{3+x} (BO ₃) ₃ as red-light emitting phosphors for indoor plant cultivation applications	R P SONEKAR	PHYSICS	Journal of Physics: Conference Series	2021-22	Online ISSN: 1742-6596 Print ISSN: 1742-6588	https://iopscience.iop.org/article/10.1088/1742-6596/1913/1/012016/meta
37	Wavelength down-conversion study of Ba ₃ Y _{1-X} (BO ₃) ₃ : x Tb ³⁺ & Eu ³⁺ [0.005 ≤ X ≤ 0.05] phosphor for solid state lighting applications	R P SONEKAR	PHYSICS	Journal of Physics: Conference Series	2021-22	Online ISSN: 1742-6596 Print ISSN: 1742-6588	https://iopscience.iop.org/article/10.1088/1742-6596/1913/1/012021/pdf
38	Photo-Luminescence study of Ba ₃ Gd _{1-x} (BO ₃) ₃ : X Ce ³⁺ phosphor	R P SONEKAR	PHYSICS	YMER // ISSN : 0044-0477	2021-22	ISSN : 0044-0477	http://ymerdigital.com/uploads/YMER221065.pdf
39	Jagtik Rajkarnat Bhartahe Sthan v Bhumika	Dr. P.A. Taori	Political Science	An International Multidisciplinary Research Journal: Ajanta Vol XI Issue 1 Jan-Mar 2022	2021-22	ISSN 2277-5730	https://drive.google.com/file/d/1R2Is80LYwp_CW5Op7gbRzd3xFLJpOkIZ/view?usp=sharing
40	Manavadhikarachyachya sandarbhat Dr. Abhay Bang yanche sarvajanic kshetratil yogadaan	Dr. P.A. Taori	Political Science	Aayushi international interdisciplinay Research Journal (AIIRJ)	2021-22	2349-638X	https://drive.google.com/file/d/1C402I9UvAgKxxuQvAJRbvg5vww6CpsX-Z/view?usp=sharing
41	Formulation of India State Hunger Index and Assessment of Associated factors	Dr. P.V.Ubale	Statistics	International Journal for research in Applied Science	2021-22	ISSN 2321-9653	https://doi.org/10.22214/ijraset.2021.36601
42	Identification of statistical weights for the components of Hunger Index	Dr. P.V.Ubale	Statistics	Frontiers in crop movements	2021-22	ISSN 2393-8234	https://www.asthafoundation.in/img/64-Arshi%20Khan.pdf
43	A study of Hunger situation in India through Formulation of India State Hunger Index using PCA	Dr. P.V.Ubale	Statistics	Progressive Research: An International Journal	2021-22	ISSN 2454-6003	https://www.asthafoundation.in/img/09-Arshi%20Khan.pdf
44	SIX SIGMA IN BANKING PROCESS: PAST, PRESENT AND FUTURE. PAST, PRESENT AND FUTURE.	Dr. V S Athawar	Statistics	INTERNATIONAL JOURNAL OF CURRENT SCIENCE - IJCSPUB (IJCSPUB.ORG)	2021-22	ISSN 22501770	https://drive.google.com/file/d/1_d0FqXhyNxOnqs1p2W-ceD6w9PpkPLGt/view?usp=sharing
45	“Urdu Ki Chand Ghair Muslim Shairaat Ki Sheri Khidmaat”	Dr. M. Raghob Deshmukh	Urdu	Quarterly Tahreek-E-Adab	2021-22	ISSN 2322-0341	https://www.tahreekeadab.com/
46	“Mirza Daag Dehlvi Shakhsiyat aur Fan”	Dr. M. Raghob Deshmukh	Urdu	Quarterly Tahreek-E-Adab	2021-22	ISSN 2322-0341	https://www.tahreekeadab.com/

47	“Vidarbha Mein Urdu Sheri aur chand kadim mashhur shoura”	Dr. M. Raghob Deshmukh	Urdu	Quarterly Tahreek-E-Adab	2021-22	ISSN 2322-0341	https://www.tahreekeadaab.com/
48	“Quami yakjahiti ke farouge mein urdu shairi ka hissa”	Dr. M. Raghob Deshmukh	Urdu	Monthly Qaumi Zaban	2021-22	ISSN 2321-4627	https://urduacademyts.com/eng/schemes/qaumi-zaban/
49	“Urdu Khaka Nigari Ka Agaz O Irtiqaa”	Dr. M. Raghob Deshmukh	Urdu	Quarterly Saghar E Adab	2021-22	ISSN 2582-3612	http://saghareadab.in/
50	Species Richness of Ants in Katol, Dist. Nagpur (M.S.).	Dr. G.B. Kale	Science (Zoology)	International Journal of Creative Research Thoughts Volume 9, Issue 1.	2021-22	ISSN: 2320-2882	https://www.ijcrt.org/papers/IJCRT2101586.pdf
51	Ichthyofaunal Diversity of Lanjud Reservoir Near Khamgaon in Buldana District	Dr. G.B. Kale	Science (Zoology)	International Journal of Creative Research Thoughts (IJCRT) Volume 10, Issue 1 pg.399-405	2021-22	ISSN: 2320-2882	https://www.ijcrt.org/papers/IJCRT2201272.pdf
52	Study Report of Road Side tree Cutting by Mahadiscom in Khamgaon Dist.Buldana (M.S.)	Dr. G.B. Kale	Science (Zoology)	Galaxy Link, International Multidisciplinary Half Yearly Research Journal ,Vol.-10-2,Oct.2022,pg.61-71.	2021-22	ISSN 2319-8508	https://drive.google.com/file/d/1sdMipnJSP7Q9jn_xmpOBaDEX0tCjZvNV/view?usp=sharing

“Recent Trends in Commerce, Economics and Management”

Edited Book

Shri. V. N. Arts and A. N. Commerce College

Mangrulpir, Dist. Washim



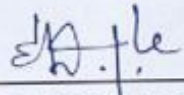
◀ Certificate of Publication ▶

This is certify that Dr./Mr./Mrs. प्रा. जयंत डी. चोरे.
of गो. से. महाविद्यालय, खामगांव has Contributed Chapter /
Research Article in “Recent Trends in Commerce, Economics and Management” published on
2 January, 2022 with ISBN No. 978-93-92425-78-3
He / She Contributed Book Chapter / Research Paper entitled _____

स्वयं मदत व उन्नतीचा मार्ग - सहकार


PRASHANT PUBLICATIONS
PUBLISHER




DR. LAXMAN K. KARANGALE
PRINCIPAL

Recent Trends

in Commerce, Economics
and Management



Dr. L. K. Karangale ▪ Dr. Varsha Sukhadeve
Dr. J. D. Porey ▪ Dr. R. R. Rathod ▪ Dr. N. B. Mathapati
Dr. Wasudeo D. Golait ▪ Mr. V. P. Hissal ▪ Dr. L. S. Hurne



RECENT TRENDS IN COMMERCE, ECONOMICS AND MANAGEMENT

- E d i t o r s -

Dr. L. K. Karangale

Principal
Shri V.N. Arts and A. N. Commerce
College, Mangrulpir, Dist.-Washim

Dr. J. D. Porey

Professor in Commerce
G.S. Science, Arts & Commerce
College, Khamgaon,
Dist.-Buldhana

Dr. N. B. Mathapati

Associate Professor in Economics
Shri V.N. Arts and A. N. Commerce
College, Mangrulpir Dist.-Washim

Mr. V. P. Hissal

Assistant Professor in Commerce
Shri V.N. Arts and A. N. Commerce
College, Mangrulpir, Dist.-Washim

Dr. Varsha Sukhadeve

Professor in Commerce
L.R.T. Commerce College
Akola, Dist.-Akola

Dr. R. R. Rathod

Professor & Vice - Pricipal
Ghulam Nabi Azad Arts, Commerce &
Science College Barshi-Takali,
Dist.-Akola

Dr. Wasudeo D. Golait

Associate Professor in Commerce
M.E.S. Arts and Commerce College,
Mehkar, Dist.:- Buldhana

Dr. L. S. Hurne

Assistant Professor in Commerce
Shri V.N. Arts and A. N. Commerce
College, Mangrulpir, Dist.-Washim



PRASHANT PUBLICATIONS

13.	Human Resource Accounting	99
	- B. Eswarniah	
14.	मेक इन इंडिया आणि उत्पादन क्षेत्र	108
	- जगेश्वर श्यामल जंभुळे	
15.	Integration of e-business with e-Life is the global need of time	114
	- Prof. Meena Donagre	
16.	Moving Towards Cashless Economy – Present Scenario in India	119
	- Dr. Nilesh N. Chotiya	
17.	Post Covid Opportunities and Challenges	124
	- Kanumuri Vinaya Kumar	
18.	Impact Of Agriculture Market On Indian Management System / Trends	130
	- Dhavale Sidhant Madhavrao	
19.	Recent Trends in Commerce, Economics and Management	136
	- Dr. Sachin Kadam	
20.	Recent Trends of Sustainable Development In Commerce and Management	142
	- Dr. Piyush U. Nalbe	
21.	Crypto Currency and Bit Coin	153
	- Mr. Sumit Rajendra Ginode	
22.	चस्तु एवं सेवा कर (जीएसटी) तथा भारतीय अर्थव्यवस्था	160
	- डॉ. चिंता राय, स्वर्णा मराठा	
23.	E-Marketing	169
	- Dr. Durga Anil Pande (Shukla)	
24.	Revolution of cashless economy in India	174
	- Dr. Sapna Ashish Nandeshwar	
25.	स्वयं मदत व उन्नीचा मार्ग-सहकार	180
	- प्रा. डॉ. जयंत डी. पोरे	
26.	Cashless Transactions And Modes of Digital Payment ...184	
	- Lahankar Sarika Madhukar	

27.	Impact of Good and Service Tax on Various Sectors in India	189
	- Dr. Smita Dnyaneshwer Jamdhade	
28.	Travel Industry in India	197
	- Ms. Disha Namdeo More	
29.	Recent Trends in Commerce, Economics and Management: Women and Leadership	204
	- Prof. Jaya Bhagat	
30.	Rural Startups and economic sustainability	209
	- Prof. Hanamanta Koli	
31.	Impact of Cashless Payment (on Economy Growth)	216
	- Dr. Ronil Kulbhushan Ahale	
32.	Make in India: An idea to change the economic structure of the country	223
	- Shivani N. Patel, Jenil A. Delvadiya, Dr. Pushpalata S. Patil, Prof. Chhabildas Gajare	
33.	Impact of politics on Indian Education System	230
	- Vikas R. Rathod, Hardik Bhabhera, Dr. Pushpalata S. Patil, Prof. Chhabildas Gajare	
34.	A Study of Cashless Economy In India	234
	- Dr. Laxman K. Karangale, Dr. Babu S. Waghmode	
35.	The Essence of Green Marketing	244
	- Dr. Anamika Gautam Ghosh	
36.	Recent Trends in Commerce, Economics & Management: Teaching, Travel and Tourism Management	250
	- Dr. Sunil Borchate	
37.	भारतातील रोकडरहित (कॅंगलेस) व्यवहार-विविध पर्याय	256
	- श्री दत्ता त्र. जाधव	
38.	E-Wallet The New Cashless Economy	263
	- Mr. Bhushan Shirampant Mangate	
39.	ICT Based Teaching Learning Evaluation and Future ...271	
	- Vishwanath P. Hissal, Dr. Laxman K. Karangale	

प्रा. डॉ. जयंत डी. पो
पो. से. महाविद्यालय, खामगांव.

'सहकार' या शब्दाचा शब्दशः अर्थ परस्परात सहाय्य करणे, एकमेकास मदत करणे किंवा सर्वांच्या हितासाठी संघटीत व एकत्रित काम करणे असा होतो. सहकार हा शब्द दैनंदिन व्यवहारात येत असतो. सहकार या शब्दाची फोड म्हणजे सह+कार सह म्हणजे बरोबर व कार म्हणजे काम या अर्थाने वापरला जातो. म्हणजेच एकमेकांच्या सहकार्याने केलेले कार्य म्हणजे सहकार होय. भारतीयांना सहकार हा शब्द नवीन नाही. भारतात देशव्यापी स्तरापासून तर अगदी ग्रामीण भागापर्यंत सहकार पोहचलेला आहे व त्यामधून समाजाची प्रगतीची प्रक्रिया सुरुच आहे.

शोध शब्द – स्वयंमदत, सहकारी संस्था, उन्नती,

सध्याच्या आर्थिक स्थितीत जिवनात प्रत्येक व्यक्तीची विचारधारा ही आत्मकेंद्री झाली आहे. त्याच कारणाने सहकाराच्या विविध योजना या फलश्रुत येत नाहीत. हाच विचार लक्षात घेवून प्रस्तुत शोध निबंध विषय मांडण्याचा प्रयत्न करण्यात आलेला आहे.

संशोधनाचे उद्देश :

प्रस्तुत शोध निबंधासाठी खालील उद्दिष्टे आहेत.

1. सहकाराच्या माध्यमातून स्वयंमदत करणे.
2. सहकारी संस्था - सेवाभाव वाढविणारी संस्था आहे हे पाहणे.
3. सहकारी संस्था एक सामाजिक व आर्थिक चळवळ आहे याची माहिती घेणे.
4. ग्रामीण भागाकरिता सहकार आवश्यक आहे.

संशोधन पध्दती :

वस्तुस्थिती जाणून घेण्यासाठी एखाद्या विषयाचा बारकाईने समीक्षात्मक अभ्यास म्हणजे संशोधन हे होय या संशोधनासाठी प्रमाणीत केलेल्या पध्दतीला संशोधन पध्दती असे म्हणतात.

प्रस्तुत शोध निबंध द्वितीयक सामुग्रीवर आधारित असून त्यासाठी पुस्तके,

मासिके, शासकीय दस्तऐवज, वर्तमानपत्रातील माहिती, इंटरनेट इत्यादीचा उपयोग केला आहे. स्वयंमदत हा एक उन्नतीचा मार्ग आहे. स्वयंमदत ही आत्मकेंद्रीत संकल्पना असून स्वयंमदत हा विचार जेव्हा येतो तेव्हा आपोआपच स्वतःकडे व समाजाकडे पाहण्याचा दृष्टीकोन बदलतो सहकार या संकल्पनेचा शब्दशः अर्थ परस्परात सहाय्य करणे, एकमेकांना मदत करणे किंवा सर्वांच्या हितासाठी संघटीत व एकत्रीत काम करणे असा आहे. सहकारा शिवाय मानवी विकास अशक्य आहे.

सुरवातीच्या काळात सहकाराची बीजे धार्मिक कल्पना, धार्मिक परंपरा, सामाजिक चालीरीती यात होती, परस्पर सहाय्य सामुदायिक कार्य, सामाजिक मालमत्ता यांचे विचार धार्मिक ग्रंथातून मांडलेले आडळतात, कौटील्याच्या अर्थशास्त्रात सुध्दा सहकार विषयाचे मोलाचे विचार मांडलेले आहेत. भारतातील पांशापीक ग्रामीण जिवन हे सहकाराचे एक उत्तम उदाहरण आहे. सहकारामध्ये आर्थिकदृष्ट्या संपन्न घटक, हा महत्वाचा नसून आर्थिकदृष्ट्या दुर्बल घटकांना सहकाराच्या माध्यमातून प्रगती पथावर नेणे हे एक मुख्य लक्षण समजले जाते. म्हणूनच सहकार म्हणजे 'व्यक्तींनी स्वईच्छेने एकत्रीत येवून स्वतःच्या व सर्वांच्या आर्थिक हितरक्षणाकरिता व वृध्दीसाठी समतेच्या पावावर स्थापन केलेली संघटना म्हणजे सहकारी संस्था होय', समाजातील आर्थिकदृष्ट्या संपन्न घटकाचे सहकार्य घेण्याची शिफारस सहकारात होत असली तरी मुख्य केंद्रबिंदू मात्र दुर्बल घटकच समजल्या जातो. 'एकमेका सहाय्य करू अल्पे धरू सुपंध' या तत्त्वानुसार समानतेच्या आधारावर विविध सहकारी योजनांची अंमलबजावणी करून सभासदांचा विकास होवू शकतो.

सहकार हा एक समाज जीवनाचा मार्ग आहे. हा मार्ग आर्थिकदृष्ट्या दुर्बल घटकांसाठी आर्थिक उन्नतीचा ठरतो आहे. समाजाची उन्नती करण्यासाठी प्रायःकव्यक्ती, समाज व शासन महत्वाचे घटक आहेत. सहकार म्हणजे 'एकासाठी सर्व व सर्वांसाठी एक' हे आहे. सहकार चळवळीमध्ये मोठ्या प्रमाणावर सहकारी संस्था स्थापन झालेल्या आहेत. व त्या संस्थांच्या माध्यमातून विकास झाल्याचे दिसत आहे. यामध्ये प्रामुख्याने महाराष्ट्रातील वारणानगर येथील वारणा सहकारी दूध उत्पादन संघ, गुजरात मधील अमुल दूध उत्पादन संघ ही उदाहरणे आहेत सहकारी संस्थांनी सहकाराचे तत्त्व व सामाजिक जबाबदारी पार पाडली तर संस्थेची उन्नती व त्याच बरोबर सभासदांची व समाजाची उन्नती घडून येईल.

सहकाराचे फायदे :

1. सुलभ स्थापना - कोणतेही १० सज्जन व्यक्ती स्वच्छेने एकत्र येवून

कोणतीही सहकारी संस्था स्थापन करू शकतात. कंपनीपेक्षा सहकारी संस्थेची नोंदणी पध्दत खूप सरळ व सोपी आहे. सहकारी संस्थेच्या स्थापने विषयी कायदेशीर बाबी पूर्ण करण्यास फार खर्च येत नाही.

२. **अबाधित अस्तित्व** - सहकारी कायदयामुळे सहकारी संस्थेला स्वतंत्र अस्तित्व मिळाल्यामुळे सहकारी संस्था सभासदांपेक्षा वेगळी समजली जाते त्यामुळे संस्थेच्या सभासदांच्या निवृत्तीमुळे, मृत्युने किंवा दिवाळखोरीने संस्थेचे अस्तित्व धोक्यात येत नाही. संस्थेचे कार्य अखंडीत सुरु राहते.
३. **करात सवलत** - सहकारी संस्थेमार्फत सभासदांसाठी केलेल्या कामासाठी व संस्थेने मिळविलेल्या उत्पन्नावर शासनाकडून प्राधान्याने करात सवलती मिळतात. सहकारी संस्थेसाठी कमी दराने कर आकारण्यात येतो.
४. **सरकारी मदत** - आपल्या देशात सहकारी चळवळ ही सरकारी धोरणाचा एक भाग म्हणून समजली जाते. त्यामुळे सहकारी तत्वांवर व्यापार उद्योग संस्थेला सरकारकडून प्रोत्साहन, अनुदान, कमी व्याजदराने भांडवल व इतर अनेक सवलती उपलब्ध आहेत.
५. **स्वावलंबनाच्या प्रवृत्तीत वाढ** - सहकारी संस्थेचे सभासद समानतेच्या आधारावर सपरस्परांच्या गरजा पूर्ण करण्याकरिता एकत्रीत आलेले असतात. सहकारामुळे दुसऱ्यावर अवलंबून राहण्याची प्रवृत्ती कमी होते. आणि त्या ऐवजी स्वावलंबनाची प्रवृत्तीत वाढीला लागते.

सहकाराचे तोटे -

१. **मर्यादित क्षेत्र व भांडवलावर मर्यादा** - सहकारी संस्थेचे भांडवल मर्यादित असते कारण या संस्थेचे सभासद एका विशिष्ट गटाचे असतात व त्याचे उत्पन्न मर्यादित असते. भांडवलावर कमी प्रमाणात लाभांश मिळत असल्यामुळे मोठ्या प्रमाणावर भांडवल उभारणी शक्य होत नाही.
२. **सरकारचे नियंत्रण** - प्रत्येक सहकारी संस्थेवर सहकारी खात्याचे आणि सरकारी यंत्रणेचे नियंत्रण असते, त्याचा संस्थेवर विपरीत परिणाम होतो.
३. **अकार्यक्षम व्यवस्थापन** - सहकारी संस्थेचे व्यवस्थापन संचालकांच्या कार्यकारी समिती मार्फत चालते. या संचालकांना व्यवस्थापनाचा अनुभव नसतो. त्या कारणाने सहकारी संस्था अकार्यक्षम व

अव्यवस्थितरीत्या काम करतांना दिसतात.

४. **घोटाळे** - कोणत्याही सहकारी संस्थांच्या संचालनात सहकारी तत्वांचे पालन, सेवा भाव, निस्वार्थ भावना व योग्य नेतृत्व ह्या गोष्टी नसल्यातर सहकारी संस्थेत घोटाळे होतात. भारतातील बहुतेक सहकारी संस्थांमध्ये हे आढळून येते.
५. **राजकीय हस्तक्षेप** - अलीकडील काळात सहकारी संस्था राजकारणाचे मुख्य स्थान बनू पाहत आहेत. तसेच राजकीय संस्था काबीज करण्यासाठी प्राथमिक केंद्र म्हणून विविध राजकीय पक्षाचे पुढारी सहकारी संस्थेकडे बघतात. त्या कारणाने संस्थेच्या सभासदात मतभेद निर्माण होतात व संस्थेचे मुळ अस्तित्व लोप पावते.

निष्कर्ष :

१. सामान्य माणसाच्या विकासाकरिता सहकारी स्तरावर अनेक योजना आहेत. परंतु अजूनही पाहिजे तितका विकास झालेला नाही.
२. सहकारी संस्था योग्यप्रकारे कार्यान्वीत नाहीत.
३. गरजू व्यक्तींना सहकारी संस्थांचा योग्य फायदा होईलच असेही नाही.
४. काही विशिष्ट व्यक्तींना, संचालकांना जास्त फायदा होतो.

शिफारशी :

१. खऱ्या गरजूवंताना या सहकारी संस्थांचा लाभ मिळावा.
२. सहकारी संस्थेतील गैरप्रकाराला आळा बसावा.
३. सहकारी बँका, वित्तीय संस्थांनी कर्जात सुरळीतपणा ठेवावा.
४. सहकारी संस्थांच्या माध्यमातून सर्वांचा विकास व्हावा.

संदर्भसुची :

१. सहकार तत्वे आणि व्यवहार - मधुकर गावंडे, प्रकाश जैन, विजयकुमार एस. भांगडीया, हिमालया पब्लिशिंग हाउस,
२. सहकार , प्रा.आर.एस.पाटील - प्रा.सानप
३. सहकार तत्वे आणि व्यवहार - राम खेडकर, डांगे,
४. लोकराज्य
५. वर्तमानपत्र, लोकमत, देशौनती
६. इंटरनेट



Shikshan Prasarak Mandal, Akola's
SHANKARLAL KHANDELWAL
ARTS, SCIENCE & COMMERCE COLLEGE, AKOLA (MS) INDIA

Affiliated to Sant Gadge Baba Amravati University, Amravati
 (Reaccredited by NAAC, Grade "B" with CGPA 2.88)

CERTIFICATE



International Interdisciplinary Virtual Conference on
INNOVATIONS AND CHALLENGES
IN COMMERCE, HUMANITIES, SCIENCE AND TECHNOLOGY
ICCHST-2022

Wednesday, 23rd FEBRUARY, 2022

In Collaboration with
VIDARBHA CHAMBER OF COMMERCE & INDUSTRIES (VCCI)



Knowledge Partner
KHANDELWAL TOTAL SOLUTIONS (PVT.) LTD.

This is to certify that **Dr. J. D. Porey** of **G. S. Science, Arts & Commerce College, Khamgaon** has presented a paper entitled: **CYBER SECURITY ANALYSIS OF INTERNET BANKING IN EMERGING COUNTRIES** in the "International Interdisciplinary Virtual Conference on: Innovations and Challenges in Commerce, Humanities, Science and Technology", organized by Department of Accounts & Statistics, Shankarlal Khandelwal Arts, Science and Commerce College, Akola (MS) on Twenty Third day of February 2022.



Scan to validate


 Dr. Piyush U. Nalhe
 Organizing Secretary


 Dr. Archana P. Khandelwal
 Convenor


 Mr. Nitin Khandelwal
 President, VCCI


 Dr. J.M. Saboo
 Principal

Impact Factor -(SJIF) –8.572
ISSN - 2278 -9308

FEBRUARY 2022
ISSUE NO. (CCCXXXVII) 337

B.Aadhar

Peer - Reviewed & Refereed Indexed

MULTIDISCIPLINARY INTERNATIONAL RESEARCH JOURNAL

International Interdisciplinary Virtual Conference on

INNOVATIONS AND CHALLENGES IN COMMERCE, HUMANITIES, SCIENCE AND TECHNOLOGY

ICCHST-2022



Editors

Dr. Archana P. Khandelwal

Dr. Jagdish M. Saboo



This Journal is Indexed in

Scientific Journal Impact Factor (SJIF)
Cosmos Impact Factor (CIF)
International Impact Factor Services (IIFS)



For Details Visit to : www.aadharsocial.com

Aadhar PUBLICATIONS



B.Aadhar

Peer-Reviewed & Refereed Indexed
Multidisciplinary International Research Journal

February, 2022

ISSUE No- (CCCXXXVII) 337-B

ICCHST-2022

Prof. Virag.S.Gawande

Chief Editor

Director

Aadhar Social Research &, Development Training Institute, Amravati.

Editor

Dr.Archana P. Khandelwal

Dr.Jagdish M. Sahoo

SHANKARLAL KHANDELWAL ARTS, SCIENCE AND COMMERCE COLLEGE,
AKOLA (MS)

Aadhar International Publication

For Details Visit To : www.aadharsocial.com

© All rights reserved with the authors & publisher

INDEX -B

No.	Title of the Paper	Authors' Name	Page No.
1	Changing aspects of cyber security using the implementation of Blockchain Technology	Aditya Khandelwal	1
2	Relationship between the Efficient Leadership Styles and Organizational Efficiency by inquiry Managing Director and Managers of Public Sector Organizations	Dr. Senthamil Raja Andi Selvam	5
3	Use of WINSIS as a tool for supporting Information Literacy Programme	Dr. Sachin G. Mahajan	15
4	Formulation of Research Problem	Dr. Sachin G. Mahajan	23
5	Covid-19 pandemic and employment generation in indian economy	Dr. Sandip Bhaskarrao Jagtap	26
6	A Study on Perspectives of EntrepreneurshipDevelopment	Dr. Rupa Z Gupta	29
7	Digital Marketing: A New Career Opportunity in India	Dr. Ramesh P. Deshmane	34
8	A conceptual study on tools and techniques to manage stress to ensure the work life balance.	Dr.Pallavi Mandaogade	39
9	Women Empowerment in Rural Areas – A Critical Study	Dr. Nilima Sarap (Lakhade)	44
10	“Blockchain Technology – A Conceptual Study”	Dr. Nilesh N. Chotiya	48
11	Cryptocurrency and Digital Assets.	Dr. Narendra Haribahu Shegokar	51
12	Impact of Covid-19 on the Indian Economy And Agriculture Sectors	Dr. J.M. Saboo / Dr. Monika Saboo	55
13	Understanding ‘Kaizen’ as a Powerful tool for Continuous Improvement	Dr. Mithila B Wakhare	59
14	Cyber Security Analysis Of Internet Banking In Emerging Countries	Dr. M. S. Gaikwad / Dr. J. D. Porey	62
15	Opportunities and Challenges in Commerce Higher Education in Indian Perspective	Dr. Lalchand D. Bodile	66
16	GST and Indian Economy	Prof. Dr. Jyoti R. Maheshwari	69
17	Trade in SAARC directions: an analytical study	Dr. Ghuge Sunil Balu	72
18	A Study on Bitcoin in Akola City	Dr. Devendra N. Vyas	77
19	The Contribution Of Information Technology In Accounting	Dr. Deepika Vishal Santoshwar	82
20	Forensic Accounting & Its Current Concerns	Dr. Deepak S. Jejani	87
21	Use Of Ict Tools And Free Technological E- Resources In Teaching Learning Process	Pr of. Dr. Deepak D. Nilawar	91
22	Impact Of Covid-19 Pandemic On Indian Economy	Dr. Dnyaneshwar Vishnu Gore	95



Cyber Security Analysis Of Internet Banking In Emerging Countries

Dr. M. S. Gaikwad & Dr. J. D. Porey

Professor, G. S. Science, Arts & Commerce College, Khangaon – 444303 District – Buldana.

Abstract

Internet banking has become one of the fastest and easiest ways of banking. The threat of cyber security attacks set a great challenge for the Internet banking and electronic commerce (E-commerce) industries. In this paper, we first analyze in detail the cyber security of Internet Banking in Emerging Countries and then propose a novel model to reduce the cyber security risk to bridge the gap between banks and customers. The proposed model is based on results of surveys conducted on Internet banking in three emerging countries (Saudi Arabia, Pakistan and India). The survey focused on users practices in Internet banking. The questions were based upon user's knowledge about cyber security and user's awareness of common threats in Internet Banking. The results obtained support the argument that there is an emerging gap between banks expectation and user actions related to Internet banking. The proposed model bridges the gap taking into account user's IT literacy and IT equipment (Hardware and Software) increasing the responsibility of banks to reduce the cyber security risks for users.

Introduction

Internet banking also known as electronic banking (E-banking), online banking and Virtual banking is widely promoted as a convenient banking solution. Internet banking has proved to be an ideal and profitable means of banking in the banking industry. Most banks have quickly migrated to this technology in order to reduce cost and improve customer experience.

- [1] The process of adoption of technology depends on information gathering and set of belief that will help the user in either accepting or rejecting it.
- [2] The technology acceptance model or TAM determines that the user acceptance of technology is driven by two factors namely ease of using that technology and usefulness of the technology
- [3] Adoption of technology is the greatest challenge for the banking industry. Some of the risk associated with the Internet banking users are users themselves; their behaviour when it comes to E-banking
- [4] Internet banking security risk can cause financial losses if the risk is real. Financial sectors and banking sectors are more prone to security attacks
- [5] User acceptance is one of the key factors in the acceptance of technology. To work on Internet banking requires a certain level of information technology literacy. Users may not be comfortable in trusting a totally automated system
- [6] Despite the fact that banks in emerging countries have integrated security features yet users behavior causes security vulnerabilities.

A lot of internet security threats and vulnerabilities still continue to persist. An example is Internet banking users sharing their login credentials with others knowingly or unknowingly. As new threats continue to emerge, banks will need to adopt new measures to protect users. Banks can do more by deploying Information Security policies that ensure safer Internet banking experience. The Information Technology security policies could consist of items related to users and machine based learning or Artificial intelligence, which would learn users' pattern while conducting Internet banking. For example, the bank artificial intelligence could detect trusted devices like trusted laptop or mobile device, which the user use for his daily banking activities and if the user logged in from a different device, it will send a notification on the registered mobile number of the users. In this study a novel model is proposed which puts more responsibility on banks to avoid security breaches which are caused due to negligence or lack of awareness by the users.

The responses from the conducted survey highlighted two aspects regarding users:



1) User behaviour while conducting Internet banking and 2) User awareness on threats relates to Internet banking. Some of the negative response are related to lack of awareness of users on threats related to Internet banking. It would be difficult for users to cope with the changing technologies and threats. So the logical solution could be that banks could control the process by imposing information technology policies that can help bridge the gap that lead to a safer E-banking environment and reduce the possibility of security breaches. They can use behavioural study or model that are based on Artificial Intelligence or Machine based Learning that could provide early-detection of negligence of users or target those domains which could lead to a security breach on Internet banking.

A population sample of 476 random customers' responses were analysed. In the dimension of study, factor analysis-varimax rotation was used and simple regression was used to see the influence on perceived privacy and security, ease of use, quality of service and customer feedback on Internet banking. All the factors chosen for the study were independent but the factor that have the most impact in influencing the customer trust was the quality of service provided on the website. The acceptance of the Internet banking was found in the audience that had high education level and good amount of computer literacy.

Research Methodology

In this study, the research methodology is designed by selecting 3 emerging countries namely Saudi Arabia, India and Pakistan. A survey was designed with questionnaire divided into two parts; the general practice of users on the Internet banking and awareness of the threats related to Internet banking. Based on the survey's positive and negative responses, a model is proposed that can bridge the gap between banks expectation and user behavioural response when it comes to Internet banking. To support the argument about the importance of internet banking, detailed analysis about the total internet users against the total population of each selected country.

User Practices for Internet Banking Some of the practice that a user is expected to follow while in the Internet banking environment: 1. Maintaining up to date operating system on personal computers that can protect the user from malware. Downloading software from 3rd party is a common practice by users. Most of the users are unaware of the malicious code that are hidden in the software. 2. Using browser with less vulnerabilities. Browsers are the most likely item targeted by cyber attackers. Users can get compromised if they are not updating their browser. 3. Password management: Choosing a complex password which include a combination of capital, small letters, numbers and special character. This can make the password difficult to guess and avoid unauthorized access. 4. Reading banking agreement. As per our survey it highlights that users do not read the online banking agreement which highlights the user's responsibilities and a point where banks would like to educate users about the sensitive nature of Internet banking. The online banking agreement consists of information of protecting your password, credit cards and pin number.

Proposed Security model required to decrease the security risks in Internet banking. Banks should use the concept of trusted device to ensure the identity of the users while the user is logging on. If the user has logged in from an entrusted device the bank system should send an SMS alert to confirm if it was the intended user. Education of the users is a key component to ensure safe Internet banking experience. The bank can provide security warning on their WebPages after the user has successfully logged in to familiarize users on the threats that are risk for Internet banking. Banks should use Artificial intelligence software or machine based learning software that can make judgments on the user behavior example transferring large amount of cash to a destination not within the monthly pattern of the user. This software can be used to detect all electronic transactions including credit card transaction and will be able to detect if the user has made a purchase not within the customer's pattern and will alert and sometimes disable the credit card or E-banking account in extreme cases until the customer's identity is verified. The machine based learning or artificial intelligence should predict this anomaly and take appropriate action. Information security is a critical part of the Internet banking process. Therefore,



banks can improve the security features from their side by securing their servers and the communication between the user and Internet banking server. Table 4 describes the list of security features that each bank should incorporate to ensure the security of user's data and communication. User should change password every 3 months. Use virtual keyboard to enter password rather than keyboard to avoid malicious code like key logger. Use trusted device and avoid using public network for e banking Educate the user of online threat by posting a warning message after user successfully login. User should follow the security practices enlisted on the banking website Bank1. Banks should force user to change password.2. Enforce complex password.3. No repetition of previous 2 passwords. Bank enforcing users to use virtual key board by disabling keyboard login.Bank should send a sms notification/email if a login was detected from an untrusted device similar to google policy Banks should send sms tips for safe Internet-Banking experience Banks should do more to enforce security practies by using AI or machine based learning to detect any unusual behaviour of Internet-Banking user

Security Features of the Internet banking proposed model Description

1. SSL Certificate Secure Socket Layer (SSL) certificate need to be installed for E-banking website and other substitute websites representing banks.
2. Device Registration User access devices (laptops, smart phones, tablets etc.) will be registered and after verification, only that device will be able to access E-banking systems.
3. System based Alarms Setup of different Server based alarms to monitor and control the bank transactions and access of the user accounts etc.
4. Group Policies Settings Group policies are being applied to make sure that specific users have minimum required access of the internet banking system resources.
5. MFA Multifactor Authentication (MFA) methods are used to access the Internet banking administration console to make the infrastructure more secure.
6. SNS Simple notifications is enabled to the Internet banking services to which will send mobile SMS and email notifications based on the enabled system based alarms.
7. Inbound / Outbound Rules Inbound / Outbound access rules are applied and only specific communication ports (e.g. HTTPS) are opened and rest of the ports are blocked.
8. Data Encryption - Encryption is enabled to all the stored data on server by using encryption tools (e.g. bit-locker).
9. Users Access Permissions - Based on the requirement, administration users need to be created and only minimum required access to the particular service is granted.
10. Private Key with Password - To make the internet banking infrastructure access more secure, private keys with passwords need to use.

Conclusion

The Internet banking service is offered by banks to provide convenience for their customers; however, there are great benefits to banks as well. The most important benefit to banks is the reduction in operational cost is incorporating many services on their online portal. Therefore, the banks should take more responsibility in ensuring a more secure Internet banking environment for their customers. In this paper, we proposed a model that incorporates more responsibility on banks to ensure that the Information Technology policies are adhered by customers. For example, rather than informing customers that it is good practice to change password every 3-6 months, the banks should force customers to change their passwords every three months through expiring their passwords so that customers are forced to change their password. The Banks should also integrate the latest Information Security Technologies to ensure that the communication is secure between bank and customers. The proposed model would provide a more secure Internet banking environment which would be of mutual interest to both banks and customers. Also the technologies proposed in this model are existing technologies and need not be invented nor developed from scratch. For example, the trusted device concept is an available technology and already in use by non-banking industries. Google already uses trusted devices in their Gmail



application. Also there are many existing algorithms for Artificial Intelligence (AI) supervised and unsupervised learning that could be integrated to learn customer's behaviors and detect anomalies.

References

- [1] Xue, M., Hitt, L.M. and Chen, P.Y., 2011. Determinants and outcomes of internet banking adoption. *Management science*, 57(2), pp. 291-307.
- [2] Akhlaq, M.A., 2011. Internet banking in Pakistan: finding complexities. *Journal of internet banking and commerce*, 16(1), p.1.
- [3] Cheung, R. and Vogel, D., 2013. Predicting user acceptance of collaborative technologies: An extension of the technology acceptance model for e-learning. *Computers & Education*, 63, pp.160-175.
- [4] Martins, C., Oliveira, T. and Popovič, A., 2014. Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. *International Journal of Information Management*, 34(1), pp.1-13.
- [5] Ivan, I., Ciurea, C., Doinea, M. and Avramiea, A., 2012. Collaborative Management of Risks and Complexity in Banking Systems. *Informatica Economica*, 16(2), pp.128-141.
- [6] Gharaibeh, N., 2013. The impact of customer knowledge on the security of E-banking. *International Journal of Computer Science and Security (IJCSS)*, 7(2), p.81.
- [7] Council, F.F.I.E., 2005. Authentication in an internet banking environment. *Financial Institution Letter*, FIL-103-2005. Washington, DC: Federal Deposit Insurance Corp.(FDIC). Retrieved March, 18, p.2005.
- [8] Chen, C.J., 2016, July. User Adoption Decisions in Self-Service Technologies: A Study of the Internet Banking. In *Advanced Applied Informatics (IAI-AAI)*, 2016 5th IAI International Congress on (pp. 1207-1208). IEEE.

ISSN 0976-0377

RNI. MAHMUL02805/2010/33461

International Registered & Recognized
Research Journal Related To Higher Education for all Subjects



(UGC Approved, Refereed & Peer Reviewed Research Journal)

Year - XIII, Issue - XXV, Vol. - IV

Impact Factor 6.20
(GRIFI)

Jan. 2022 To June 2022

INTERLINK RESEARCH ANALYSIS

Editor In Chief

Dr. B. S. Zare

Dr. Madhulika A. Sonawane



Sr. No	Title for Research Paper	Page No.
12	A study of Impact of Covid-19 on Food and Agriculture Sector Sumit Dashrath Meshram	61
13	Customer satisfaction toward E-Banking Services provided by Private sector banks Dr. Lalchand D. Bodile	64
14	A study of the perception of women towards online shopping with reference to Nashik Prasad Sudhakar Kulkarni	67
15	Customer satisfaction toward online banking services in India Dr. Manoj M. Pimple	74
16	Impact of Covid – 19 on working in Unorganized Sector With special reference to Melghat Region Dist. Amravati Dr. Vijay R. Gawhale, Jitendra B. Tayade	78
17	Impact of changing pattern of young investor towards sustainable growth of investment market Saurabh Vinayakrao Jaswante, Dr. S. R. Raghuvanshi	82
18	Effects of changes in Raw Material price on Final Product Price in Burhanpur Power Loom Industry Dhanraj Pandit Patil, Dr. Madhulika Ajay Sonawane	88
19	Sustainable Developments In Agriculture And Food Business Dr. H. G. Dhage	93
20	Student Mentor Guidance System Kartik P. Deshmukh	98
21	A Study of Present Position of International Trade in India Rupali S. Lanjudkar, Dr. M. C. Dabre	100
22	Study of working capital management” (with special reference to Raymond Ltd. Amravati) Vaibhav N. Bankar	106
23	A Study on Impact of COVID-19 on retail market with special reference to Pune City (India) Dr. Prabhakar S. Mahale, Shilpa Dhanaji Vishvas	113

Impact of Covid – 19 on working in Unorganized Sector With special reference to Melghat Region Dist. Amravati

Dr. Vijay R. Gawhale

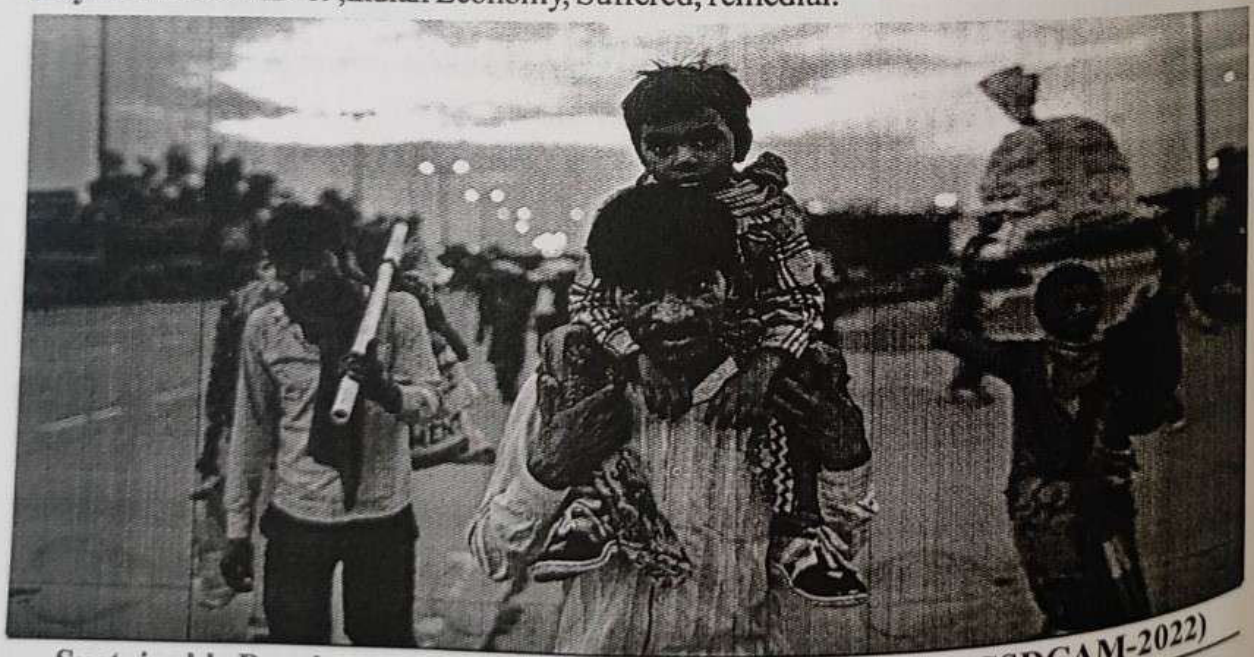
Department of Commerce & Management
G.S. Science Arts & Commerce College
Khamgoan, Dist. Buldhana

Jitendra B. Tayade
S.G.B.A.U. AMRAVATI.

ABSTRACT

COVID-19 has taken the world by storm. The virus, along with the lockdown, had a disastrous effect on the economy. The Indian economy is heading towards a double-digit plunge while the cases skyrocket. Although the impact on the economy is widespread, the unorganized sector has suffered and continues to suffer the most. This article attempts to assess the damage done and discuss the remedial measures. In India, about 40 to 45 crore people in the unorganised sector go to other states to get employment. A large number of tribal people live in Melghat area of the Amravati range. They have to go to Maharashtra or Madhya Pradesh to get employment for employment. Because they have only three months of employment available in their areas. For this, secondary information has been taken as a basis for the writing of the search article. And on that basis, this research article has been written.

Keywords: COVID-19, Indian Economy, Suffered, remedial.



Introduction:

COVID-19 has taken the world by storm. The virus, along with the lockdown, had a disastrous effect on the economy. The Indian economy is heading towards a double-digit plunge while the cases skyrocket. Although the impact on the economy is widespread, the unorganized sector has suffered and continues to suffer the most. This article attempts to assess the damage done and discuss the remedial measures.

Impact on unorganised sector

The unorganised sector consists of unincorporated enterprises owned by individuals and households in the production and sale of goods and services with less than 10 employees. The pandemic severely impacted the following industries:

Migrant workers and the labour force

The already declining labour market faced a further decline due to the pandemic. According to the 2018-19 data, 52% of the labour force is self-employed. 24% were casual workers without any financial security and the remaining 24% were regular waged workers. The shock of the pandemic affected the labour force unequally. The crisis accentuated the pre-existing inequality in the labour market. The hierarchical order of labourers based on their incomes and social security is as follows:

1. Regular formal employed
2. Regular informal employed
3. Self-employed
4. Casual workers

The regular formal employed are the least affected. Coupled with job tenure, high salaries, and social security, they are in a comfortable position. They can enjoy the privilege of working from home. The situation is more or less similar in the case of regular informal employment. The self-employed are also adversely affected, but depending on the industry, they receive enough remuneration to sustain themselves.

The less-educated casual workers who engage in low paying work are the most affected. They work in unstable conditions and are susceptible to layoffs. Physical distancing, safety measures, along the fear of contracting the disease itself, the casual workers are left to face the brunt of the pandemic. The CMIE(Centre for Monitoring Indian Economy) predicted 112 million job losses from April-May 2020, the majority of which are self-employed and casual workers. According to the World Economic Forum, India has around 139 million migrant workers. The pandemic caused severe hardships to the migrants.

Most of the migrants are casual workers or daily wage workers. With the lockdown in effect, many were jobless. The ILO predicted that the pandemic would push 400 million workers to poverty. Their pathetic situation forced the migrants to return to their villages. Without money,



food, and transportation, many migrants either walked or cycled on their return. Travelling in large numbers made physical distancing impossible. More than 300 migrant workers died from various reasons like starvation, accidents, and not receiving timely medical care. There was an influx of migrants as the states eased the lockdown restrictions.

Objectives:

- 1) To study the unorganised sector workers who were the worst hit during the Corona period.
- 2) To study the classification of workers in the unorganized sector.
- 3) To study the jobs lost to the workers in the unorganised sector during the Corona period and those who fell when they died.

Review of Literature:

* (Mansoor, 2021), COVID-19: Lockdown Impact on Informal Sector in India, according to the ILO report, in India, more than 40 crore informal workers may get pushed into deeper poverty due to COVID-19 outbreak and sectors such as hospitality and accommodation, retail and wholesale, business services, construction and industry have suffered drastic consequences with a decrease in production and loss of hours and employment figures. In total, 1.25 billion workers in these industries, more than a third (37.5%) of the world's workers are at high risk. The condition of low-paid and low-skilled informal workers is very worrying in the low- and middle-income countries where industries and services employ a large proportion of these workers, who account for 61% of the global workforce or 2 billion people and lack social protection or a safety net.

Hypothesis:

* During the corona pandemic, people in the unorganized sector lost their jobs and their financial condition worsened.

Research Methodology:

In India, about 40 to 45 crore people in the unorganised sector go to other states to get employment. A large number of tribal people live in Melghat area of the Amravati range. They have to go to Maharashtra or Madhya Pradesh to get employment for employment. Because they have only three months of employment available in their areas. For this, secondary information has been taken as a basis for the writing of the search article. And on that basis, this research article has been written.

Limitations:

- 1) In these research articles, workers in the unorganized sector have been studied.
- 2) This search article relies on secondary information.
- 3) The findings obtained from the research are based only on available literature.

Conclusion:

In India, a large number of people go to the unorganized sector to look for employment. In a developing country like India, during the corona period, people in the unorganised sector lost their jobs and had to be displaced, their social and economic condition deteriorated, which seems to have affected their family status. Melghat is home to a large number of tribal people who are displaced to Amravati or other places to find work but their financial condition has been found to have worsened due to lack of employment during the corona pandemic.

Reference:-

- 1] Impact of pandemic on the unorganised sector : short term remedies and a long term approach - iPleaders.
- 2] ResearchGate
- 3] Mansoor, K. C. (2021). COVID-19: Lockdown Impact on Informal Sector in India. University practice connects, 1-12.
- 4] Impact of COVID-19 on informal workers |Policy Support and Governance| Food and Agriculture Organization of the United Nations (fao.org)
- 5] COVID-19 impact: Women employed in India's informal sector report food insecurity, financial and social exclusion-India News, Firstpost.

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/361786370>

A Study on Bitcoin in Akola City

Conference Paper · July 2022

CITATIONS

0

READS

17

1 author:



[Devendra Narayan Vyas](#)

G. S. Science Arts & Commerce College Khamgoan

18 PUBLICATIONS 271 CITATIONS

SEE PROFILE

Impact Factor -(SJIF) –8.572
ISSN - 2278 -9308

FEBRUARY 2022
ISSUE NO. (CCCXXXVII) 337

B.Aadhar

Peer - Reviewed & Refereed Indexed

MULTIDISCIPLINARY INTERNATIONAL RESEARCH JOURNAL

International Interdisciplinary Virtual Conference on

INNOVATIONS AND CHALLENGES

IN COMMERCE, HUMANITIES, SCIENCE AND TECHNOLOGY

ICCHST-2022



Editors

Dr. Archana P. Khandelwal

Dr. Jagdish M. Saboo



This Journal is Indexed in
Scientific Journal Impact Factor (SJIF)
Cosmos Impact Factor (CIF)
International Impact Factor Services (IIFS)



For Details Visit to : www.aadharsocial.com

Aadhar PUBLICATIONS

**INDEX -B**

No.	Title of the Paper	Authors' Name	Page No.
1	Changing aspects of cyber security using the implementation of Blockchain Technology	Aditya Khandelwal	1
2	Relationship between the Efficient Leadership Styles and Organizational Efficiency by inquiry Managing Director and Managers of Public Sector Organizations	Dr. Senthamil Raja Andi Selvam	5
3	Use of WINSIS as a tool for supporting Information Literacy Programme	Dr. Sachin G. Mahajan	15
4	Formulation of Research Problem	Dr. Sachin G. Mahajan	23
5	Covid-19 pandemic and employment generation in indian economy	Dr. Sandip Bhaskarrao Jagtap	26
6	A Study on Perspectives of Entrepreneurship Development	Dr. Rupa Z Gupta	29
7	Digital Marketing: A New Career Opportunity in India	Dr. Ramesh P. Deshmane	34
8	A conceptual study on tools and techniques to manage stress to ensure the work life balance.	Dr. Pallavi Mandaogade	39
9	Women Empowerment in Rural Areas – A Critical Study	Dr. Nilima Sarap (Lakhade)	44
10	“Blockchain Technology – A Conceptual Study”	Dr. Nilesh N. Chotiya	48
11	Cryptocurrency and Digital Assets.	Dr. Narendra Haribahu Shegokar	51
12	Impact of Covid-19 on the Indian Economy And Agriculture Sectore	Dr. J.M. Saboo / Dr. Monika Saboo	55
13	Understanding ‘Kaizen’ as a Powerful tool for Continuous Improvement	Dr. Mithila B Wakhare	59
14	Cyber Security Analysis Of Internet Banking In Emerging Countries	Dr. M. S. Gaikwad / Dr. J. D. Porey	62
15	Opportunities and Challenges in Commerce Higher Education in Indian Perspective	Dr. Lalchand D. Bodile	66
16	GST and Indian Economy	Prof. Dr. Jyoti R. Maheshwari	69
17	Trade in SAARC directions: an analytical study	Dr. Ghuge Sunil Balu	72
18	A Study on Bitcoin in Akola City	Dr. Devendra N. Vyas	77
19	The Contribution Of Information Technology In Accounting	Dr. Deepika Vishal Santoshwar	82
20	Forensic Accounting & Its Current Concerns	Dr. Deepak S. Jejani	87
21	Use Of Ict Tools And Free Technological E- Resources In Teaching Learning Process	Prof. Dr. Deepak D. Nilawar	91
22	Impact Of Covid-19 Pandemic On Indian Economy	Dr. Dnyaneshwar Vishnu Gore	95

**A Study on Bitcoin in Akola City****Dr. Devendra N. Vyas**

Principal ,Smt. Radhadevi Goenka College for Women, Akola, devvya@gmail.com ,7588041801

Abstract:

We all are living in digital era where digital transformation is taking place in every quant. Hence, it is a need of hour to accept the changes of era and updates ourselves in the same way. Digital Currency is one of the most important aspects of study specially here Bitcoin. Hence Researcher has chosen Akola City because it is just a sample like in Akola city, people are preferring Bitcoin as an investment perspective which is also giving good result. In this paper, researcher is trying to understand the Digital Market sector in Akola City which definitely support to take decision of investment so that it can generate profit and strengthen financial needs in 21st century.

Keywords:Digital Currency, Bitcoin, Investment**Introduction:**

Digital Currency is growing now a day. It has intrinsic value like a physical currency and they allow for instantaneous transactions that can be seamlessly executed for making payments across borders when connected to supported devices and networks. For example, it is possible for an American to make payments in digital currency to a distant counterparty residing in other country, provided that they both are connected to the same network required for transacting in the digital currency. This research focuses on understanding the Digital market and how it is helpful and can be used to generate income which effect on an individual economic growth. Similar study can be conducted incorporating other variables rather than the ones used in this study i.e Bitcoin..

Objective of Study

- To Study Digital currency.
- To analyze risks and benefits of Digital Currency.
- To analyze how investors are benefited in Digital Currency.
- To know the perspective of investor in Akola City.

Hypotheses:

- There is a positive perception of customers about investment in Digital Currency.
- The investment in Bitcoin is not reliable.

Limitation of the Study:

Data is collected from 100 customers from Akola District and all age groups are considered. The study is limited only for the financial year 2020-2021

Research Methodology:

While writing this research paper, Primary and Secondary data has been used. For the analysis Descriptive Method is used.

Discussion & Results:

1. To see th It is clear from above table that out of total respondents, 40 % of the respondent are in age group of 20-30, 15% of 30-40, 20% of 40-50, and 25% of 50-60 for the bitcoin Project

2. To see the Respondent is also a Share Market Trading:

Sr. No.	Option	No. of Respondent (%)	Respondent
1	YES	50%	50
2	NO	50%	50
	TOTAL	100%	100

e Respondent is an Age:

It is clear from above table that out of total respondents, 40 % of the respondent are in age group of 20-30, 15% of 30-40, 20% of 40-50, and 25% of 50-60 for the bitcoin Project

2. To see the Respondent is also a Share Market Trading:

Sr. No.	Option	No. of Respondent (%)	Respondent
1	YES	50%	50
2	NO	50%	50
	TOTAL	100%	100

It is clear from above table that out of total respondent, 50% respondents are involved in share market trading and the rest 50% are not.

3. To see whether Respondents Invest for Long Term in Bitcoin:

Sr. No.	Option	No. of Respondent (%)	Respondent
1	YES	45%	45

Sr. No	Age	No. of Respondent (%)	Respondent
1	20-30	40%	40
2	30-40	15%	15
3	40-50	20%	20
4	50-60	25%	25
	TOTAL	100%	100
2	NO	55%	55
	TOTAL	100%	100

It is clear from above table that out total respondent, 45% of respondent invested for long terms in Bitcoin and the rest of 55% do not.

4. Investment Preference of Respondents:

Sr. No.	Option	No. of Respondent (%)	Respondent
1	Fix deposit	40%	40
2	Real Estate	35%	35
3	Insurance	10%	10
4	Bitcoin	5%	5
5	Gold	10%	10
	TOTAL	100%	100

It is clear from the table out of total respondent, 40% the respondents invested in fixed deposit, 35% invested in real estate, 10% in insurance, 5% in Bitcoin and the rest 10% are in gold.

5. Reasons of Investment Preference of Respondents:

Sr. No	Option	No. of Respondent (%)	Respondent
1	Less risk	40%	40
2	Good return	45%	45
3	Liquidity	5%	5
4	Assured return	10%	10
5	Other reasons	0%	0
	TOTAL	100%	100

It is clear above table that out of total respondents, 40% of the respondent prefer investment due to less risk, 45% due to good return, 5% due to liquidity, 10% due to assured return, and none of the other reasons.

6. Nature of Investment that the Respondents like:

Sr. No.	Option	No. of Respondent (%)	Respondent
1	Steadily	30%	30
2	At average rate	50%	50
3	Fast	20%	20
	TOTAL	100%	100

It is clear from above table that out of total respondents, 30% of the respondent like their investment to grow steadily, 50% in an average rate and the rest of 20% in a fast rate.

7. Percentage of Income that the Respondents Invest:

Sr. No	Option	No. of Respondent (%)	Respondent
1	Up to 5%	40%	40
2	5%-10%	35%	35
3	More than 10%	25%	25
	TOTAL	100%	100

It is clear above table that out of 20 respondents, 40% respondents invested 5% of their total income, 35% invested 5-10% of their income and the rest of 25% invested more than 10% of their income in Bitcoin.

8. To see whether the Respondent is Regular Investor of Bitcoin:

Sr. No.	Option	No. Of Respondent (%)	Respondent
1	YES	40%	40
2	NO	60%	60
	TOTAL	100%	100

It is clear from above table that out of total respondents, only 40% of the respondents are regular investors of Bitcoin and the rest of 60% are not.



9. The Preference among Different Investments:

Sr. No.	Option	No. of Respondent (%)	Respondent
1	Insurance	7%	7
2	Bitcoin	8%	8
3	Share Market	45%	45
4	Commodity Market	0%	0
5	Mutual Fund	40%	40
	TOTAL	100%	100

It is clear from above table that out of total respondent, 45% of the respondent prefer Share Market, 8% prefer Bitcoin, 0% prefer Commodity market, & 7% prefer in Insurance and the 40% prefer in Mutual Fund.

10. People in Akola City are aware about Bitcoin Trading and their Benefits:

Sr. No.	Option	No. of Respondent (%)	Respondent
1	YES	30%	30
2	NO	70%	70
	TOTAL	100%	100

It is clear from above table that out of total respondents, only 30% of the respondents replied, peoples in Akola city are aware about Bitcoin trading and their benefits and the rest of 70% of the respondents said, peoples in Akola city are not aware about Bitcoin trading and their benefits.

Findings

1. Based on the research results discussed in the previous chapter indicate that the investment in bitcoin still promising. The price of bitcoin rapidly increases during the study. The rate of return of bitcoin investment is the highest compared to the other investment instruments: stock, exchange rate and gold. Meanwhile, the bitcoin investment also has the highest risk compared the others investment instruments.
2. It can be concluded that bitcoin investment provides the highest return (18%) compared to other investment instrument returns. However, the very high return on bitcoin comes with high risk investment. The risk of investing in bitcoin is indicated by a standard deviation of 61%, while the standard deviation of other instruments: stock, exchange rate and gold less than 5%.
3. Based on the results of the paired sample test, it shows that the average return on bitcoin shows a very significant difference compared to the others instrument. Meanwhile, the return on the others instrument: stock, exchange rate and gold show the same return.
4. For the investors who love risk, then the investment in bitcoin could be an alternative for an investment. The investment on bitcoin promise higher return compare to the other investment instruments. For the investors who are risk aversion, an investment on bitcoin doesn't fit since this investment has the highest risk.
5. This research has practical implication for the investors who require high return. In the same time, the investors also have to understand the risk along the investment on bitcoin.
6. The other implication for government of India as policy maker on crypto currency. The crypto currency quite develops rapidly in this crypto world era. The role and regulation on crypto currency are needed to secure investors and economic growth

Conclusion

1. This paper systematized the growing research on Bitcoin published. It has segmented the publications on the basis of various elements of economics and finance such as price, demand and supply, market



efficiency, volatility and returns, and investment prospects and regulatory aspects. It also highlights the impact of social media on these factors

2. There are a few limitations to this paper. Our study only takes into account research from economics and finance perspective. Technological aspects such as blockchain and mining strategies are not considered. The focus is only on Bitcoin. There are other cryptocurrencies that are merging in the digital market. This study can be extended later to take them into account. The study might have missed out on a few important publications for the reason that it cannot be analyzed from Economics and Finance point of view. Another reason being that new studies keep emerging very frequently and some will become available later.

3. Based on our research, we enumerate a few observations and recommendations on the basis of gaps observed in the existing research. We notice that most of the findings are methodology and data frequency-dependent. Variations in the results are also observed due to differences in time periods and lack of longer periods of data. Therefore, an exhaustive study can be undertaken to discuss the limitations of different methodologies and its' implications on the results. There are very few country-specific studies conducted. Further analysis can be directed to incorporate geographical boundaries and differences in Bitcoin behavior across them (if any). Regulation norms also vary across different countries and can be analyzed. Research focusing on regulatory and legality aspects fails to suggest suitable solutions to make Bitcoin a safer and widely acceptable cryptocurrency to avoid illegal activities. The application of Bitcoin (or cryptocurrency) for the upliftment of economies and financial inclusion needs more exploration. The market for Bitcoin is very dynamic. The prices see a swift change and hence the intrinsic value also changes. Thus, the research needs to be timely updated to analyze the changing trends. The study can be extended to include other areas such as technical aspects and also take in other emerging cryptocurrencies.

References:

1. Aalborg HA, Molnár P, de Vries JE (2019) what can explain the price, volatility and trading volume of Bitcoin? *Financ Res Lett* 29:255–265
2. Akhtaruzzaman M, Sensoy A, Corbet S (2020) The influence of bitcoin on portfolio diversification and design. *Financ Res Lett* 37:101344
3. Alexander C, Choi J, Park H, Sohn S (2020) BitMEX bitcoin derivatives: Price discovery, informational efficiency, and hedging effectiveness. *J Futur Mark* 40(1):23–43
4. Ali R, Barrdear J, Clews R, Southgate J (2014) The economics of digital currencies. *Bank Engl Q Bull* 54:276–286
5. Androulaki E, Karame GO, Roeschlin M, Scherer T, Capkun S (2013) Evaluating user privacy in Bitcoin. *International conference on financial cryptography and data security*. Springer, Berlin, pp 34–51
6. Chowdhury A, Mendelson BK (2013) Virtual currency and the financial system: the case of Bitcoin (No. 2013–09). Marquette University, Center for Global and Economic Studies and Department of Economics.
7. Kayal P, Balasubramanian G (2021) Excess volatility in bitcoin: extreme value volatility estimation. *IIM Kozhikode Soc Manag Rev*. <https://doi.org/10.1177/2277975220987686>
8. Pal D, Mitra SK (2019) Hedging bitcoin with other financial assets. *Financ Res Lett* 30:30–36
9. <https://en.wikipedia.org/wiki/Bitcoin>
10. <https://coinmarketcap.com/currencies/bitcoin/>
11. <https://bitcoin.org/>
12. <https://www.investopedia.com/terms/b/bitcoin.asp>

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/361786103>

New Education Policy – An Overview of Higher Education

Conference Paper · July 2022

CITATIONS

0

READS

111

1 author:



[Devendra Narayan Vyas](#)

G. S. Science Arts & Commerce College Khamgoan

18 PUBLICATIONS 271 CITATIONS

SEE PROFILE

Impact Factor-7.675 (SJIF)

ISSN-2278-9308

B.Aadhar

Peer-Reviewed & Refereed Indexed

Multidisciplinary International Research Journal

ISSUE No- (CCCI)301

July -2021

**Impact of Race, Caste, Class and Religion on
Indian and International Society**



Prof. Virag S. Gawande
Chief Editor
Director
Aadhar Social
Research & Development
Training Institute Amravati

Dr Nitin A. Mathankar
Executive-Editor
Principal,
Late Vasant Rao Kolhatkar
Arts College, Rohana

Dr. Deoman S. Umbarkar
Editor
Organizing Secretary
,Department of Sociology
Late Vasant Rao Kolhatkar
Arts College, Rohana

This Journal is indexed in :

- Scientific Journal Impact Factor (SJIF)
- Cosmos Impact Factor (CIF)
- International Impact Factor Services (IIFS)

Aadhar Publication

For Details Visit To : www.aadharsocial.com

**INDEX**

No.	Title of the Paper	Authors' Name	Page No.
1	Role Of Communication Skills In The Development Of Tourism Industry	Dr. Vijay Madhukar Khadse	1
2	The impact of Depression on Women's Health	Dr.Trushna S. Kalambe and Asst. Prof. Swapnil M. Bhagat	3
3	Women in Tourism and Hospitality Sector of Indian Economy: Experiences of Women Workers of Cruise Ships	Ms.Sonal R Pusalkar	7
4	Scheduled Castes ,Panchayat Raj Reservation in Women Empowerment	Prof.Rupesh Kuchewar	13
5	Cross – Culture Communication Across Borders – A Study Of Literature	Dr. T. Rachel Shalini	16
6	maculata on acclimation	Bidwai. P. A./ Wankhade L.N.	20
7	Decent Work in the Informal Service Industry: A study of the Automobile Garage Workers in India.	Mr.Yatin Dhaktode	24
8	Effect of Covid-19 on Students' Education	Asst. Prof. Vaishali T. Lone	29
9	The Changing pattern of Caste Modernity and its Impact on Caste Politics in India: An Assessment	Dr.Tuhin Kumar Das	32
10	Physical growth ,Nutritional status and Mental Development of School going Children	Dr. Surekha R.Gaikwad	35
11	Depiction Of Modern Society Issues In Chetan Bhagat's Revolution-2020	Mr. Sujay S. Ikhari / Dr. Jayant Karmore	41
12	Management lessons from Bhagavad Gita	Dr. (Ms.) Subhashree Panda	44
13	Dietary intake and anthropometric measurements in preschool children	Prof. Sonal Tuljaram Kame/ Dr. SavitaSanghwan/ Dr. Yogita Sanap	50
14	Impact of Religions in Indian Society	Dr. Smita D. Rane	55
15	Observation of Nesting Pattern and Breeding Ecology of Laughing Dove (SpilopeliaSenegalensis) in Around the Hilly Region of Girna River, Tal. Kalwan, Dist. Nashik, (MS) India	Shantaram B. Bhoje/ Nalesh G. Bahiram	60
16	Effective Use of Balanced Scorecard to Evaluate the Performance of Academic Libraries	Mr. Santosh P. Khajindar	63
17	Impact of Cast , Class and Religion on Indian Politics	Prof. Dr. Sanjay Madhukarrao Salwe	69
18	A Study On Collection Development and Management of college Librari e srunby Mahatma Gandhi Mission Aurangabad	Mr. Sakharam B. Harka/ Dr. Mrs. Wadalkar R. R./Mrs. Mathdewaru B. S.	72



71	Impact Of Race,Caste,Class And Religion On Indian And International Society Dr.Deoman Shrikrushna Umbarkar	305
72	New Education Policy -An Overview of Higher Education Dr. Devendra Vyas	318
73	Stress Management for Library Professionals In Digital Environment Dr.Ashish A.Thanekar	322
74	The Dynamics Of Race, Caste, Class, And Religion On Intercaste Marriage, Nationally And Internationally Prof. Archana M. Hore	326
75	Influence of various intensities of game specific circuit training on speed and agility among handball players. Appasaheb M. Chavan	330
76	Women's Protection Inworkplace Sau.Anita Sanjay Dhurve	333
77	The Foundation Of The Indian National Congress And Active Political Awakening Of Vidarbha (1885-1890) Dr. Prashant R. Dhage	337
78	Social Category and financial exclusion with special reference to migrant women domestic workers in Nashik. Prof. Dr. Manisha P. Shukla	342
79	Impact Of Jain Caste ,Class And Religion On Their Occupation & Business Ethics In Indian Society Dr.Anjali Upadhye/ Dr.Sulakshana Chavan	348
80	“Trademark Infringement and its Remedies : A Case Study in India” Dr. Bharti R. Deshmukh	356



New Education Policy -An Overview of Higher Education

Dr. Devendra Vyas

Principal ,Smt. Radhadevi Goenka College for Women, Akola.

devvya@gmail.com ,7588041801/9423129696

Abstract:

The New Education Policy comes with new vision, new dreams and developmental aspects. It will try to cover important fact which previous policies were unable to implement. Vocational Training is a main factor which will be implemented on school level, where the quality of professionalism can be inculcate. In this paper, Researcher is trying to cover the important points where some opportunities as well as challenges are also described. Finally, the question of implementation is arising, will Government be implemented it or only is it a documentation?

Keywords:

Higher Education, Challenges, Implementation.

Introduction:

The adoption of New Education Policy will decide the future of citizens. The impact will be a long-lasting one; the choices and journeys and destinations of individual citizens and the nation will be mutually shaped by these policy decisions. So, what will change in our education system? As this policy comes with the intension of developmental aspects of nation. But it's depended on the implementation of it. After 34 years long period, Government has proposed the New Education Policy. Previous policy of 1968 & 1986 of National Education had some lacuna. New Education Policy-2020 is a policy where the rules, regulations and policies of Schools and Colleges are given. So, it gives a guideline how to administer the structure of education system of Nation. The growth and development of nation is mostly depending on Education because it is powerful tool which has a transformational capacity. In this policy, Government has done so many changes. The main purpose of this policy is to make India as a globally great. Now Ministry of Human Resource Development is known as a Ministry of Education.

Literature Review:

The Kothari Commission

- Education for innovation, national unity and literacy drawing on Nehru's vision, and articulating most of his key themes, **the Kothari Commission (1964–1966)** was set up to formulate a coherent education policy for India.
- According to the commission, education was intended to increase output, develop social and national unity, combine democracy, modernize the country and develop social, moral and spiritual values.
- To achieve this, the main pillar of Indian education policy was to be free and compulsory education for all children up to **the age of 14**.
- Other features included the **development of languages** (Hindi, Sanskrit, regional languages and the three-language formula) **equality of educational opportunities** (regional, tribal and gender imbalances to be addressed) and **the development and prioritization of scientific education and research**.
- The commission also **emphasized the need to eradicate illiteracy and provide adult education**.

National Policy on Education

- **In 1986**, a new education policy, '**The National Policy on Education (NPE)**' was announced, which was intended to prepare India for the 21st century.



- The policy highlighted the need for change: 'Education in India stands at the crossroads today. According to the new policy, the 1968 policy goals had largely been attained: more than 90 per cent of the country's rural people were within a kilometer of schooling facilities and most states had adopted a common education structure.
- The importance of science and mathematics had also been effective. However, change was required to raise financial and organizational provision for the education system to tackle problems of access and quality.

Other Important Initiatives:

- **Operation Blackboard** (1987–8) aimed to recover the human and physical resources available in primary schools.
- **Restructuring and Reorganization of Teacher Education** (1987) created a resource for the continuous advancement of teachers' knowledge and competence
- **Minimum Levels of Learning** (1991) given emphasis on levels of achievement at various stages and revised textbooks.
- **National Programme for Nutritional Support to Primary Education** (1995) provided a cooked meal every day for children in Classes 1–5 of all government, government-aided and local body schools.
- **District Primary Education Programme (DPEP) (1993)** focused decentralized planning and management, improved teaching and learning materials, and school effectiveness.
- **Movement to Educate All (2000)** pointed to achieve universal primary education by 2010 through microplanning and school-mapping exercises, bridging gender and social gaps.
- **Fundamental Right (2001)** included the provision of free and necessary education, declared to be a basic right for children aged between 6 and 14 years.

Objectives of Study:

- To study vision of NEP.
- To describe the challenges of NEP.
- To understand the changes of NEP.

Highlights of New Education Policy:

The National Education Policy imparts equal right to education. It integrates school education as an elementary part and makes it required for every child. There is provisions of multiple entry and exits for secondary students and encompasses to Undergraduate, Post Graduate and research levels. It permits the flexibility for a student to complete his education at any point of time the student thinks so and has mainly been outlined for students who had to discontinue their studies midway due to any reason. The main purpose of this policy is to provide a strong base of liberal arts along with Vocational Training at Undergraduate levels. A candidate who is in the fourth year of the Undergraduate course can seamlessly integrate itself at Masters and Doctoral levels which in the long run will help in bringing professional education into mainstream undergraduate education. Vocational Education will also be an important part of the Education Policy.

The Higher Education sector has been united with liberal arts with Mathematics, Sciences, Technology and Engineering. The main aim of this is to advance updated critical thinking, higher-order thinking, having more grip on the subjects and domain, to develop problem-solving skills along with teamwork and communication skills. The postgraduate and the doctorate levels have been given the options of one year, two-year and five-year degree. The post-graduation will have more research level concepts and will have for professional competence. The National Research Foundation has been created whose main aim would be to highlight of the Education System mainly at College and University levels. It will also take care of research capacity development and monitoring the same with a more formal mechanism.

- In Higher Education there is a multiple entry and exist policy.



- M.Phil courses to be discontinued.
- Bachelor Degree period is decided of 3 to 4 year. After 1 year student can get Certification, after 2-year student can get Diploma, after 3-year student can get Degree and after 4 years period student can get Bachelor with Research Degree.
- There is an arrangement of Academic Bank of Credit where credits are stored in this Bank and it can be easily transferred.
- E-learning is a main focus of this policy so as the dependency on books can be decreased.
- National Assessment Agency will conduct Common Entrance Exam.
- By the year 2030, Government is planning to establish at least one Higher institution.
- By the year 2040, it is proposed to make all higher institutions as multidisciplinary higher institutions.
- Indian Higher Education is classified in four vertical aspects viz. are National Higher Education Council, General Education Council, Higher Education Council and National Accreditation Council.
- Rules and regulations are same for private and public institutions in the same way for differently able people there will be some changes.

Controversial Side of NEP:

This NEP comes with lots of new changes. For this purpose, huge financial support is required. It's just depends on assumptions. As India is famous for its diversity and plurality but unfortunately this policy avoids it. Hence it will be disastrous. India is well-known for its socio-economic structure which is also the strength of it. New Education policy promotes the path of Centralization which may be harmful for the growth and development of India. Higher education should be multidisciplinary and interdisciplinary. But the process of centralisation that this policy envisages will focus to a severe stranglehold on academic freedom and liberation.

In Higher Education following problems will be taken place:

- This policy classified teachers into two categories. On one side some teachers will do research activities and remaining on teaching. How can teaching field enhance without research? This is also a big question.
- This NEP also promotes to privatisation where foreign universities can also run their courses. It creates unnecessary competition.
- Most important thing, this NEP has given emphasis on much more to Indian Culture and knowledge, What's about the knowledge of other globe.
- Yoga is mentioned to be a part of Liberal Arts education. Along with Yoga, institutions and students should have the choice to pick other similar systems as well.
- Doctoral students are to learn an Indian language. It will become an obstacle as focus should be on study of topic and research.
- What are the fields of national importance? This is a major flaw in this policy statement. No government should be given the authority to adopt on what the topics of research should be. It is always ignorance that leads to conflicts. Efforts should be made to study and understand every phenomenon that manifests themselves around us. Academic liberty should not be negotiated at any level.
- For undergraduate programmes, admission to public higher education colleges will be through an assessment. Then what about private ones? Will they conduct separate tests? The policy envisages a deeply divided society, divided by access to education at all levels, which cannot happen.
- A major loophole in the NEP 2020's report is its utter disregard for gender and related issues in the higher education segment. Neither is there any mention of the disabled community nor of the socially underprivileged classes. Is higher education expected to cater to the hegemonic classes alone?
- For teachers, the probation period can be of five years, or more, or less, thus giving freedom to the colleges to decide on the process of confirming period, which can be detrimental to the academic



freedom of the teachers. This is problematic since regulatory authorities will have no role in matters related to this. How can we ensure a free and fair environment for the faculty members to perform well?

Conclusions:

The most important element of this Education Policy is Digital literacy and Computational thinking. The importance would be given to make students digitally literate and also will be trained in programming and coding to enhance their IT skills. NEP has been praised to integrate ICT in education so that the process becomes less cumbersome, fast and crystal clear. ICT will enable the students to have a better education through proper monitoring. NEP has also planned to collaborate virtual education into the education process so that the students can maximize their educational experience. The policy talks about the inclusion of disruptive technologies into the system. It will include Artificial Intelligence, Cognitive tools to ensure that online education is directed by student learning and student growth at an individual level. It plans for enormous IT infrastructure and technology platforms. It proposes to have more and more online courses and expects to have tie-ups with top-level Universities and Institutes to have more Massive Open Online Courses (MOOC's).

But, the big challenge of this policy is implementation. In India, there are many states as well as their education system is also different. Then the questions arise of uniformity. But with the help of mutual understanding and proper communication policy may be solve this challenge and then only it can be implemented in India.

References:

1. Ministry of HRD, National Policy on Education 2016, Report of the Committee for the Evolution of the New Education Policy, 2016.
2. NCERT, Department of Educational Surveys & Data Processing, Manual on Statistics and Indicators of School Education, March 2006.
3. The Right of Children to Free and Compulsory Education Act, 2009.
4. <https://physicscatalyst.com/graduation/kothari-commission/>
5. https://www.academia.edu/38752291/Role_of_Nehru_in_Advancement_in_Education_in_India_after_Independence
6. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
7. <https://ruralindiaonline.org/en/library/resource/national-education-policy-2020>

Impact Factor -(SJIF) –8.572
ISSN - 2278 -9308

FEBRUARY 2022
ISSUE NO. (CCCXXXVII) 337

B.Aadhar

Peer - Reviewed & Refereed Indexed

MULTIDISCIPLINARY INTERNATIONAL RESEARCH JOURNAL

International Interdisciplinary Virtual Conference on

INNOVATIONS AND CHALLENGES

IN COMMERCE, HUMANITIES, SCIENCE AND TECHNOLOGY

ICCHST-2022



Editors

Dr. Archana P. Khandelwal

Dr. Jagdish M. Saboo



This Journal is Indexed in
Scientific Journal Impact Factor (SJIF)
Cosmos Impact Factor (CIF)
International Impact Factor Services (IIFS)



For Details Visit to : www.aadharsocial.com

Aadhar PUBLICATIONS



Impact Factor – 7.675

ISSN – 2278-9308

B.Aadhar

Peer-Reviewed & Refereed Indexed
Multidisciplinary International Research Journal

February, 2022

ISSUE No- (CCCXXXVII) 337-B

ICCHST-2022

Prof. Virag.S.Gawande

Chief Editor

Director

Aadhar Social Research &, Development Training Institute, Amravati.

Editor

Dr.Archana P. Khandelwal

Dr.Jagdish M. Ssboo

SHANKARLAL KHANDELWAL ARTS, SCIENCE AND COMMERCE COLLEGE,
AKOLA (MS)

Aadhar International Publication

For Details Visit To : www.aadharsocial.com

© All rights reserved with the authors & publisher



Principal's Message,

It is a matter of great delight for me that our college has organized this International Interdisciplinary conference on "Innovations and Challenges in Commerce, Humanities, Science and Technology". I would like to extend a warm welcome to all the resource persons, keynote speakers, researchers, and delegates.

In 1999, a momentous step in the golden journey of our parent society, Shikshan Prasarak Mandal was the establishment of a senior college in the form of Shankarlal Khandelwal College of Arts, Science, and Commerce. Our college has 11 research centers, 19 supervisors, and 32 students pursuing Ph.D. across various domains. To date, 21 Minor Research Projects and 2 Major research projects have been submitted. In addition, 19 National conferences and 3 International conferences, various career-oriented courses, add-on courses, and a certificate course on Swami Vivekananda philosophy are conducted in college, providing means for the all-inclusive development of our students and staff.

The theme of the present conference is self-explanatory. The conference aims to discuss the Innovations, Challenges and opportunities available across market spaces such as equity market, crypto currencies, cause and effects of different technologies on global markets, investments and commerce. Thus, I feel that the conference will focus on the present need of time and prove very useful for the stakeholders.

The present conference is just the next step towards our mission. I wish grand success to it. I am sure that it will open many new avenues and instill knowledge, skills, and research attitude among students, faculty members, and researchers across all the disciplines.

I express my deep-felt gratitude to the collaborators- Vidharbha Chamber of Commerce and Industries, Knowledge partner- Khandelwal Total solutions (Pvt.) Ltd., our parent society- Shikshan Prasarak Mandal, Akola, and the others.

I would like to communicate my acknowledgments towards my entire teaching and non-teaching staff for turning this event into a success.

Dr.J.M. Saboo



Editorial

It is an honour and privilege for me for being given an opportunity as Convenor to address the distinguished guests and the participants from various colleges in the International Interdisciplinary Virtual Conference on “Innovations and Challenges in Commerce, Humanities, Science and Technology” ICCHST-2022 on Wednesday 23rd Feb 2022.

The discussions and brainstorming articles in the Journal would truly contribute in improving knowledge bank. Since the announcement of publishing the Peer Reviewed & Indexed Research Journal with ISSN 2278-9308 with Impact Factor of 7.675(SJIF). We are thankful to all the authors who responded to our appeal. It is matter of pleasure for the editorial board to present this journal in the hands of the academicians.

I would like to mention special thanks to Honourable Dr.TaratieHatwalne , President of SPM, Honourable Gopal Khandelwal , Secretary of SPM, and other members of the parent society who always encourage us in conduction of various academic activities. Special thanks to Dr. J.M. Saboo Principal ShankarlalKhandeleal College for giving concrete to the abstract concepts.

I am thankful to the authors for sharing the knowledge in the form of research paper.

Shri. ViragGawande ,Aadhar Publishing House has helped us a lot in publishing the research paper in the form of an online journal.

I express my gratitude towards our collaborators Mr. NitinjiKhandelwal Chairman, Vidarbha Chamber of Commerce & Industries and Khandelwal Total Solutions Private Limited for associating with us and for continuous support and advice which have greatly helped towards the successful organisation of this international interdisciplinary virtual conference.

I also express my gratitude towards the International organizing committee which includes ,Dr. Justin Paul ,Editor-in-Chief Professor, University of Reading, England & University of Puerto Rico, USA

Mr. Raj A. Kapoor , Founder & Chairman of Block Chain Alliance

Dr. A. NarasimaVenkatesh , Professor and Head of Dept. HRM & General Management ISBR Business School

Dr. Vinod Khadkikar, Prof.& IEEE Fellow,EECS Department, Khalifa University, Abu Dhabi, UAE.

Dr.AkshayRathore, Prof.& IEEE Fellow, Singapore Institute of Technology, Singapore.

For making this event successful one.

I acknowledge my thanks towards local organizing committee :



Dr.MurlidharWadekar, Hon. Joint Director, Higher Education Amravati District, Amravati
Dr.G.W. Nichit, Dean Commerce Faculty, SGB Amravati University
Dr. S.B. Kadu, Chairman Board of Accounts & Statistics, SGB , Amravati University , Amravati.
Dr.VaishaliGudadhe Dean , Faculty of Interdisciplinary Studies , SGBAU, Amravati
Dr. Santosh Kute, Chairman, Dept. of Economics SGBU, Amravati
Dr. A. H. Harne, Chairman, Board of Commerce
Dr. D.N. Vyas , Chairman, Board of Economics
For making this event successful.

An event like this cannot happen overnight. The wheels start rolling weeks ago. It requires planning and a birds eye for details. We have been fortunate enough to be backed by a team of very motivated and dedicated colleagues.

I am grateful to all my colleagues for their teamwork and kind efforts whenever needed We also express my thanks to all supporters who are directly or indirectly involved in this mission.

I also thank the technical committee for their support and for making this online event a success. I acknowledge the unwavering support received from Head of Department of Commerce Dr. P.M. Pisolkar, faculty and staff members.

I also record my sincere thanks to our contributors who have co-operated directly and indirectly in all respect.



Editorial Board

Chief Editor -

Prof.Virag S.Gawande,

Director,

Aadhar Social Research & ,

Development Training Institute, Amravati. [M.S.] INDIA

Executive-Editors -

❖ **Dr.Dinesh W.Nichit** - Principal, Sant Gadge Maharaj Art's Comm,Sci Collage,

Walgaon.Dist. Amravati.

❖ **Dr.Sanjay J. Kothari** - Head, Deptt. of Economics, G.S.Tompe Arts Comm,Sci Collage

Chandur Bazar Dist. Amravati

Advisory Board -

❖ **Dr. Dhnyaneshwar Yawale** - Principal, Sarswati Kala Mahavidyalaya , Dahihanda, Tq-Akola.

❖ **Prof.Dr. Shabab Rizvi** ,Pillai's College of Arts, Comm. & Sci., New Panvel, Navi Mumbai

❖ **Dr. Udaysinh R. Manepatil** ,Smt. A. R. Patil Kanya Mahavidyalaya, Ichalkaranji,

❖ **Dr. Sou. Parvati Bhagwan Patil** , Principal, C.S. Shindure College Hupri, Dist Kolhapur

❖ **Dr.Usha Sinha** , Principal ,G.D.M. Mahavidyalay,Patna Magadh University.Bodhgay Bihar

Review Committee -

❖ **Dr. D. R. Panzade**, Assistant Pro. Yeshwantrao Chavan College, Sillod. Dist. Aurangabad (MS)

❖ **Dr.Suhas R.Patil** ,Principal ,Government College Of Education, Bhandara, Maharashtra

❖ **Dr. Kundan Ajabrao Alone** ,Ramkrushna Mahavidyalaya, Darapur Tal-Daryapur, Dist-Amravati.

❖ **DR. Gajanan P. Wader** Principal , Pillai College of Arts, Commerce & Science, Panvel

❖ **Dr. Bhagyashree A. Deshpande**, Professor Dr. P. D. College of Law, Amravati]

❖ **Dr. Sandip B. Kale**, Head, Dept. of Pol. Sci., Yeshwant Mahavidyalaya, Seloo, Dist. Wardha.

❖ **Dr. Hrushikesh Dalai** , Asstt. Professor K.K. Sanskrit University, Ramtek

Our Editors have reviewed paper with experts' committee, and they have checked the papers on their level best to stop furtive literature. Except it, the respective authors of the papers are responicible for originality of the papers and intensive thoughts in the papers.

- **Executive Editor**

Published by -

Prof.Virag Gawande

Aadhar Publication ,Aadhar Social Research & Development Training Institute, New Hanuman Nagar,

In Front Of Pathyapustak Mandal, Behind V.M.V. College,Amravati

(M.S) India _Pin- 444604 **Email :** aadharpublication@gmail.com

Website : www.aadharsocial.com **Mobile :** 9595560278 /

**INDEX -B**

No.	Title of the Paper	Authors' Name	Page No.
1	Changing aspects of cyber security using the implementation of Blockchain Technology	Aditya Khandelwal	1
2	Relationship between the Efficient Leadership Styles and Organizational Efficiency by inquiry Managing Director and Managers of Public Sector Organizations	Dr. Senthamil Raja Andi Selvam	5
3	Use of WINSIS as a tool for supporting Information Literacy Programme	Dr. Sachin G. Mahajan	15
4	Formulation of Research Problem	Dr. Sachin G. Mahajan	23
5	Covid-19 pandemic and employment generation in indian economy	Dr. Sandip Bhaskarrao Jagtap	26
6	A Study on Perspectives of Entrepreneurship Development	Dr. Rupa Z Gupta	29
7	Digital Marketing: A New Career Opportunity in India	Dr. Ramesh P. Deshmane	34
8	A conceptual study on tools and techniques to manage stress to ensure the work life balance.	Dr. Pallavi Mandaogade	39
9	Women Empowerment in Rural Areas – A Critical Study	Dr. Nilima Sarap (Lakhade)	44
10	“Blockchain Technology – A Conceptual Study”	Dr. Nilesh N. Chotiya	48
11	Cryptocurrency and Digital Assets.	Dr. Narendra Haribahu Shegokar	51
12	Impact of Covid-19 on the Indian Economy And Agriculture Sectors	Dr. J.M. Saboo / Dr. Monika Saboo	55
13	Understanding ‘Kaizen’ as a Powerful tool for Continuous Improvement	Dr. Mithila B Wakhare	59
14	Cyber Security Analysis Of Internet Banking In Emerging Countries	Dr. M. S. Gaikwad / Dr. J. D. Porey	62
15	Opportunities and Challenges in Commerce Higher Education in Indian Perspective	Dr. Lalchand D. Bodile	66
16	GST and Indian Economy	Prof. Dr. Jyoti R. Maheshwari	69
17	Trade in SAARC directions: an analytical study	Dr. Ghuge Sunil Balu	72
18	A Study on Bitcoin in Akola City	Dr. Devendra N. Vyas	77
19	The Contribution Of Information Technology In Accounting	Dr. Deepika Vishal Santoshwar	82
20	Forensic Accounting & Its Current Concerns	Dr. Deepak S. Jejani	87
21	Use Of Ict Tools And Free Technological E- Resources In Teaching Learning Process	Prof. Dr. Deepak D. Nilawar	91
22	Impact Of Covid-19 Pandemic On Indian Economy	Dr. Dnyaneshwar Vishnu Gore	95



Cyber Security Analysis Of Internet Banking In Emerging Countries

Dr. M. S. Gaikwad & Dr. J. D. Porey

Professor, G. S. Science, Arts & Commerce College, Khamgaon – 444303 District – Buldana.

Abstract

Internet banking has become one of the fastest and easiest ways of banking. The threat of cyber security attacks set a great challenge for the Internet banking and electronic commerce (E-commerce) industries. In this paper, we first analyze in detail the cyber security of Internet Banking in Emerging Countries and then propose a novel model to reduce the cyber security risk to bridge the gap between banks and customers. The proposed model is based on results of surveys conducted on Internet banking in three emerging countries (Saudi Arabia, Pakistan and India). The survey focused on users practices in Internet banking. The questions were based upon user's knowledge about cyber security and user's awareness of common threats in Internet Banking. The results obtained support the argument that there is an emerging gap between banks expectation and user actions related to Internet banking. The proposed model bridges the gap taking into account user's IT literacy and IT equipment (Hardware and Software) increasing the responsibility of banks to reduce the cyber security risks for users.

Introduction

Internet banking also known as electronic banking (E-banking), online banking and Virtual banking is widely promoted as a convenient banking solution. Internet banking has proved to be an ideal and profitable means of banking in the banking industry. Most banks have quickly migrated to this technology in order to reduce cost and improve customer experience.

[1] The process of adoption of technology depends on information gathering and set of belief that will help the user in either accepting or rejecting it

[2] The technology acceptance model or TAM determines that the user acceptance of technology is driven by two factors namely ease of using that technology and usefulness of the technology

[3] Adoption of technology is the greatest challenge for the banking industry. Some of the risk associated with the Internet banking users are users themselves; their behaviour when it comes to E-banking

[4] Internet banking security risk can cause financial losses if the risk is real. Financial sectors and banking sectors are more prone to security attacks

[5] User acceptance is one of the key factors in the acceptance of technology. To work on Internet banking requires a certain level of information technology literacy. Users may not be comfortable in trusting a totally automated system

[6] Despite the fact that banks in emerging countries have integrated security features yet users behavior causes security vulnerabilities.

A lot of internet security threats and vulnerabilities still continue to persist. An example is Internet banking users sharing their login credentials with others knowingly or unknowingly. As new threats continue to emerge, banks will need to adopt new measures to protect users. Banks can do more by deploying Information Security policies that ensure safer Internet banking experience. The Information Technology security policies could consist of items related to users and machine based learning or Artificial intelligence, which would learn users' pattern while conducting Internet banking. For example, the bank artificial intelligence could detect trusted devices like trusted laptop or mobile device, which the user use for his daily banking activities and if the user logged in from a different device, it will send a notification on the registered mobile number of the users. In this study a novel model is proposed which puts more responsibility on banks to avoid security breaches which are caused due to negligence or lack of awareness by the users.

The responses from the conducted survey highlighted two aspects regarding users:



1) User behaviour while conducting Internet banking and 2) User awareness on threats relates to Internet banking. Some of the negative response are related to lack of awareness of users on threats related to Internet banking. It would be difficult for users to cope with the changing technologies and threats. So the logical solution could be that banks could control the process by imposing information technology policies that can help bridge the gap that lead to a safer E-banking environment and reduce the possibility of security breaches. They can use behavioural study or model that are based on Artificial Intelligence or Machine based Learning that could provide early-detection of negligence of users or target those domains which could lead to a security breach on Internet banking.

A population sample of 476 random customers' responses were analysed. In the dimension of study, factor analysis-varimax rotation was used and simple regression was used to see the influence on perceived privacy and security, ease of use, quality of service and customer feedback on Internet banking. All the factors chosen for the study were independent but the factor that have the most impact in influencing the customer trust was the quality of service provided on the website. The acceptance of the Internet banking was found in the audience that had high education level and good amount of computer literacy.

Research Methodology

In this study, the research methodology is designed by selecting 3 emerging countries namely Saudi Arabia, India and Pakistan. A survey was designed with questionnaire divided into two parts; the general practice of users on the Internet banking and awareness of the threats related to Internet banking. Based on the survey's positive and negative responses, a model is proposed that can bridge the gap between banks expectation and user behavioural response when it comes to Internet banking. To support the argument about the importance of internet banking, detailed analysis about the total internet users against the total population of each selected country.

User Practices for Internet Banking Some of the practice that a user is expected to follow while in the Internet banking environment: 1. Maintaining up to date operating system on personal computers that can protect the user from malware. Downloading software from 3rd party is a common practice by users. Most of the users are unaware of the malicious code that are hidden in the software. 2. Using browser with less vulnerabilities. Browsers are the most likely item targeted by cyber attackers. Users can get compromised if they are not updating their browser. 3. Password management: Choosing a complex password which include a combination of capital, small letters, numbers and special character. This can make the password difficult to guess and avoid unauthorized access. 4. Reading banking agreement. As per our survey it highlights that users do not read the online banking agreement which highlights the user's responsibilities and a point where banks would like to educate users about the sensitive nature of Internet banking. The online banking agreement consists of information of protecting your password, credit cards and pin number.

Proposed Security model required to decrease the security risks in Internet banking. Banks should use the concept of trusted device to ensure the identity of the users while the user is logging on. If the user has logged in from an entrusted device the bank system should send an SMS alert to confirm if it was the intended user. Education of the users is a key component to ensure safe Internet banking experience. The bank can provide security warning on their WebPages after the user has successfully logged in to familiarize users on the threats that are risk for Internet banking. Banks should use Artificial intelligence software or machine based learning software that can make judgments on the user behavior example transferring large amount of cash to a destination not within the monthly pattern of the user. This software can be used to detect all electronic transactions including credit card transaction and will be able to detect if the user has made a purchase not within the customer's pattern and will alert and sometimes disable the credit card or E-banking account in extreme cases until the customer's identity is verified. The machine based learning or artificial intelligence should predict this anomaly and take appropriate action. Information security is a critical part of the Internet banking process. Therefore,



banks can improve the security features from their side by securing their servers and the communication between the user and Internet banking server. Table 4 describes the list of security features that each bank should incorporate to ensure the security of user's data and communication. User should change password every 3 months. Use virtual keyboard to enter password rather than keyboard to avoid malicious code like key logger. Use trusted device and avoid using public network for e banking Educate the user of online threat by posting a warning message after user successfully login. User should follow the security practices enlisted on the banking website Bank1. Banks should force user to change password.2. Enforce complex password.3. No repetition of previous 2 passwords. Bank enforcing users to use virtual key board by disabling keyboard login.Bank should send a sms notification/email if a login was detected from an untrusted device similar to google policy Banks should send sms tips for safe Internet-Banking experience Banks should do more to enforce security practices by using AI or machine based learning to detect any unusual behaviour of Internet-Banking user

Security Features of the Internet banking proposed model Description

1. SSL Certificate Secure Socket Layer (SSL) certificate need to be installed for E-banking website and other substitute websites representing banks.
2. Device Registration User access devices (laptops, smart phones, tablets etc.) will be registered and after verification, only that device will be able to access E-banking systems.
3. System based Alarms Setup of different Server based alarms to monitor and control the bank transactions and access of the user accounts etc.
4. Group Policies Settings Group policies are being applied to make sure that specific users have minimum required access of the internet banking system resources.
5. MFA Multifactor Authentication (MFA) methods are used to access the Internet banking administration console to make the infrastructure more secure.
6. SNS Simple notifications is enabled to the Internet banking services to which will send mobile SMS and email notifications based on the enabled system based alarms.
7. Inbound / Outbound Rules Inbound / Outbound access rules are applied and only specific communication ports (e.g. HTTPS) are opened and rest of the ports are blocked.
8. Data Encryption - Encryption is enabled to all the stored data on server by using encryption tools (e.g. bit-locker).
9. Users Access Permissions - Based on the requirement, administration users need to be created and only minimum required access to the particular service is granted.
10. Private Key with Password - To make the internet banking infrastructure access more secure, private keys with passwords need to use.

Conclusion

The Internet banking service is offered by banks to provide convenience for their customers; however, there are great benefits to banks as well. The most important benefit to banks is the reduction in operational cost is incorporating many services on their online portal. Therefore, the banks should take more responsibility in ensuring a more secure Internet banking environment for their customers. In this paper, we proposed a model that incorporates more responsibility on banks to ensure that the Information Technology policies are adhered by customers. For example, rather than informing customers that it is good practice to change password every 3-6 months, the banks should force customers to change their passwords every three months through expiring their passwords so that customers are forced to change their password. The Banks should also integrate the latest Information Security Technologies to ensure that the communication is secure between bank and customers. The proposed model would provide a more secure Internet banking environment which would be of mutual interest to both banks and customers. Also the technologies proposed in this model are existing technologies and need not be invented nor developed from scratch. For example, the trusted device concept is an available technology and already in use by non-banking industries. Google already uses trusted devices in their Gmail



application. Also there are many existing algorithms for Artificial Intelligence (AI) supervised and unsupervised learning that could be integrated to learn customer's behaviors and detect anomalies.

References

- [1] Xue, M., Hitt, L.M. and Chen, P.Y., 2011. Determinants and outcomes of internet banking adoption. *Management science*, 57(2), pp. 291-307.
- [2] Akhlaq, M.A., 2011. Internet banking in Pakistan: finding complexities. *Journal of internet banking and commerce*, 16(1), p.1.
- [3] Cheung, R. and Vogel, D., 2013. Predicting user acceptance of collaborative technologies: An extension of the technology acceptance model for e-learning. *Computers & Education*, 63, pp.160-175.
- [4] Martins, C., Oliveira, T. and Popovič, A., 2014. Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. *International Journal of Information Management*, 34(1), pp.1-13.
- [5] Ivan, I., Ciurea, C., Doinea, M. and Avramiea, A., 2012. Collaborative Management of Risks and Complexity in Banking Systems. *Informatica Economica*, 16(2), pp.128-141.
- [6] Gharaibeh, N., 2013. The impact of customer knowledge on the security of E-banking. *International Journal of Computer Science and Security (IJCSS)*, 7(2), p.81.
- [7] Council, F.F.I.E., 2005. Authentication in an internet banking environment. *Financial Institution Letter*, FIL-103-2005. Washington, DC: Federal Deposit Insurance Corp.(FDIC). Retrieved March, 18, p.2005.
- [8] Chen, C.J., 2016, July. User Adoption Decisions in Self-Service Technologies: A Study of the Internet Banking. In *Advanced Applied Informatics (IIAI-AAI)*, 2016 5th IIAI International Congress on (pp. 1207-1208). IEEE.

Impact Factor-8.575 (SJIF)

ISSN-2278-9308

B.Aadhar

Peer-Reviewed & Refreed Indexed

Multidisciplinary International Research Journal

February -2022

(CCCXXXVIII) 338



Chief Editor

Prof. Virag S. Gawande

Director

Aadhar Social

Research & Development
Training Institute Amravati

Editor:

Dr.Dinesh W.Nichit

Principal

Sant Gadge Maharaj
Art's Comm,Sci Collage,
Walgaon.Dist. Amravati.

Executive Editor:

Dr.Sanjay J. Kothari

Head, Deptt. of Economics,
G.S.Tompe Arts Comm,Sci Collage
Chandur Bazar Dist. Amravati



This Journal is indexed in :

- Scientific Journal Impact Factor (SJIF)
- Cosmos Impact Factor (CIF)
- International Impact Factor Services (IIFS)

For Details Visit-To : www.aadharsocial.com

Aadhar PUBLICATIONS



INDEX

No.	Title of the Paper	Authors' Name	Page No.
1	Christianity In India: The Early Period And Vasco Da Gama	Anjali Andrey	1
2	The Facets Of Constitutionalism And Present Political Scenario In India: An Analysis	Dr.K B Chaurpagar	5
3	A brief study of historical review of Indian Ethics	Dr. (Mrs.) Seema Deshpande	8
4	Role of ICT in Management Education - Enhancing Quality of Education and A Better Conduit of Learning	Dr. Anita Sable	11
5	The Growing Interoperable Dimensions in Knowledge Society	Dr. Dhananjay W. Deote / Dr. Pramod A. Wadate	21
6	Buying behaviour of students towards toothpaste: A study on western vidarbha	Dr. M. S. Galkwad & Miss. Shraddha D. Rathi	30
7	Silence! The Court is in Session: An Exhibition of Marxism	Dr. Manohar A. Wasnik	35
8	Factors Affecting Higher Education Of Minority Students	Dr. Najma Begum/ Asma	38
9	Bitcoin And Cryptocurrency : Challenges And Opportunities	Dr. Patil Bhagwan Shankar	42
10	The Process of Entrepreneurship	Dr. Rajesh M. Deshmukh	48
11	Effect of Pranayama and Suryanamaskar on Lung Capacity of College Students	Dr. Sanjay V. Deshmukh	51
12	Agricultural Marketing Impact of Covid-19	Dr. Suresh G. Sonawane	54
13	Women Empowerment for Nation's Development	Dr. Tanka Prasad Upadhyaya	58
14	Feminism in English literature: An overview	Dr.Dadarao.K.Upase	63
15	South Travancore Before The Emergence Of Venad	Dr.Sajeey Singh.M.K.	66
16	An overview of Mobilization of resources and its transition towards development of Indianeconomy	Dr.V.A.Pawale / Mr. Narendra Balbhim Mudiraj	70
17	Digital Libraries: An Overview	Jagadish T Patange	73
18	Title:Challenges Before Indian Democracy	Dr. More Nayanath Bhagawan	76
19	Cryptocurrency : Impact On Indian Economy	Dr. Sou. Parvati Bhagwan Patil	79
20	The Importance Of Computers In Research	Prof. Rajesh B. Tandekar	85
21	Impact of E-commerce on Textile industry	Kashish Sandeep Mehra	89
22	India China Border Issues(Dispute)	Dr.Prashant Diwakar Satpute	93



Buying behaviour of students towards toothpaste:

A study on western vidarbha

Dr. M. S. Gaikwad & Miss. Shraddha D. Rathi

Department of Commerce, G. S. Science, Arts & Commerce College,
Khamgaon ,District - Buldana

Abstract

Toothpaste industry is a big market in India. Toothpastes form an important item in the monthly grocery shopping of most of the urban households. In earlier times, consumers especially in India relied on using the traditional substances like Neem twigs or Mishri (Tobacco containing teeth cleaning powder) for keeping their teeth clean and healthy. But slowly international brands started replacing the older methods of maintaining oral hygiene. Earlier consumers were negligent of their oral hygiene and even didn't care to see a dentist for their oral health problems. However, the trend is changing and now a day's dental advice is also considered an important factor while making a purchase decision of the toothpaste brand, at least in urban markets. Today's consumer has a wide variety of choice in terms of tooth paste brands. Toothpastes from paste form, to gel and powder form are present in the market catering to needs of all the segments.

Also, a lot of herbal and medicated toothpastes having natural and anti-sensitivity properties are creating niches for themselves in the market space. This descriptive study mainly focuses on understanding the external factors like demographic, social, product attributes and other external influencers which impact consumer decision making process for buying toothpaste. The method adopted for conducting survey is questionnaire; using non probability convenience sampling technique for gathering information from consumers.

Keywords: Toothpaste, Neem, Consumers, Oral, Purchase, Niches, Demographic

Introduction:

Marketers had long back noted that consumer did not always act or react, as marketing theory would suggest. Consumer behaviour emerged as a stream of management which dealt with the way a consumer goes about making a decision to purchase various products. Selection of an action from two or more alternative choices is termed as a decision. "Consumer purchase decision" involves decision to purchase the goods from the available alternative choice. The various available options to the consumer can be classified into five main types of decisions. They are what to buy, how much to buy, where to buy, when to buy, how to buy. The people who impact the buying decisions may be classified as the initiator, influencer, decider, buyer and users. The size of the consumer market in the country was vast and constantly expanding with 27 millions of dollars being spent on goods and services by millions of people. Consumer preferences are changing and becoming highly diversified. The needs of the consumer which have to be fulfilled, the alternatives existing, the product and brand choices they have and the post buying behaviour of the consumers need to be studied for an effective marketing strategy. The Indian Fast Moving Consumer Goods (FMCG) industry began to shape during the last fifty odd years. The FMCG sector is a cornerstone of the Indian economy. This sector touches every aspect of human life. Indian FMCG market has been divided for a long time between the organized sector and the unorganized sector. Unlike the US market for FMCG which is dominated by a handful of global players, India's Rs. 460 billion FMCG market remains highly fragmented with roughly half the market going to unbranded, unpackaged home-made products. This presents a tremendous opportunity for makers of branded products who can convert consumers to buy branded



products. Toothpaste forms a regular item in the grocery shopping list for monthly or bi-monthly purchases; the price forms an important factor. A lot of options are available to the consumers today in terms of the toothpastes brands ranging from different variants of Colgate which is designed to cater to the needs of all the segments from youths to the older generation, Pepsident, Close-up which comes in a gel form used by youngsters to give a long lasting freshness, Anchor which claims itself to be the 1 vegetarian toothpaste, Dabur, which comes in a powder form Sensodyne and other fluoridated toothpastes which are basically used for anti-sensitivity purposes. Urban India is, in itself, on the way to becoming a major world market. Many companies are focusing their activities in India specifically on urban areas because of the greater accessibility of those markets. Thus, urban consumption growth rather than overall growth is, for many companies, the most significant measure of the future Indian consumer opportunity.

According to McKinsey report of 2007, it is expected that urban consumption would accelerate and continue to grow faster than the overall economy, and forecast a compound annual growth of 9.4 percent over the next 20 years. If incomes follow this growth path, then average annual spending per urban Indian household will more than triple from 115,620 Indian rupees annually today to 378,170 Indian rupees in 2025. As household spending rises, the urban market will expand from 7,208 billion Indian rupees (\$158 billion) to 43,120 billion Indian rupees (\$944 billion) by 2025. At that point, the urban Indian market will exceed the size of France's total consumer market today. Apart from dramatic income growth, one of the main drivers of the rising urban market is the rapid growth in urban population. Nearly two-thirds of the total increase in population in India over the next two decades will occur in urban India. In addition, continued internal migration into urban areas will mean that the share of the country's population in urban areas will rise from 29 percent today to 37 percent in 2025. The combination of births and migration will raise the urban population from 318 million today to 523 million by 2025. Urban India today is already more populous than the entire United States; by 2025, it will exceed the current population of the EU. Rich urban households in India will have spending habits similar to those of their developed-country counterparts—branded apparel, vacations abroad, electronics, and cars will all be high-priority purchases. Finally, another attractive aspect of this target segment will be its geographical concentration. Today 60 percent of urban global households live in the top eight cities of the country (Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad, Ahmadabad and Pune), making them a relatively more visible and easily targeted segment than the other income bands. Consumers in India are set to drive growth, thanks to rising awareness of the importance of oral hygiene and improving income levels. Consumers are switching from traditional, homemade solutions such as datum, mishri and neem leaves to using toothbrushes and toothpaste.

Objectives:

- a) To study the factors that influences the buyers to buy different toothpaste(s).
- b) To examine the brand awareness for various brands and the attributes and influencers impacting purchase decision.
- c) To study the impact of consumer promotions and factors influencing switching behaviour.

Literature review:

Consumer Personality Factors There is two factors mainly influencing the consumers for decision making: Risk aversion and innovativeness. Risk aversion is a measure of how much consumers need to be certain and sure of what they are purchasing (Donthu and Gilliland, 1996). Highly risk adverse consumers need to be very certain about what they are buying. Whereas less risk adverse consumers can tolerate some risk and uncertainty in their purchases. The second variable, innovativeness, is a global measure which captures the degree to which consumers are willing to



toothpaste to consumers. Celebrity endorsement was the most impactful mode of attracting consumers to buy or try a toothpaste brand. Advertisement, sales promotion and recommendations of professional bodies are other marketing elements which impact toothpaste buying. Pricing in spite of being an important marketing mix, is not a major selection criterion in western vidarbha.

The data was meant for capturing information on switching behaviour and reasons for change of existing brand. Promotional offers and retailer influence was the main reason for switching behaviour seen for change in toothpaste brand. Advertisement and vegetarian toothpaste was other reasons for change in brands. Price rise, switching brands occasionally and short supply were the least preferred reasons for change of brands.

Limitations of Study:

The limitation contained in the primary data was that of limited sample size used for study, thus sample cannot be correct representation of the target. Moreover, consumer buying is a complex process in which number of factors like economic factors, social status and psychographic factors influence the buying of the consumer, those are not considered for the study.

Conclusion:

It is very difficult to predict consumer behaviour. Consumer research can to some extent solve this problem. Normally, companies concentrate on only analysing the requirements of consumers and also strategies to retain them. This study was conducted to understand behaviour and motives of consumers in India for buying toothpaste. There is a huge potential for Oral care market in India as penetration and per capita consumption of oral care product is very low. With rising per capita income and better awareness there is an increasing demand seen for oral care products. Many people in India still clean their teeth with traditional products like Neem twigs, salt, ash, tobacco or other traditional substances. The average all India per capita consumption of toothpaste stands at dismal 82gms. The dentist to population ratio is an abysmally low at 1:35000 in the country. All this has contributed to low oral hygiene consciousness and widespread dental diseases. Less than 15% of the Indian toothpaste users brush twice a day. Government of India has taken initiatives like conducting dental health camps for promoting the product consumption and creating awareness among common people on benefits of maintaining oral hygiene.

Therefore, companies need to analyse all these factors and find out the best suitable tools and cultural orientations for promoting their toothpaste brands in India. After economic liberalization of 1990s, Indian markets have borne witness to dramatic shifts in the structures triggered by sharp changes in the lifestyle patterns impacted by technology. Time tested concepts like mass marketing and brand loyalty, are being tested as they fail to gauge the behaviour of new generation customers. The behaviour has been characterized by the uniqueness of individual expectations, preference for multiple options, increasing propensity to abandon loyalty and switch to competitive brands that have higher (perceived) value. The new generation consumers don't mind buying imported products that can satisfy their specific requirement. In such a scenario, it has become difficult to classify the consumers by conventional demographic factors. On the other hand, unless their thinking process and buying behaviour are fully understood, decisions on packaging and product designs, branding and distribution channels are likely to be misplaced.

Bibliography Journals and Books:

1. Assunção, J.L., and Meyer, J.R., (1993): The Rational Effect of Price Promotions on sales and Consumption, *Management Science*, 39(5): 517-535.
2. Bawa, K., and Shoemaker. (1987): The Coupon-Prone Consumer: Some Findings Based on Purchase Behaviour across Product Classes, *Journal of Marketing*, 51(4), 99-110. Bell,

B.Aadhar' International Peer-Reviewed Indexed Research Journal



Impact Factor -(SJIF) -3.575, Issue NO, 338 (CCXXXVIII)

3. D.R., Chiang, J., and Padmanabhan, D. (1999): The Decomposition of Promotion and Marketing Science, 18 (4): 504-526.
4. Behura, KC and Panda, JK, (2012): VSRD International Journal of Business Management research, vol2 (2):65-74.
5. Daly, and Ellen. (1993): Advertising impact: Using the power of promotional gifts, The American Salesman, 38 (10):16.

100%
2024
B.Aadhar
2022

ISSN 2277 - 5730
AN INTERNATIONAL MULTIDISCIPLINARY
QUARTERLY RESEARCH JOURNAL

AJANTA

Volume - XI

Issue - II

April - June - 2022

ENGLISH / MARATHI PART - I

Peer Reviewed Refereed
and UGC Listed Journal

Journal No. 40776



ज्ञान-विद्या विभूतये

IMPACT FACTOR / INDEXING

2020 - 6.306

www.sjifactor.com

❖ EDITOR ❖

Asst. Prof. Vinay Shankarrao Hatole

M.Sc (Maths), M.B.A. (Mktg.), M.B.A. (H.R.),
M.Drama (Acting), M.Drama (Prod. & Dir.), M.Ed.

❖ PUBLISHED BY ❖



Ajanta Prakashan

Aurangabad. (M.S.)

The information and views expressed and the research content published in this journal, the sole responsibility lies entirely with the author(s) and does not reflect the official opinion of the Editorial Board, Advisory Committee and the Editor in Chief of the Journal “AJANTA”.
Owner, printer & publisher Vinay S. Hatole has printed this journal at Ajanta Computer and Printers, Jaisingpura, University Gate, Aurangabad, also Published the same at Aurangabad.

Printed by

Ajanta Computer, Near University Gate, Jaisingpura, Aurangabad. (M.S.)

Printed by

Ajanta Computer, Near University Gate, Jaisingpura, Aurangabad. (M.S.)

Cell No. : 9579260877, 9822620877, Ph. No. : (0240) 2400877

E-mail : ajanta6060@gmail.com, www.ajantaprakashan.com

AJANTA - ISSN 2277 - 5730 - Impact Factor - 6.306 (www.sjifactor.com)



EDITORIAL BOARD

**Professor Kaiser Haq**

Dept. of English, University of Dhaka,
Dhaka 1000, Bangladesh.

Roderick McCulloch

University of the Sunshine Coast,
Locked Bag 4, Maroochydore DC,
Queensland, 4558 Australia.

Dr. Ashaf Fetoh Eata

College of Art's and Science
Salman Bin Abdul Aziz University, KAS

Dr. Nicholas Loannides

Senior Lecturer & Cisco Networking Academy Instructor,
Faculty of Computing, North Campus,
London Metropolitan University, 166-220 Holloway Road,
London, N7 8DB, UK.

Muhammad Mezbah-ul-Islam

Ph.D. (NEHU, India) Assot. Prof. Dept. of
Information Science and Library Management
University of Dhaka, Dhaka - 1000, Bangladesh.

Dr. Meenu Maheshwari

Assit. Prof. & Former Head Dept.
of Commerce & Management
University of Kota, Kota.

Dr. S. Sampath

Prof. of Statistics University of Madras
Chennai 600005.

Dr. D. H. Malini Srinivasa Rao

M.B.A., Ph.D., FDP (IIMA)
Assit. Prof. Dept. of Management
Pondicherry University
Karaikal - 609605.

Dr. S. K. Omanwar

Professor and Head, Physics,
Sat Gadge Baba Amravati
University, Amravati.

Dr. Rana Pratap Singh

Professor & Dean, School for Environmental
Sciences, Dr. Babasaheb Bhimrao Ambedkar
University Raebareilly Road, Lucknow.

Dr. Shekhar Gungurwar

Hindi Dept. Vasant Rao Naik
Mahavidyalaya Vasarni, Nanded.

Memon Sohel Md Yusuf

Dept. of Commerece, Nirzwa College
of Technology, Nizwa Oman.

Dr. S. Karunanidhi

Professor & Head,
Dept. of Psychology,
University of Madras.

Prof. Joyanta Borbora

Head Dept. of Sociology,
University, Dibrugarh.

Dr. Walmik Sarwade

HOD Dept. of Commerce
Dr. Babasaheb Ambedkar Marathwada
University, Aurangabad.

Dr. Manoj Dixit

Professor and Head,
Department of Public Administration Director,
Institute of Tourism Studies,
Lucknow University, Lucknow.

Prof. P. T. Srinivasan

Professor and Head,
Dept. of Management Studies,
University of Madras, Chennai.

Dr. P. Vitthal

School of Language and Literature
Marathi Dept. Swami Ramanand
Teerth Marathwada University, Nanded.

 **EDITORIAL BOARD** 

Dr. Jagdish R. Baheti

H.O.D. S. N. J. B. College of Pharmacy,
Memnagar, A/P. Tal Chandwad, Dist. Nashik.

Dr. Sadique Razaque

Univ. Department of Psychology,
Vinoba Bhave University,
Hazaribagh, Jharkhand.

Prof. Ram Nandan Singh

Dept. of Buddhist Studies University of Jammu.

Dr. Safiqur Rahman

Assistant Professor, Dept. of Geography,
Guwahati College Bamunimaidam, Guwahati,
Assam.



PUBLISHED BY



Ajanta Prakashan

Aurangabad. (M.S.)



 **CONTENTS OF ENGLISH PART - I** 

S. No.	Title & Author	Page No.
1	Minority Discourse in Nissim Ezekiel's Verses Dr. Vinodkumar Pralhadrao Chaudhari	1-5
2	A Study of Brand Preference towards Toothpaste of College Students in Western Vidarbha Dr. M. S. Gaikwad Miss. Shraddha D. Rathi	6-12
3	Condition of Women at Workplace and Sexual Harassment Ms. Neeru Redhu Dr. Anil Kumar	13-18

 **CONTENTS OF MARATHI PART - I** 

अ. क्र.	लेख आणि लेखकाचे नाव	पृष्ठ क्र.
१	गांधीवादी स्वातंत्र्यसेनानी प्रेमाताई कंटक प्रा. डॉ. के. आर. गावडे	१-६

2. A Study of Brand Preference towards Toothpaste of College Students in Western Vidarbha

Dr. M. S. Gaikwad

Miss. Shraddha D. Rathi

Department of Commerce, G. S. Science, Arts & Commerce College,
Khamgaon, District - Buldana.

Abstract

Consumer is king—the statement carries profound truth in it. Today the success of any firm depends upon the satisfaction of college students. For satisfying the college students the firm should know about the behavior and preference of the college students. In these circumstances understanding consumer is a very difficult task because of the changing technology, innovation, and changes in life style. Respond to these changes, comprehensively and effectively. The study mainly focuses on understanding the Brand performance in toothpaste category and external factors like demographic, socioeconomic factors and other product attributes etc.

Keywords: Brand, Innovation, Technology, Toothpaste.

1.1 Introduction

Toothpastes are daily oral care products, the chemical composition of which is constantly changing due to manufacturer's competition. One of the fastest growing a segment in the FMCG sector has been the toothpaste segment. As per Euro monitor India, 'the toothpaste industry in India is over Rs.8000 crore in 2020. The main purpose of toothpastes is to clean and provide fluoride to protect the teeth from decay, and sensitivity, to whiten the teeth and prevent bad breath. Customer satisfaction refers to the extent to which customers are happy with the product and services provided by a business. Customer satisfaction is the ultimate goal of a marketer. A stiff competition arisen in the tooth paste industry. Customer level can be measured using survey techniques and questionnaires. Gaining high levels of customer satisfaction is very important to business because satisfied customers are most likely to be loyal and to make repeated orders and to use a wide range of services offered by a business. The wide selection of toothpastes and the various ingredients make it difficult for patients to choose the proper toothpaste and complicate the acquisition of dental products by professionals.

1.2 Statement of the Problem

The purchase of toothpaste is then to be viewed as a problem solving process. There has been a high proliferation of brands in the market. At the time of Purchase College students may get confused to select a particular brand to meet their needs. The process whereby individuals will decide whether, what, when, how, and from whom to purchase goods and services can be termed as the consumer's or the buyer behavior.

1.3 Objective of the Study

- To study the college Students brand preference about the toothpaste
- To identify the various factors that influences the purchase behavior.

1.4 Scope of the Study

- Toothpaste helps keep your teeth clean and healthy, gives you nice breath prevents against plaque, cavities, gum diseases keep teeth white and stronger.
- It attributes taste, health points, flavor and accorded priority.

1.5 Research Methodology

Methodology- There is two sources of data collection methods have been adopted for this study. One is Primary data and another is Secondary data. This study is basically relying on primary data by framing well- structured questionnaire to draw opinions or responses from respondents.

Analysis of Data

The primary data collected from students are analyzed by using various statistical tools in order to match results with the objectives of the study.

- Percentage analysis
- Chi square analysis

1.6 Limitations of the Study

- The study is limited only to a particular area i.e. Western Vidarbha and therefore, the findings of the study cannot be the same for other areas.
- All the findings and observations made in the study are drawn only on the information supplied by the respondents' which is based on their preference, ideas and hence there is a chance of bias.

2. Review of Literature

The basic purpose of the 'Review of Literature' is to acquire thorough and state of the art knowledge of the problem area so that the researcher can develop a comprehensive view. The review helps in finding the gaps in literature available and eventually facilitates formation of a

precise research problem. It is essential for a researcher to do review on the literature related to his present study, to have a deep knowledge on the subject. It is only through this literature that the researcher takes the initial step of fixing the problem of study. The review of literature has hitherto been a cumbersome exercise that requires continuous monitoring and concentration. A thorough review of literature will expose the researcher to previous researcher conducted and their area of study.

J Edwara Rusio and Eric. J. Johnson (2002) analyzed in the study on "What do college students know familiar product?" The researchers have sought to distinguish wise less knowledgeable consumer from more knowledgeable one by differentiating. The product comparison and judgment they are able to make people at the intermediate levels are most likely to seek out product information and use it because they have a framework of knowledge in which to place new information.

Shugan (2003) in his study on price, quality relationship exposed that price is an indicator of the quality. College students are encouraged to raise the quality of their product. He believes delivering a good quality of goods is the right image among end use of the product.

Nester et al, (2004) states that the best way to prevent the buildup of calculus is through twice daily brushing and flossing and regular cleaning. Visits based on the schedule recommended by the dental health care provider are also necessary. Calculus accumulates more easily in some individuals or students, requiring more frequent brushing and dental visit.

3. Profile of Toothpaste Industry in India

The toothpaste history in India can be tracked back from 1975 with 1200 tonnes of toothpaste produced by the toothpaste industry. Prior to the toothpastes Oral Hygiene was the domain of local homemade powders and ayurved practitioners. With the entry of Colgate in Indian marketplace the awareness about Oral care and the importance of oral care. In recent years the Industry has shown impressive growth rate of 18.6% (this growth is calculated in terms of value growth in Rs). The growth in the urban market has been largely by the Gel Segment. Presently, a large chunk of the Market is still held by Colgate. The major players in the toothpaste Industry being Colgate Palmolive and Hindustan Lever Limited and several minor players like Balsara hygiene, Dabur etc. Presently Colgate Dental Cream holds 52% of market share. HLL's Close up lies far behind with 23% of the existing market share. The third player in the marketplace in terms of market share is Colgate Gel with 10.5% of the market share. That leaves 14.5% market share for other Brands like Pepsodent, Pepsodent, Babool, Sensofam, Forhans, Cibaca, Neem etc. The toothpaste market is presently valued at Rs. 750 crores out of

which the Gel segment has already bagged 1/3rd portion of it. The Gel segment presently stands at Rs. 248 crores and is growing at a rate much faster than Cream. In India toothpaste usage as compared to other countries is very low which signifies about the potential of the market. In Urban India the usage of toothpaste per person per year is just 190gms.

Toothpaste Market-Growth, Trends, and Forecast (2020 - 2025)

Global Toothpaste market is segmented by Distribution (Supermarkets/Hypermarkets, Convenience Stores, Pharmacies and Drug Stores, Online, and Other Distribution Channels), and Geography. The global toothpaste market is projected to grow at a CAGR of 6.1% during the forecast period. Revenue in the Oral Care segment amounts to US\$1,787.3m in 2020. The market is expected to grow annually by 6.8% (CAGR 2020-2023). In global comparison, most revenue is generated in the United States (US\$9,148m in 2020). In relation to total population figures, per person revenues of US\$1.30 are generated in 2020.

Top 12 Most Popular Toothpaste Brands in India

1. Colgate: Colgate toothpaste brand owned by American Colgate Palmolive Company and one of the most trusted brands in India for oral hygiene products.
2. Close Up: Close-Up toothpaste brand is owned by Hindustan Unilever along with Pepsodent toothpaste and one of the top toothpaste brands in India terms of sales and position.
3. Pepsodent: Pepsodent is another famous American brand of toothpaste owned by Unilever and also among the India's most trusted brands
4. Patanjali Dant Kanti: Patanjali Dant Kanti Toothpaste is packed with herbal ingredients and known to improve oral health. Dant Kanti Advanced Toothpaste, Patanjali Dant Kanti Red and Dant Kanti Medicated are powerful toothpaste for tightens gums and tackles germs.
5. Meswak: It is a herbal toothpaste brand pure extract from the Miswak plant or Salvadore Persica tree from India. Miswak herbal toothpaste is best for healthy gums & strong teeth, owned by Dabur along with other toothpaste brands Babool and Promise
6. Dabur Red Paste: Dabur Red Paste is well known for healthy teeth and offers unique blend of traditional Indian medicine. Red is packed with Ayurvedic ingredients like Laung and Pudina.
7. Vicco Vajradanti: Vicco Vajradanti paste and tooth powder are perfect blend of Ayurvedic herbs, contains babhul, lavang and bakul. The natural paste of Vicco Vajradanti ayurvedic has medicinal ingredient for remedies for oral health.

8. Sensodyne: Sensodyne brand of toothpaste and Aquafresh toothpaste are owned by GlaxoSmithKline and one of the best sensitive toothpastes.
9. Amway Glister: Amway Glister toothpaste expensive but one of the most popular product for cleaner, whiter and healthier teeth. The American multi-level marketing company also has list of health and beauty brands.
10. Himalaya Herbals: It offers one of the best natural and safe products with Ayurveda. There are list of herbal toothpaste available from Himalaya Herbals for healthy brushing and power packed with Mint, Miswak, Cinnamon and Clove.
11. Lever Ayush: It is one of the personal care brand of Hindustan Unilever Company and into the business of natural soap, facewash, cream, hair oil and more range of products including toothpaste with Ayurveda such as Lever Ayush Anti Cavity Clove Oil Toothpaste, whitening rock salt tooth paste and Freshness Gel Cardamom Toothpaste.
12. Sri Sri Tattva Ayurveda Sudanta Toothpaste: Sudanta Toothpaste from Sri Sri Tattva Ayurveda is one of the well-known completely free fluoride toothpaste and packed with ancient herbs used in Ayurveda such as Cloves, Cinnamon, Black pepper, Bakul and Mayaphal.

4. Data Analysis

The descriptive or percentage analysis is mainly carried out to determine the percentage of respondents fall under each category. This analysis also helps to standardize the respondents' opinion on various aspects. This analysis is carried out for all the questions given in the questionnaire. To compute the percentage analysis the following formula is to be followed. = $\frac{\text{Number of respondents for the particular factor}}{\text{Total number of respondents}} \times 100$

Chi-square test χ^2 It is a statistical measure used in the context of sampling analysis for comparing a variance to a theoretical variance. The Chi-square test was employed in order to find out the relationship between the factors like age and brand preference, Income and brand preference etc., family size of brand preference. The test involves computing χ^2 value from the sample data. The χ^2 value is [calculated with the help of the following formula. Here, $\chi^2 = \sum \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$

Here, O_{ij} = refers to the observed frequencies.

5. Finding Suggestion and Conclusion Findings

- The majority (55%) of the respondents are male
- The majority (57%) of the respondents are in the age group of 21 between 30
- The majority (54%) of the respondents are students.
- The majority (41%) of the respondents are 4 members.

- The majority (59%) of the respondents are income above Rs.10,000.
- The majority (54%) of the respondents are post graduate level in education.
- The majority (51%) of the respondents are decision maker in purchasing toothpaste is the family leader.
- The majority (37%) of the respondents use Colgate toothpaste.
- The majority (75%) of the respondents are known about the product through television.
- The majority (52%) of the respondents will buy the quality of the brand.

The majority (43%) of the respondents will identify the toothpaste in departmental stores.

- The majority (73%) of the respondents are used their specific brand above 4 years.
- The majority (42%) of the respondents are buy the product line of 100gms.
- The majority (38%) of the respondents buy the toothpaste for its economy.
- The majority (74%) of the respondents are not wished to change their brand of toothpaste forever.

Suggestions

In the present study, an attempt has been made to measure the customer's satisfaction towards the toothpaste for measuring customer's satisfaction, various factors were considered. This study has provided a way for further research also.

1. In this study, it was found that majority of sample respondents opinioned that price of the toothpaste is high. Hence, it is suggested that the manufacturers should fix the reasonable price by considering the college students affordability
2. In this study, it was found that majority of sample respondent's opinion that the quality of the toothpaste to be improve. Hence, it is suggested that manufacturers of toothpaste should make their toothpaste with good quality ingredients.
3. It was suggest that majority of the sample respondents preferred to buy 100gms paste. Hence, it is suggested that the producers of the toothpaste may produce the toothpaste at 100gms quantity and this will fulfill the requirements of majority of the sample respondents.
4. Preferred and interested to buy the toothpaste at a specified price along with some gift and price offer scheme. Hence, It is suggested that producers of toothpaste should makes their toothpaste with some offer like price deduction, free gift, coupon, etc.,
5. Influenced by television, advertisement to go for a specified brand of toothpaste that the producers should focus their marketing strategy though television advertisement with either sponsored programme or spot programme.

6. Respondents expect only the related product along with the product as a discount/free gifts.
7. Advertisement in every possible media would increase the market share

Conclusion

One of the products, which was very successful and has found a permanent place for itself in the minds of the college students, is the Colgate toothpaste and today the market is flooded with various brands of Colgate Toothpaste. In spite of the availability of many Colgate Toothpaste, the study reveals that the consumer purchase the brand, which is better in quality and has a reasonable price and the college students also have the feeling that it fights with tooth decay. It is also from the study that no new strategy adopted by any new brand affects consumer's loyalty to their present brand. It is evident from the study that to have a permanent place in the minds of the consumer, that is brand loyalty, a company has to devote much attention to the cardinal factors like quality, pricing, features, and the like. Toothpaste helps in grinding the food necessitates the caring teeth. Teeth can be cared by keeping their clean by using toothpaste. Hence a study has been under taken to know the customer satisfaction and preference.

Bibliography

1. Leon .G.Schiffman (1999). "Customer Satisfaction", Printice hall of India, New Delhi.
2. Philip Kotler 2000, "Marketing Management" 10th edition, print ice hall of India, New Delhi.
3. Miskell, P. (2004). Cavity protection or cosmetic perfection? Innovation and marketing of toothpaste brands in the United States and Western Europe, 1955–1985. *Business History Review*, 78(1), 29-60.
4. Vani, G., Ganesh B, M., & Panchanatham, N. (2010): Oral care industry: Colgate's smiley promos, *Advertising Express*
5. Cassell, D. (2015). *The Incredible Herb Trimpe*. Raleigh, North Carolina: TwoMorrrows Publishing.

ISSN 2277 - 5730
AN INTERNATIONAL MULTIDISCIPLINARY
QUARTERLY RESEARCH JOURNAL

AJANTA

Volume - XI

Issue - II

April - June - 2022

ENGLISH PART - II

Peer Reviewed Refereed
and UGC Listed Journal

Journal No. 40776



ज्ञान-विद्या विभूतये

IMPACT FACTOR / INDEXING

2020 - 6.306

www.sjifactor.com

❖ EDITOR ❖

Asst. Prof. Vinay Shankarrao Hatole

M.Sc (Maths), M.B.A. (Mktg.), M.B.A. (H.R.),
M.Drama (Acting), M.Drama (Prod. & Dir.), M.Ed.

❖ PUBLISHED BY ❖



Ajanta Prakashan

Aurangabad. (M.S.)

The information and views expressed and the research content published in this journal, the sole responsibility lies entirely with the author(s) and does not reflect the official opinion of the Editorial Board, Advisory Committee and the Editor in Chief of the Journal “AJANTA”.
Owner, printer & publisher Vinay S. Hatole has printed this journal at Ajanta Computer and Printers, Jaisingpura, University Gate, Aurangabad, also Published the same at Aurangabad.

Printed by

Ajanta Computer, Near University Gate, Jaisingpura, Aurangabad. (M.S.)

Printed by

Ajanta Computer, Near University Gate, Jaisingpura, Aurangabad. (M.S.)

Cell No. : 9579260877, 9822620877, Ph. No. : (0240) 2400877

E-mail : ajanta6060@gmail.com, www.ajantaprakashan.com

AJANTA - ISSN 2277 - 5730 - Impact Factor - 6.306 (www.sjifactor.com)

❧ CONTENTS OF ENGLISH PART - II ❧

S. No.	Title & Author	Page No.
1	Vulnerability of Konkan's Economy on Climate Extremes: An Overview Umesh Milind Kamat	1-7
2	Studies on Current Status of Marine Captured Fishery of Sindhudurg Coast, M.S., India Nanasaheb P. Kamble Tejas Sawant	8-14
3	New Education Policy 2020 Miss. Smita Vilas Parab	15-20
4	A Study on Impact of Covid 19 on Digital Marketing in India Mrs. Geetashree Sagar Thakur	21-28
5	Studies on Government Promotional Strategy for Indian Pharmaceutical Sector @ 75 Suhas G. Patil Umesh K. Samant Peter R. Rodrigues	29-39
6	A Study on Growth of Foreign Direct Investment in India Mrs. Suvarna Jayesh Nikam	40-48
7	Agricultural Trade of India through Regional Trade Agreements (RTAs) Mr. Krishnakumar Nanu Bandolkar	49-54
8	An Overview of Fishing Industry with Respect to Maharashtra-India Swapnil Yashwant Joshi Dr. Yasmeen K. Aowte	55-63
9	A Study of Modern Technological Scenario of Banking Sector in India Mrs. Saba Ibrahim Shaha	64-74
10	Poverty Alleviation in India & Role of MGNREGS Dr. Ravikiran R. Garje	75-79
11	Review Study on Digital Currency Dr. Devendra N. Vyas	80-85

11. Review Study on Digital Currency

Dr. Devendra N. Vyas

Principal, Smt. Radhadevi Goenka College for Women, Akola.

Abstract

Bitcoin is famous as white paper. It is a reward of mining process hence known as Bitcoin. It is useful as a exchange tool for currency, products and services. But there are some lacunas of Bitcoin like people are using it for illegal transactions, large amount of electricity is used for mining process hence it's not eco-friendly, price volatility and thefts from exchanges etc. It's just creating speculative perspective in investor's mind. In this paper, Researcher has described the buying process of Bitcoins, related risk factors and how the Bitcoin is decentralized and ratio of acceptance in the globe.

Keywords: Digital Currency, Bitcoin, Risk, Decentralization.

Introduction

In recent budget, it is very clear that Government is ready to give importance to digital currency. It has much more potential. It can streamline the current financial infrastructure, making it cheaper so as it possible to do faster financial transactions. It supports central Bank to make monetary policy effective. There are various kinds of digital currency like crypto currencies, central bank's digital currency and stable coins.

One of them is Bitcoin. In this paper, Researcher has studied the concept of Bitcoin. How it supports to make transactions very active and the flow of Indian Economy. The most important thing the acceptance of digital currency. In Union Budget 2022, as we know Government is ready to charge TDS on digital currency which is solving the issue of legality is going to solve it.

Definitely, it will motivates and encourages them people to invest in more in Bitcoin. Now, people are more aware about the investment in Bitcoin. It will boost the investment and the buying behavior of people. Bitcoin is form of crypto currency which is working as peer-to-peer payment system. Crypto currency is digital currency. It is consideration that it more secures as real money. There are some positive aspects of Bitcoin like it is not administered or controlled by any specific regulatory body like RBI; on the contrary, it is monitored by Block chain

Technology which serve as a public ledger for all transactions. Hence, there are no rules and regulations are framed. In case of any dispute, there is no exact solution. One should purchase, on its own risk. Now, crypto currency is a hot topic in all over globe and there is huge volatility in crypto currencies exchange rates. Investment in crypto currency is high risk of trading. Hence, it is gaining the attention of speculators. The current decision of Government will definitely motivate the investor to invest in digital currency.

Review of Literature

1. **Bitcoin: An innovative alternative digital currency- Grinberg, R. (2011):** This paper has thrown light on some legal issues the Stamp Payments Act, Liberty Dollar Creator and the federal securities act. It also allows the organizations to receive donations and conduct business anonymously.
2. **Central bank digital currency and the future of monetary policy-Bordo, M. D., & Levin, A. T. (2017)** has concluded that CBDC definitely transform all the aspects of economy which support to sustain the monetary system and facilitate the systematic and clear monetary policy.
3. **The macroeconomics of central bank issued digital currencies- Barrdear, J., & Kumhof, M. (2016)** described that macroeconomic effects of issuing of CBDC is globally accessible and interest-bearing central bank liability, implemented through distributed ledgers which competes with bank deposits as medium of exchange.
4. **Central Bank Cryptocurrencies. - Bech, M. L., & Garratt, R. (2017):**In this book, author has described that now its era of digitalization and digital currency is important aspect of it. If central bank issues crypto currencies, will it useful? In the same way, the peculiarity provides two types of CBCC i.e. retail and wholesale and differentiates them from other forms of central bank money such as cash and reserves.
5. **Central bank digital currencies-design principles and balance sheet implications- Kumhof, M., & Noone, C. (2018):**In this paper, three models of CBDC have described which focuses on core principles, bank funding is not necessarily reduced, credit and liquidity provision to the private sector need not contract, and the risk of a system-wide run from bank deposits to CBDC is addressed.
6. **Broadening narrow money: monetary policy with a central bank digital currency-Meaning, J., Dyson, B., Barker, J., & Clayton, E. (2018)-** In this paper, Researchers

have inferences that CBDC and its impact on monetary transmission mechanism. They investigate how CBDC could affect the various stages of transmission, from markets for central bank money to the real economy and monetary policy would be able to operate much as it does now, by varying the price or quantity of central bank money and that transmission may even strengthen for a given change in policy instruments.

7. **Central bank digital currency: Motivations and implications - Engert, W., & Fung, B. S. C. (2017)**- This paper addresses that central bank should issue digital currency and it also similar to cash. Then it described digital currency. The implications of such a digital currency are explored, focusing on central bank's monetary policy, the banking system and financial stability, and payments.
8. **Designing new money-the policy trilemma of central bank digital currency- Bjerg, O. (2017)**: There are three different scenarios viz. 'money user scenario', 'money manager scenario' and 'money maker scenario' for the implementation of CBDC in terms of their monetary policy implications has used here. The evaluation is depending on an adaption of the classical international monetary policy trilemma to a domestic monetary system with multiple forms of money.

Objective of Study

- To review study on Digital currency.
- To study the process of buying Digital Currency.
- To analyze risks of Digital Currency.

Research Methodology

Researcher has used secondary data and Descriptive Method is applied for writing this paper.

Buying Process of Bitcoin

If currency is in flow then it has importance in economy. As more and more currency in circulation and acceptance in business transactions, it grows. Now Bitcoin is in flow where Dell, Microsoft and other multinational companies are preferred to it. In a country like Australia Bitcoin is considered as traditional currencies.

- **Be ready with Bitcoin Wallet:** It is a virtual storage center like our physical wallet where we hold cash, debit and credit cards. Hence, one should ready with Bitcoin Wallet which is basic and foremost important aspect to purchase Bitcoin. This wallet is

based on software. It is online medium which are offered by some companies like Coinbase and Ledger, Electrum, Cold Storage etc.

- **Selection of Bitcoin Exchange:** After having a wallet, one should register with a fiat-to crypto exchange. Fiat currency is a currency which is issued by government like U.K. Dollars, Euros etc. Actually, Bitcoin exchange is working as a mediator and the company sells cryptocurrency from their collection and instead of this service, they will charge amount. For example, eToro, Coinbase Gemini etc. exchanges are providing such type of services.
- **Registration:** After selection of proper Bitcoin exchange, one must register and complete the security process but the accurate details will be changed exchange to exchange. In short, one must visit to Home Page and click on Register then enter email address and set the password, afterwards one will get confirmation email. As soon as we click on the link, we will enter in the dashboard of page of our new cryptocurrency exchange account.
- **Security Checks:** After registration one must complete security check process. In this regard, one must complete few steps so that one can start purchasing Bitcoin. This process may vary exchange to exchange. In this checking process generally, they are asking about anti-money laundering, Know Your Customer rules of the country to which exchange is concerned. Phone number verification is one of the authentic aspects of security check. Further basic enquires like upload Photo or scan copy of ID
- **Payment Method:** Afterwards one must add bank details, debit card or credit card but it depends on the nature of transaction and quantity.
- **Deposit Funds to Exchange Account:** Next step is choosing your required amount and transfer to exchange. After completion of this process, purchaser has, money in the fiat wallet of exchange account consequently buyer can use the cash to buy Bitcoin.
- **Purchase Bitcoin:** This is final step, here purchaser has to click on the Buy/Sell button and choose the value of Bitcoin and wait for completion of transaction process.

After completion of buying process, one can transfer bitcoins in one's wallet, trade with bitcoins and spend bitcoins.

Risk of Bitcoin Transactions

Bitcoin is decentralized hence it has many risk factors because of it people always think before purchasing it. They are as under:

- There is No central body to control Bitcoin management.
- There is no central server for it; hence it depends on peer –to-peer aspects.
- Its depend on public ledger; anybody can store it on computer.
- Anyone can become a miner of it because of it anybody can create a new address for bitcoin.
- Anyone can send a transaction to the network without any kind of approval

Crypto Adoption in Globe

Maximum countries of the globe are using crypto currency. There are many companies who are accepting payment in crypto currency. As it is become a trend and businesses are also growing very rapidly. As of 2021, world global crypto ownership rates at an average of 3.9%, with above 300 million crypto investors are found in globe. In the same way, above 18,000 businesses are accepting payments in crypto currencies accepting payment in crypto currency.

As per Recent information of February 2021, Bitcoin market cap reached US\$1 trillion

Bitcoin is also constituted 66% of the total market capitalization of cryptocurrencies in 2020.

Top Countries & their Investment in cryptocurrencies

Sr.No.	Country	Investment in US\$
1	India	100 million
2	USA	27 million
3	Nigeria	13 million
4	Vietnam	5.9 million
5	United Kingdom	3.3 million

In regards of owners demographic data, 79% are male and 21% are female, among them 58% are aged under 34, 82% have a Bachelor's degree or Higher Education and 36% have an annual income over US\$100k.If we compare period of 2012 and 2021, the price of Bitcoin increased by more than 540,000%. Bitcoin has reached an annual growth rate if 274% in the year 2020 as a result of this, cryptocurrencies market is estimated to grow with a compound annual growth rate of 56.4% from the year 2019 to 2025.

Conclusion

Bitcoin is recent trend of market because of its acceptability and usability. Investors are ready to prefer it. Indian Government is also ready to launch digital currency, as it is declared in Union Budget-2022. It has some positive and negative aspects also. Risk factor is playing a vital role in the development of economy and Bitcoin is not different from it. It is very close to Blockchain Technology. On the basis of above discussion, it is clear that if cryptocurrencies get legal existence, definitely it will grow like a share market.

References

1. Grinberg, R. (2011). Bitcoin: An innovative alternative digital currency. *Hastings Science & Technology Law Journal*, 4, 160.
2. Bordo, M. D., & Levin, A. T. (2017). *Central bank digital currency and the future of monetary policy* (No. w23711). National Bureau of Economic Research.
3. Barrdear, J., & Kumhof, M. (2016). The macroeconomics of central bank issued digital currencies.
4. Bech, M. L., & Garratt, R. (2017). Central bank cryptocurrencies. *BIS Quarterly Review September*.
5. Kumhof, M., & Noone, C. (2018). Central bank digital currencies-design principles and balance sheet implications.
6. Meaning, J., Dyson, B., Barker, J., & Clayton, E. (2018). Broadening narrow money: monetary policy with a central bank digital currency.
7. Engert, W., & Fung, B. S. C. (2017). *Central bank digital currency: Motivations and implications* (No. 2017-16). Bank of Canada Staff Discussion Paper.
9. Bjerg, O. (2017). Designing new money-the policy trilemma of central bank digital currency.
10. Mancini-Griffoli, T., Peria, M. S. M., Agur, I., Ari, A., Kiff, J., Popescu, A., & Rochon, C. (2018). Casting light on central bank digital currency. *IMF Staff Discussion Notes*, 18(08).
11. <https://triple-a.io/crypto-ownership/>

View article x Recognition of Devanagari Num... x +

Not secure thedesignengineering.com/index.php/DE/article/view/6760

DESIGN ENGINEERING

Register Login

HOME CURRENT ABOUT US ARCHIVES CONTACT ABOUT ▾

SEARCH

HOME ARCHIVES / VOL 2021: ISSUE 08 / Articles

Recognition of Devanagari Numerals Using Jordan-Elman Network for CAPTCHA Design

P. S. Bodkhe, P. E. Ajmire

PDF

ABSTRACT

Devanagari is an Indo-Aryan script adopted by most of the Indian languages. The languages like Hindi, Marathi, Konkani, Haryanvi, Rajasthani, and Bhojpuri are derived from Devanagari. In India, nearly 77% of total population speaks and write in Devanagari based languages and use it for various commercial transactions. Most of the Government schemes are launched on websites. In most part of India, people use

HOW TO CITE

P. S. Bodkhe, P. E. Ajmire. (2021). Recognition of Devanagari Numerals Using Jordan-Elman Network for CAPTCHA Design. *Design Engineering*, 16132-16138. Retrieved from <http://thedesigengineering.com/index.php/DE/article/view/6760>

MAKE A SUBMISSION

CONTACT US

Editorial Office of Design Engineering.
Address: 4143 Danforth Avenue Toronto, ON M4K 1A6.
Email: editor@thedesigengineering.com

Downloads

Paper Template Download

Information and Guidelines

- Author Guidelines

Search

12:04 PM

RECOGNITION OF PRINTED DEVNAGARI CHARACTERS USING A SET OF OPTIMALLY DESIGNED MOMENT FEATURES WITH COMBINATION OF DCT, HAHN AND TCHEBICHEF

A.A. Tayade¹ and R.J. Ramteke²

¹G.S. Science, Arts and Commerce College Khamgaon, MS, India

²Shool of Computer Science, K.B.C. North Maharashtra University, Jalgaon, MS, India

¹arvindtayade40@gmail.com, ²rakeshramteke@yahoo.co.in

ABSTRACT

The crucial issue of the character recognition is the identification of similar characters. In this paper, a character recognition technique is proposed for identification of similar characters by increasing commonly used feature of selected image with gradient features from potentially discriminative image regions. The crucial regions of identical characters sets are automatically detected here. Experimental results on Typed Devnagari Character Lanna Dhamma demonstrate the capability of the proposed method in discriminating visually similar characters. The method also outperforms existing character recognition methods by considerable margins. It has a great potential for character recognition of other alphabets.

Keywords: Devnagari, DCT, Hanh, Tchebichef, Image Acquisition, Segmentation

Introduction

Typed Devnagari Character recognition is the task of transforming a language represented in its spatial form of graphical marks into its symbolic representation. There are two kinds of Typed Devnagari Character input, on-line and off-line [18]. On-line Typed Devnagari Character input maintains the time series of writing points, order of strokes and additional information about pen tip (velocity, acceleration). For example, Typed Devnagari Character input methods on cell phones and tablets receive on-line h Typed Devnagari Character input when users touch the screen. Preprocessing of on-line recognition includes noise removal, stroke and character segmentation. Off-line Typed Devnagari Character input only preserves images of the completed onboard writing area. For example, banks recognize Typed Devnagari Character amounts on checks. Preprocessing of off-line recognition includes setting thresholds to extract writing points, removal of noise, segmentation of writing lines, and finally segmentation of characters and words.

Character acknowledgment framework is significant part of the of example acknowledgment. Character acknowledgment is a stepwise cycle of preprocessing, highlight extraction, and characterization. Character acknowledgment precision depends of the adequacy of each progression. In character acknowledgment, precision diminished

because of certain limitations like mathematical misalignment through character style varieties, clamor, and undesirable data in picture, size of the picture and in particular the fluctuating picture foundation. Expanding the exactness and improving the FRT model, need to choose of the legitimate element extraction system and appropriate classifiers.

In proposed system we present the character acknowledgment calculation incorporates LBP, directional component, Combination of (DCT+Hann+Tchebichef), summation method. The system will talk about here have ability of picture commotion, brightening, impact of scaling and revolution invariant.

The main significant advance in any character acknowledgment framework is pre-handling followed by division and highlight extraction. Pre-handling includes with the means that are needed to shape the info picture into a structure reasonable for division. In division step, the information picture is divided into singular characters and afterward, each character is resized into $m \times n$ pixels towards preparing the organization. There are six major stages in the Character Recognition those are

- **Image Acquisition**
- **Pre-Processing**
- **Image Segmentation**
- **Feature Extraction**
- **Image classification**
- **Post processing**

- **Image Acquisition:** Take a picture using digital camera of the document or scan the document and save it in a computer with proper image extension.
- **Pre-processing:** In this process the image undergoes the following operations as shown in the block diagram, the input to the Pre-Processing stage is the stored image in the computer.
- **Image Segmentation:** Image segmentation is nothing but dividing the whole image into small sub-images based on the uniqueness
- **Feature extraction:** Feature extraction is the main part of the Character identification process, this is the process where each character will be represented as a feature vector ,the unique feature of this step,the focus of this stage is to extract a set of features of the segmented image to improve character recognition rate
- **Image Classification:** Once the features are extracted in feature vectors the will be given to image classifiers such as K-nearest Neighbourhood (K-NN),Bayes Clasifier ,neural networks, Hidden Markov Model (HMM) and so on,these clasifiers are the decision makers of the algorithms.
- **Post-Processing:** In this stage based on the decision from classification stage the recognized fonts will be printed in editable form on digital screen.

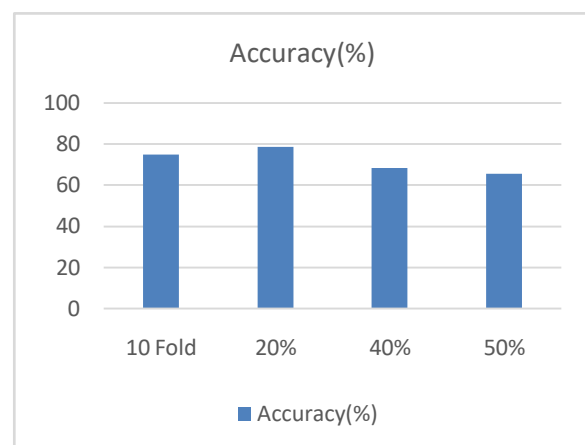
Experimental setup for Lanna dhamma

Lanna Dhamma alphabet was used mainly for religious communication in the ancient Lanna Kingdom of Thailand. The old manuscripts using this alphabet are gradually decayed. It is desirable to preserve these valuable manuscripts in machine-encoded text files. Existing works used optical character recognition (OCR) methods based on wavelet transform for recognition of handwritten Lanna Dhamma characters. This method contains Tchebichef, Hahn, DCT transform we are use these three combinations for features extraction use by proposed technique. Charterer dived In to three sections mid bar, no bar and end bar result shown in below.

End Bar Character Lanna Dhamma

In End bar character data set the take the various character having end bar with the different font size and style. In such dataset total 18 characters appear. Total number of images in database is 630. Each class contains total 35 images with 7 different fonts style and 5 different font Size. In proposed technique we apply the Lanna Dhamma characters recognition the combination of three technique on each image and extract 150 features per image i.e. total **94500** features and make the class of each number having predictor label with character name. Classify that data set using the classifier and result shown below.

Data Validation	Accuracy(%)	Classifier
10 Fold	74.90	Ensemble Subspace KNN
20%	78.60	Ensemble Subspace KNN
40%	68.30	Ensemble Subspace KNN
50%	65.40	Ensemble Subspace KNN

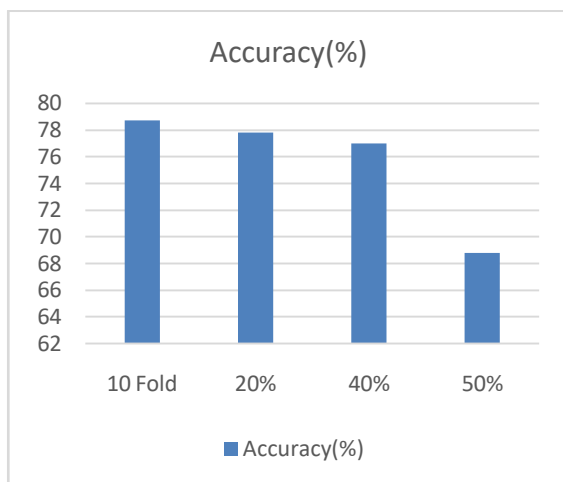


No Bar Character lanna dhamma

In No bar character data set the take the various character having no bar with the different font size and style. In such dataset total 9 characters appear. Total number of images in database is 315. Each class contains total 35 images with 7 different fonts style and 5 different font Size. In proposed technique we apply the Lanna Dhamma characters recognition the combination of three technique on each image and extract 150 features per image i.e. total **47250** features and make the class of each number having predictor label

with character name. Classify that data set using the classifier and result shown below.

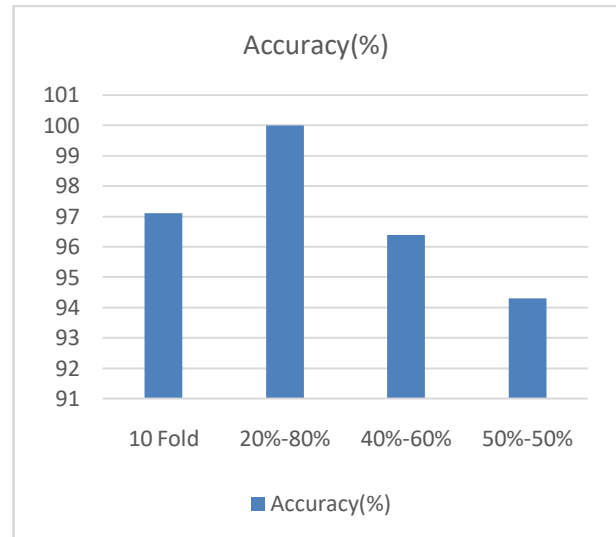
Data Validation (method)	Accuracy(%)	Classifier
10 Fold	78.70	Ensemble Subspace KNN
20%	77.80	Ensemble Subspace KNN
40%	77.00	Ensemble Subspace KNN
50%	68.80	Ensemble Subspace KNN



Middle Bar Character lanna dhamma

In middle bar character data set the take the various character having middle bar with the different font size and style. In such dataset total 2 characters appear. Total number of images in database is 70. Each class contains total 35 images with 7 different fonts style and 5 different font Size. In proposed technique we apply the Lanna Dhamma characters recognition the combination of three technique on each image and extract 150 features per image i.e. total **10,050** features and make the class of each number having predictor label with character name. Classify that data set using the classifier and result shown below.

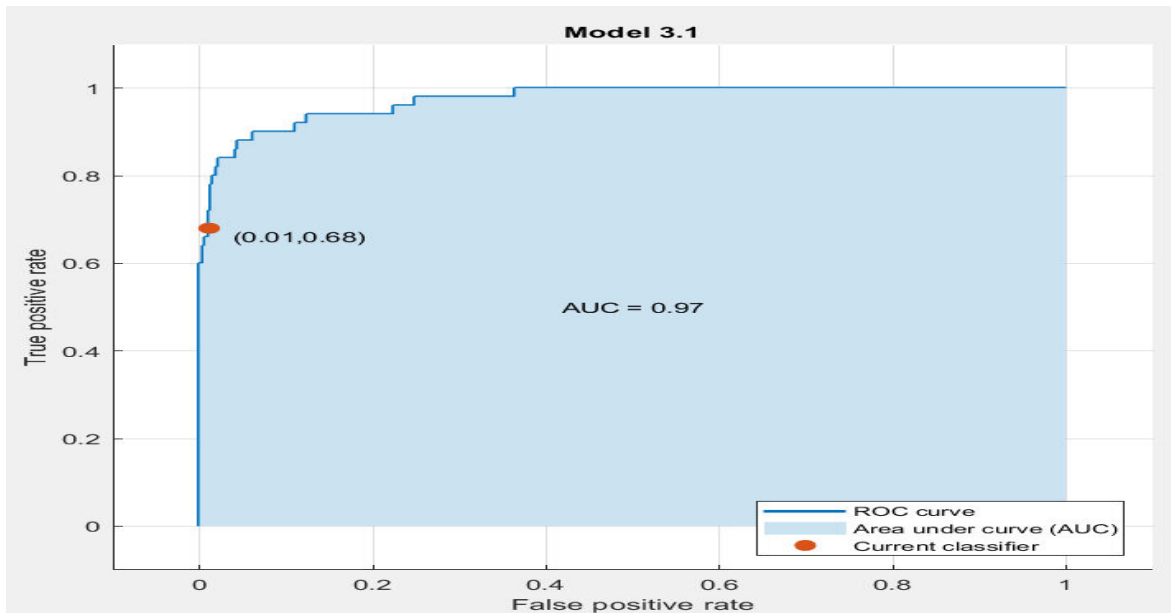
Data Validation method	Accuracy(%)	Classifier
10 Fold	97.10	KNN
20%	100.00	Ensemble Subspace KNN
40%	96.40	Ensemble Subspace KNN
50%	94.30	Ensemble Subspace KNN



Number database Lanna Dhamma

In numeric data set the take 0 to 9 number having varying the font size and style. Total number of images in database is 500. Each class contains total 50 images with 10 different fonts style and 5 different font Size. In proposed technique we apply the three techniques on each image and extract 150 features per image i.e. total 75000 features and make the class of each number having predictor label. Classify that data set using the classifier. Comparative analysis shown in following table.

Data Validation method	Accuracy(%)	Classifier
10 Fold	87.40	Ensemble Subspace KNN
20%	85.00	Ensemble Subspace KNN
40%	81.00	Ensemble Subspace KNN
50%	73.20	Ensemble Subspace KNN



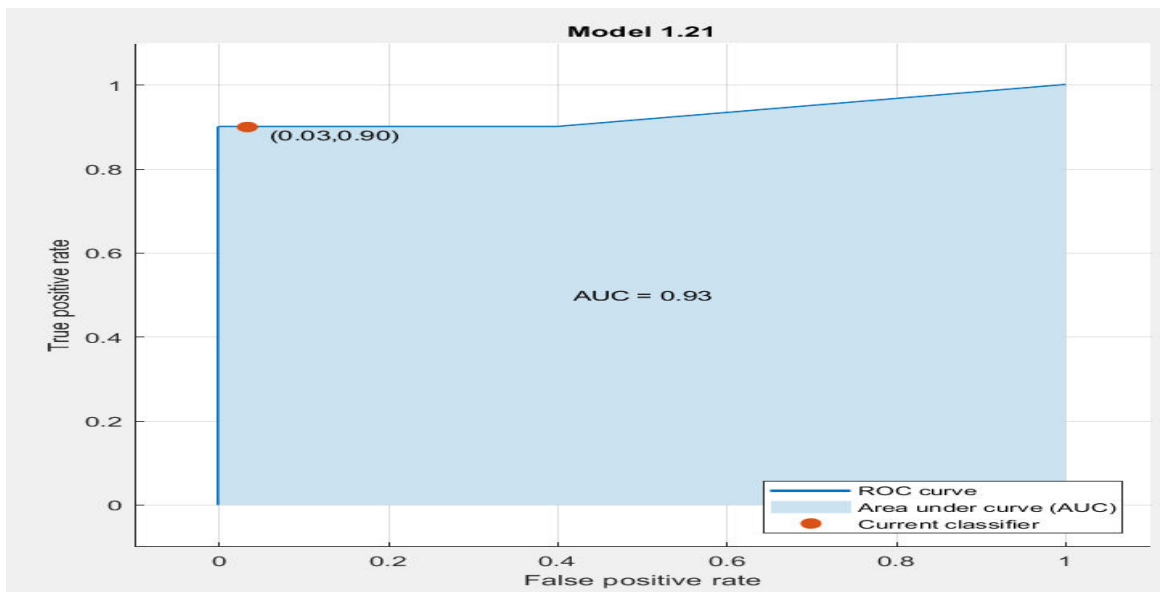
Model 1.21

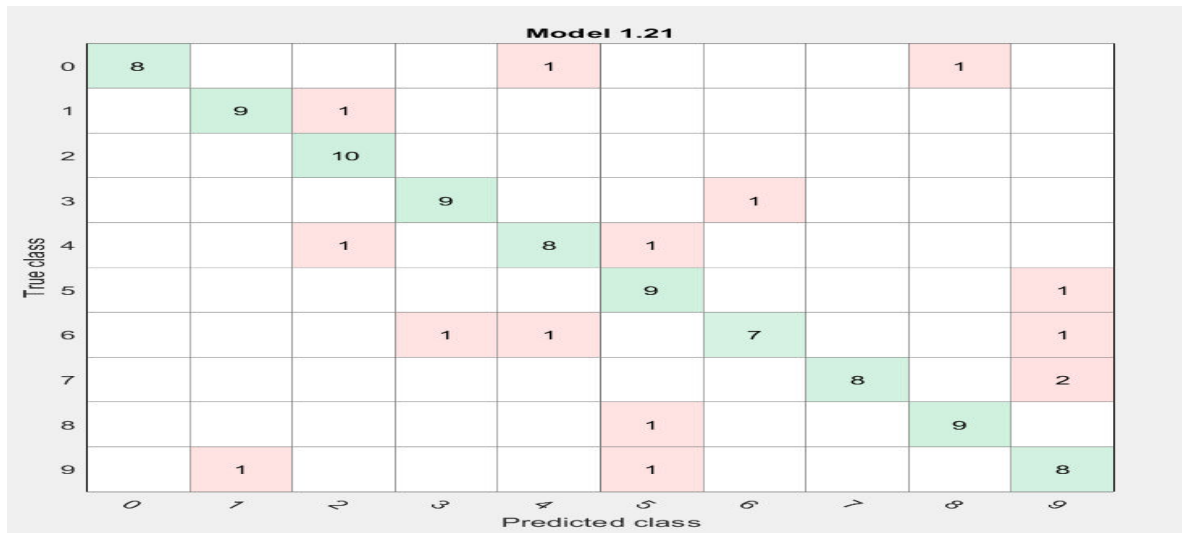
0	46	1			1	1			1	
1	2	40		1	1	5				1
2		1	48			1				
3				43	2	1	4			
4	1	1	1	1	40	2	3			1
5		1			1	44			1	3
6				3	3	1	39			4
7					1	1	2	46		
8						1			49	
9		1			2	4	1			42
	0	1	2	3	4	5	6	7	8	9

True class

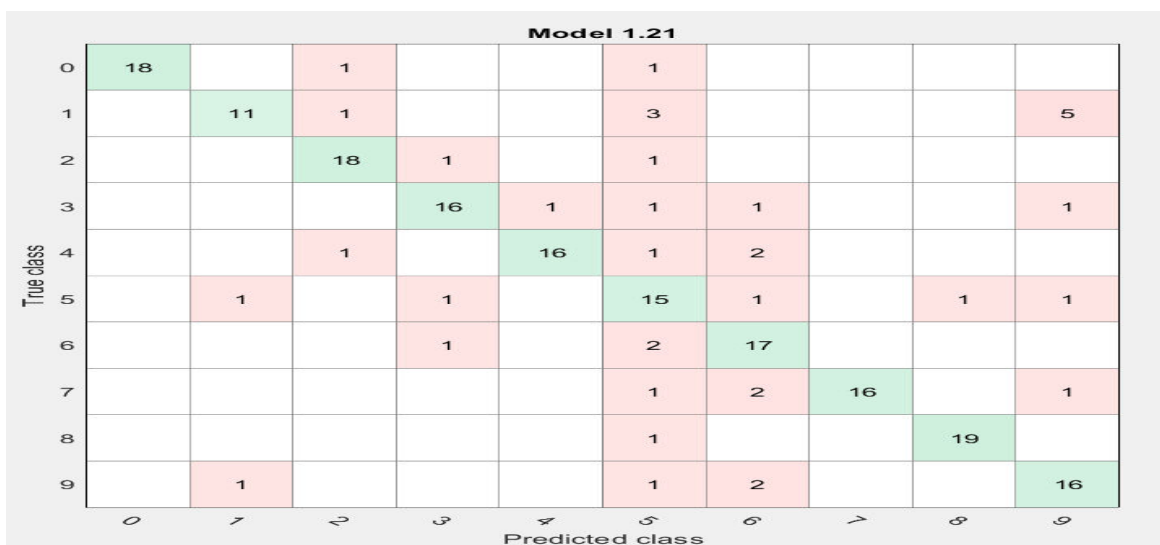
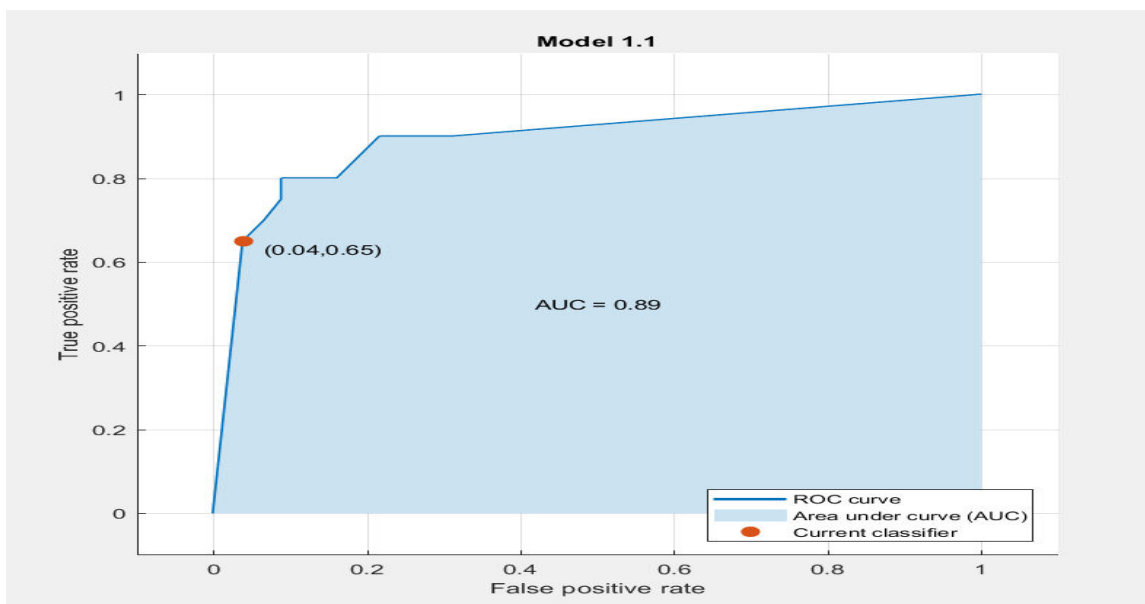
Predicted class

Number 10 fold lanna dhamma 3 features

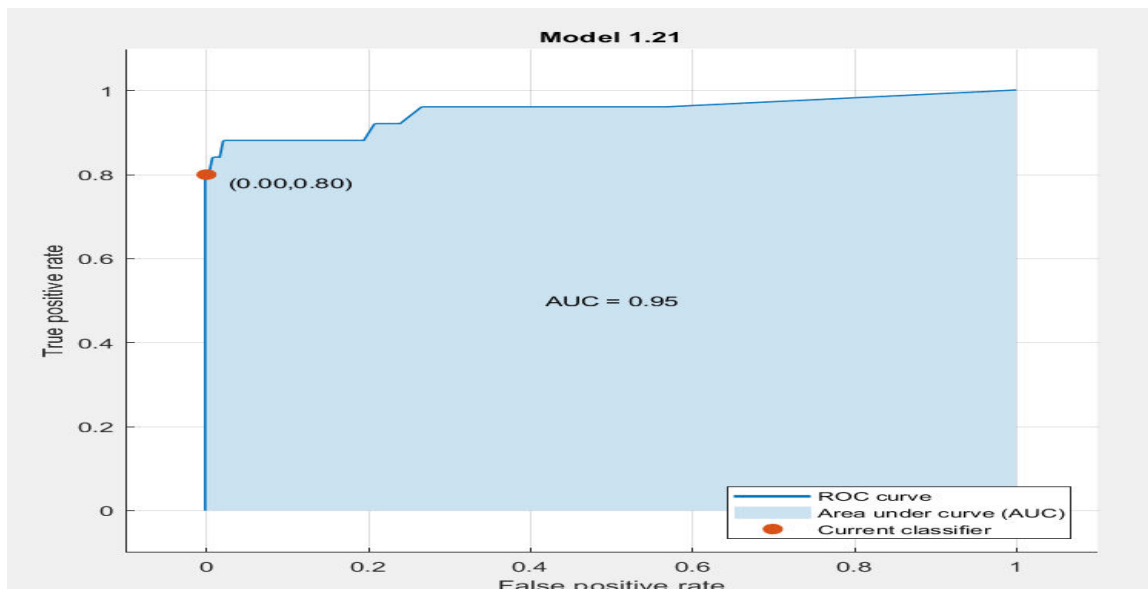




Number 20% -80% validation lanna dhamma 3 features (number database)



Number 40% -60% validation lanna dhamma 3 features (number database)



Model 1.21

0	100%	9%	3%		3%	4%				
1		68%		4%	3%	4%			18%	
2		5%	79%	4%						
3		14%	3%	74%	6%		6%		3%	
4		5%		13%	53%	4%	13%		3%	
5			3%	4%	6%	74%		4%	8%	
6			7%		22%	4%	69%	4%	8%	
7					3%		6%	100%	8%	
8			3%					88%	3%	
9					3%	9%	6%		51%	
Positive Predictive Value	100%	68%	79%	74%	53%	74%	69%	100%	88%	
False Discovery Rate		32%	21%	26%	47%	26%	31%	12%	49%	
	0	1	2	3	4	5	6	7	8	
	Predicted class									

Number 50% -50% validation lanna dhamma 3 features (number database)

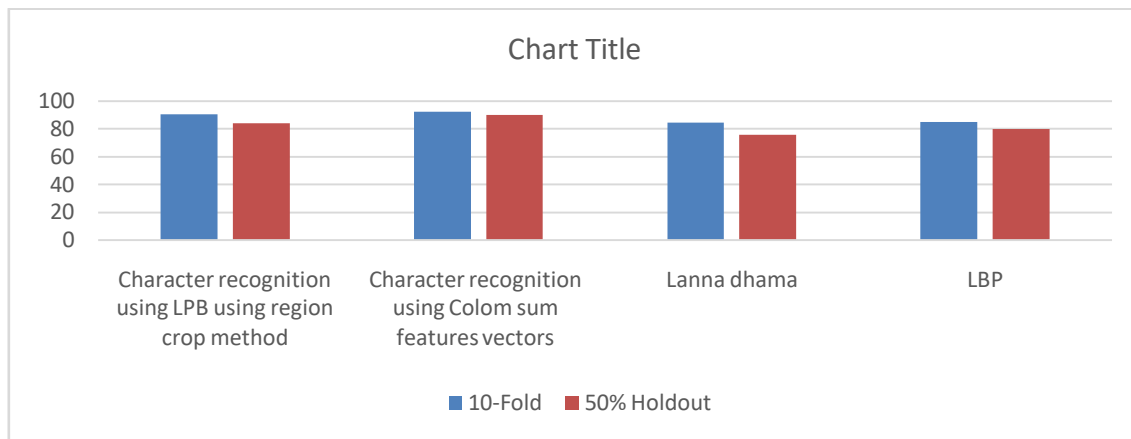
Comparative analysis of various method

As per the testing of various methods used for the character recognition, the following shows various methods are used to recognition of character. In this section, we display the comparative table of all method to find out the efficient method for character recognition. In this LBP, lanna dhama, summation method and

LBP by cropping the important segment in character. In such table we calculate the average of 10 fold cross validation, 80% training 20 % random testing, 60% training 40 % random testing and 50% training 50% random testing operations perform to calculate the highest effective method for character recognition.

Character recognition using LPB using region crop method

Character recognition using LPB using region crop method	Data validation Technique	Average Recognition Accuracy	Average Accuracy (%)
Character recognition using LPB using region crop method	10-Fold	(77.9+87.9+100+94.80)/4	90.15
	50% Holdout	(76.8+70.7+100+87.6)/4	83.77
Character recognition using Colom sum features vectors	10-Fold	(82.50+91.70+100+93.80)/4	92
	50% Holdout	(78.40+91.70+100+89.20)/4	89.82
Lanna dhama	10-Fold	(87.40+97.10+78.70+74.90)/4	84.52
	50% Holdout	(73.20+94.30+68.80+65.40)/4	75.42
LBP	10-Fold	(88.60+80.30+95.70+74.90)/4	84.87
	50% Holdout	(80.40+75.40+97.10+66.30)/4	79.8



Conclusion

In this paper we listed the most popular techniques or algorithms that are already used in optical character recognition field under the branch of Image processing and pattern recognition. There are plenty of feature extraction methods using standard transformations, still there is lot more scope in

extracting the good quality features from the binary image segments, and also its observed that noise filtering at the preprocessing section improves the quality of algorithm. Here the Typed Devnagari Character Recognition is best represented with the help of Lanna Dhamma character recognition technique.

References

1. Salunkhe, P., Bhaskaran, S., Amudha, J and Gupta, D. (2017). Recognition of multilingual text from signage boards, Sixth International Conference on Advances in Computing Communications and Informatics (ICACCI), pp. 977-982
2. Sinha, R. and Bansal, V. (1995). On devanagari document processing, Systems Man and Cybernetics 1995. IEEE International Conference on Intelligent Systems for the 21st Century, vol. 2, pp. 1621-1626
3. Bansal V. and Sinha, R. (2000). Integrating knowledge sources in devanagari text recognition system, IEEE Transactions on Systems Man and Cybernetics Part A: Systems and Humans, vol. 30, no. 4, pp. 500-505
4. Ashwin T.V. and Sastry, P.S. (2002). A font and size-independent OCR system for printed Kannada documents using support vector machines, Sadhana-academy Proceedings in Engineering Sciences, vol. 27, pp. 35-58
4. Neeba, N., Namboodiri, A., Jawahar C. and Narayanan, P. (2010). Recognition of Malayalam Documents, London, pp. 125-146
6. Bansal V. and Sinha, R.M.K. (2000). Integrating knowledge sources in devanagari text recognition system, vol. 30, pp. 500-505
5. Rahman F.R. (2001). A Multiexpert Framework for Character Recognition: A Novel Application of Clifford Networks, IEEE, vol. 12.
6. Toru Wakahara A.T. (2001). AffineInvariant Recognition of Gray-Scale Characters Using Global Affine Transformation Correlation, IEEE, vol. 23.
7. D. Doermann (2004). Machine Printed Text and Handwriting Identification in Noisy Document Images, IEEE, vol. 28.
8. Roy P.P. (2004). Multioriented and Curved Text Lines Extraction From Indian Documents, IEEE, vol. 34.
9. Hagita N. (1998). Text-Line Extraction and Character Recognition of Document Headlines With Graphical Designs Using Complementary Similarity Measure, IEEE, vol. 20.

PRIORITIZATION OF DARK CHANNELS IN IMAGE DENOISING AND DEHAZING ALGORITHMS

A.A. Tayade

G.S. Science, Arts and Commerce College Khamgaon, MS, India
arvindtayade40@gmail.com

Abstract

To dehaze and denoise simultaneously, we present a new fast variant technique in this paper. In the proposed method, the transmission map is first estimated using an adaptive approach based on the well-known darkish channel before the proposed method is applied. In the end, this transmission map reduces the threshold artefact and improves estimation precision. Intensity maps can then be used to build a new version model to search for the final haze- and noise-free image. Also noted is that the proposed variant model has a strong point in the form of a minimizer. Based on the Chambolle–Pock set of rules, a numerical process is laid out that ensures that the set of regulations is consistent. The results of large-scale experiments on real-world scenes show that our method can successfully restore incredible and contrasted images that are haze and noise free.

Keywords: Dehaze, Denoise, Adaptive, Chambolle–Pock algorithm

I. Introduction

Together with haziness, foggy and smokey degradation of the outdoor scene due to bad weather conditions. It's a headache for photographers because it alters the colours and reduces the contrast of everyday photos, it diminishes the visibility of the scenes and it's a risk to the reliability of many programmes like outside surveillance, item detection, it also decreases the clarity of the satellite tv for laptop pix and underwater snaps. This is why the removal of haze from images is an essential and widely sought-after area of image processing. There are a lot of these suspended particles around, and they cause light to be scattered before it reaches the camera, resulting in a pixelated picture. A thick layer of haze obscures the meditative light in the scene and blends it with the ambient light. This pondered light (i.e. scene colorings) from mixed light tends to be improved by haze removal techniques. The visual system's stability and power can also be boosted by using this effective haze removal of photograph. You can use polarisation independent issue analysis and the dark channel earlier to remove haze from a picture. It is common for the light from a situation to dissipate before it reaches the camera's lens, and the light gathered through any digital camera lens is usually mixed with the airlight. Because of this, there will be an increase in noise, a loss of contrast between light and dark, and a lack of colour constancy. When the weather is bad, such as when aerosols, haze, fog, rain, dirt, or fumes are present, this type of degradation can be particularly damaging. Fog, for example, may also produce an albedo effect, which results in ambiguity and noise, as a common climate phenomenon.

Certain aspects of these phenomena are detrimental to comprehension and the extraction of information from images. Real-world packages urgently need effective haze removal (or dehazing) and denoising methods.

There has been a lot of interest in image dehazing and denoise in imaging technology recently. One of the great advantages of these operations is that they are completely clean. These images are visually more

appealing, as well as more suitable for many important applications, such as image segmentation, feature extraction and photo fusion, because of the absence of haze and noise. Dehazing photos can be difficult because the haze relies so heavily on unknown intensity facts. If all that's provided as input is a single photograph, the situation may be made even worse. This interdisciplinary effort includes not only machine vision but meteorology, optics, and a few aspects of PC images. Visual diversity in the ecosystem is limited by haze and fog, both of which have a significant impact on the evaluation of target scenes.

A primary goal of image evaluation is to improve visibility, restore the hues, and all other photo parameters as if the picture had been taken or received in a more favourable environment.

Computer and human vision systems can benefit from the improved and refined images provided by picture dehazing for a wide range of purposes, as the middle benefit. Most computer vision software packages, from low-level image evaluation schemes to high-level item recognition, typically rely on the input photo as the final and most reliable source of the scene's brightness.

To put it another way, regardless of how high-level an algorithm's performance, it is strongly dependent on how well and reliably the input image is processed. As long as there is haze or fog in the target scene, these algorithms will be plagued by biased and corrupted input images.

For a long time now, researchers have been working on ways to improve photo dehazing. The modern brand new can be loosely institutionalized into the most important companies. As a first step, we have schemes that don't take into account the physical modelling of a photograph and how it's formed. Such schemes only aim to enhance the visual appeal of a photograph in order to please the viewer. Dehazing schemes based on such enhancements have spread across the board.

II Block Diagram

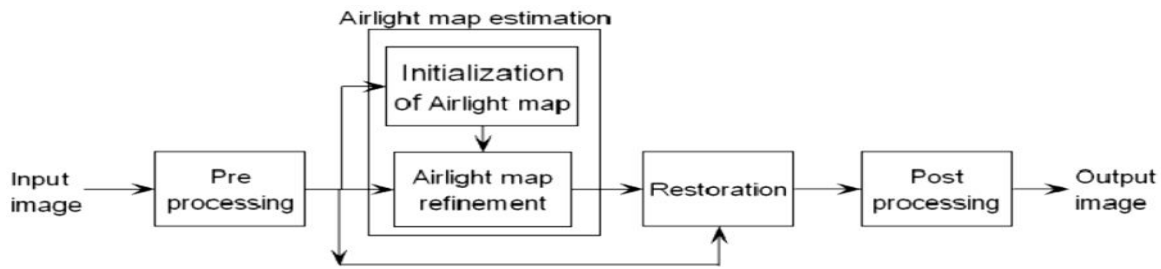


Fig 1 Block diagram of Proposed Haze removal model

The main Objectives will be:

- We present a windows adaptive method to estimate the transmission map;
- We propose a new energy model for dehazing and denoising simultaneously;
- We describe the existence and uniqueness of the minimizer of the proposed energy functional;
- To the best of our knowledge, the framework of the weighted vectorial total variation introduced here is somewhat new and could be applied elsewhere;
- This project is comprised of several components and thus has a number of key objectives
- Take as input any user-specified RGB source image that is polluted with haze.
- Accurately determine which areas are polluted with haze.
- Dehaze the image using the dark channel prior.
- Complete all computation in a reasonable amount of time (under 30 seconds for an 800x600 pixel image, if possible)

III Research Methodology/Planning of Work

The dark channel prior method has become a well-adopted. The algorithm has been used in numerous research projects to improve hazy images. A video application, for example, uses the dark channel prior to identify fog in hazy weather based on the traffic scene. The dark channel has also been extended in the past to improve underwater film and video quality. Additionally, efforts have been made to improve the current method of dark channel prior. Contrast enhancement, for example, was used to improve the contrast of the dark channel prior method, resulting in less colour distortion. Still, little effort has been made to speed up the computation time of the dark channel prior method. In the dark channel prior algorithm, there is a soft matting function. To improve the time it takes to clear up hazy images, we design an optimization algorithm that balances between a system of three bilateral filters and the darkish channel before. Using experimental results, it can be concluded that the proposed method correctly identifies hazy and clear areas in an image. Our primary goal was to improve the performance of the dark channel in the previous method, rather than to improve the quality of the final image. When compared to the traditional darkish channel prior approach, the results are significantly quicker with

speeds running at around 12 seconds for a 800x600 pixel image now.

Last but not least, techniques previously claimed their methods worked on photos that were polluted with smoke and other haze, but those methods never tested experimental results the use of photos other than hazy images. We used images of fog/haze as well as images that had been contaminated by smoke and steam in our approach. Prior to writing MATLAB code, we used a dark channel to conduct our experiments. To apply the guided joint filter in the bilateral filtering algorithm, we used MATLAB code from For the time being, we'll be running the code in MATLAB because it's a good choice for computational photography. Dehazing method as a whole and algorithm for the three-step bilateral filtering process are required. In order to produce haze-free images, the following outlines the steps and their associated functions. In our experiments, we used images taken in the field before the project as our test images. Smoke, steam, or haze can be seen in images. However, the results would be the same for a hazy or steamy image as the one used in this section.

Various computer vision-based applications now require haze removal algorithms. However, there are many aspects that have been overlooked in current approaches, such as the fact that no technique is accurate in every situation.

The results of a survey have revealed the overlooked aspects of the methods presented, such as noise reduction techniques.

Dehazing methods also face the problem of uneven and excessive illumination. Existing methods must therefore be revised in order that they function more effectively. An algorithm that incorporates a dark channel prior, CLAHE, and bilateral filter can yield better results.

IV Design and Implementation of Adaptive Filters

The adaptive filtering component of the algorithm begins after the dark channel priors of the image have been successfully computed. The dark channel priori-based image is greatly enhanced by this component, which also aids in increasing the efficiency of the algorithm's subsequent components. The term "adaptable" refers to filters that are able to change their filtering parameters (coefficients) over time in order to adapt to changing image dynamics. Adaptive filters must be able to learn on their own. The adaptive filter coefficients are able to adjust themselves as the input image arrives at the filter in order to achieve an optimal outcome, such as identifying an unknown filter

component or cancelling out noise in the input image. Some filter properties must be taken into account when designing an adaptive filter in order to get the best results. The following are a few of the benchmark properties. As a result, the rate at which a filter achieves its final state is determined by the filter's Convergence Rate. An adaptive system's ability to quickly adapt to changes in the environment is typically sought after. However, the rate of convergence is not independent of all other performance characteristics. Convergence rate will be improved at the expense of other performance metrics; this means that other performance metrics may suffer as a result.

Convergence can be sped up, but this reduces the system's stability, increasing the likelihood of divergence instead of convergence. Likewise, a decrease in convergence rate can cause the system to become more stable. This shows that the convergence rate can only be considered in relation to the other performance metrics, not by itself with no regards to the rest of the system.

- **Minimum Mean Square Error:**

As an indicator of system adaptability, the minimum mean square error (MSE) is used. Small minimum MSE indicates that the adaptive system accurately modelled, predicted and/or adjusted to the system's needs. In general, a large MSE indicates that the adaptive filter is unable to accurately model the given system or that the adaptive filter's initial state is insufficient to cause the adaptive filter to converge. Quantization noise, adaptive system order, measurement noise, and the error of the gradient due to the finite step size all play a role in determining the minimum MSE.

- **Computational Complexity**

Computational complexity is critical in real-time adaptive filtering systems. Hardware limitations can affect the performance of a real-time system when it is implemented. It will take a lot more computing power to run a complex algorithm than a simpler one.

- **Stability**

The adaptive system's most important performance metric is stability. There are very few adaptive systems that are completely asymptotically stable, due to the

nature of the adaptive system itself. The initial conditions, the transfer function, and the step size of the input determine the stability of most implemented systems.

- **Robustness**

In order to have a stable system, you must have a system that is robust. The system's ability to withstand both input and quantization noise is a measure of its robustness..

- **Filter Length**

Other performance metrics are directly related to the length of the adaptive system's filter. An adaptive filter's ability to accurately model a given system is determined by the filter's length. As a result, the filter length has an impact on the convergence rate, the stability of the system, and the minimum MSE when applied to certain step sizes. The maximum convergence rate will be reduced if the filter length of the system is increased. To put it another way, the number of computations will decrease if the filter length is reduced, thereby increasing the maximum convergence rate. You can add additional poles or zeroes to a filter in order to maintain stability when the filter length increases for a given system. To maintain stability, the maximum step size or convergence rate must be reduced. Because there aren't enough poles and zeros to model the system, the mean square error will eventually reach a nonzero constant. If the system is over specified, meaning it has too many poles and/or zeroes for the system model, it will have the potential to converge to zero, but increased calculations will affect the maximum convergence rate possible.

VI Conclusion

Algorithms based on the Dark Channel for dehazing In this paper, a major advancement in the field of picture dehazing was examined. As a result, the entire process of photograph haze removal had to be slowed down and complicated by Dark Channel's use of complex post-processing mechanisms. According to this paper's findings, improvements to the virtual image's statistics like Mean, Variance, and Entropy can be expected.

References

1. S.-R. Kuang and J.-P. Wang, "Design of power-efficient configurable booth multiplier," *IEEE Trans. Circuits Syst. I, Reg. Papers*, vol. 57, no. 3, pp. 568–580, Mar. 2010.
2. W. Ling and Y. Savaria, "Variable-precision multiplier for equalizer with adaptive modulation," in *Proc. 47th Midwest Symp. Circuits Syst.*, vol. 1, Jul. 2004, pp. I 553–I556.
3. Xilinx Inc.: XAPP 290: Two flows for Partial Reconfiguration: Module Based or Difference Based. www.xilinx.com, Sept. (2004).
4. O.A. Pfander, R. Hacker, and H.-J. Pfliederer, "A multiplexer-based concept for reconfigurable multiplier arrays," in *Proc. Int. Conf. Field Program. Logic Appl.*, vol. 3203, Sep. 2004, pp. 938–942.
5. H. Lee, "A power-aware scalable pipelined booth multiplier," in *Proc. IEEE Int. SOC Conf.*, Sep. 2004, pp. 123–126.
6. Mesquita, D., Moraes, F., Palma, J., Moller, L., Calazanas, N.: *Remote and Partial Reconfiguration of FPGAs: tools and trends. International Parallel and Distributed Processing Symposium*, (2003).
7. Meyer-Baese, U.: *Digital Signal Processing with Field Programmable Gate Arrays*. Springer, (2001).
8. Xilinx Inc.: *Development System Reference Guide*. www.xilinx.com.
9. A. Bermak, D. Martinez, and J.-L. Noullet, "High density 16/8/4-bit configurable multiplier," *Proc. Inst. Electr. Eng. Circuits Devices Syst.*, vol. 144, no. 5, pp. 272–276, Oct. 1997.

10. M. Hatamian and G. L. Cash, "A 70 MHz 8 bit x 8 bit parallel pipelined multiplier in 2.5 μ m CMOS," IEEE Journal of Solid-State Circuits, vol. 21, no. 4, pp. 505–513, 1986.
11. Yeong-Jae Oh, Hanho Lee, Chong-Ho Lee, "A Reconfigurable FIR Filter Design Using Dynamic Partial Reconfiguration", IEEE, vol-06, pp. 4851–4854, ISCAS 2006.
12. S.Karthick, Dr. S. Valarmathy and E.Prabhu," Reconfigurable Fir Filter With Radix-4 Array Multiplier" , jatit, Vol. 57 No.3, pp.326-336 , Nov.2013.
13. K.Anandan and N.S.Yogaanath, "VLSI Implementation of Reconfigurable Low Power Fir Filter Architecture" , IJIRCCE, Vol.2, Special Issue 1, pp no 3514-. 3520, March 2014.
14. Martin Kumm, Konrad M'oller and Peter Zipf "Dynamically Reconfigurable FIR Filter Architectures with Fast Reconfiguration", ieee journal of solid-state circuits, vol. 41, no. 4, april 2006.
15. Pramod Kumar Meher, Shrutisagar Chandrasekaran and Abbas Amira , "FPGA Realization of FIR Filters by Efficient and Flexible Systolization Using Distributed Arithmetic", ieee transactions on signal processing ,pp no-1-9.
16. Xiaoxiao Zhang, Farid Boussaid and Amine Bermak, "32 Bit \times 32 Bit Multiprecision Razor-Based Dynamic Voltage Scaling Multiplier With Operands Scheduler", ieee transactions on very large scale integration (vlsi) systems, vol. 22, no. 4, april 2014.
17. K.Gunasekaran and M.Manikandan," High Speed Reconfigurable FIR Filter using Russian Peasant Multiplier with Sklansky Adder", Research Journal of Applied Sciences, Engineering and Technology 8(24): 2451-2456, 2014.
18. Shidhartha Das, David Roberts, Seokwoo Lee, Sanjay Pant, David Blaau, Todd Austin, Krisztián Flautner and Trevor Mudge , "Self-Tuning DVS Processor Using Delay-Error Detection and Correction", ieee journal of solid-state circuits, vol. 41, no. 4, april 2006.
19. J Britto Pari ,et al., "Reconfigurable Architecture Of RNS Based High Speed FIR Filter" , Indian Journal Of Engineering And Material Sciences, pp. 230-240, vol.21, April 2014.

Handwritten Recognition of Rajasthani Characters by Classifier SVM

Warkhede S E

Assistant Professor, Dept. of
Computer Science Vidnyan
Mahavidyalaya
Malkapur (M.S.), India

Yadav S K

Director Research S
hri JJT University
Jhunjhunu, Rajasthan (RJ), India

Thakare V M

Professor &, Dept. Of Comp.
Sci PGTD of CSS, G B Amravati
University
Amravati, (M.S.), India

Ajmire P E

Associate Professor, Dept. of Computer Science
G. S. Science Arts & College
Khamgaon.(M.S.),India

Abstract: The entirely distinct pattern recognition technologies have been proposed over recent years and thus the different research teams focus on the effects of popularity. Because of its use in many areas, such as pattern recognition and machine learning, handwritten character recognition has found great success. In online handwritten character recognition, the basic field is for use. The various character recognition techniques were suggested in the offline handwritten recognition process. Although the techniques for transforming textual content are established by some empirical studies and publications. This textual material has been translated from a paper file into a machine-readable form. The character recognition system could help produce a paperless document as a key in the coming days. The key aspect was the digitization of paper documents and the retrieval of existing paper records as well. In this job, we took out offline samples of some Rajasthani handwritten characters. The proposed average recognition rate for machine archives is 89.82 percent, using histogram oriented gradient features and support vector machine classifiers.

Index Terms- Handwritten character recognition, Feature Extraction, Classifier.

I. INTRODUCTION

Over the past several years, every day the utilization of technology is increased exponentially. Every human being is eager to convey his feelings, thoughts to friends and family members. So it is necessary make the machine as intelligent as possible. Recognition and processing handwritten characters are motivated primarily by a desire to improve the human and machine communication. The method of reading, recognizing and interpreting handwritten characters is automated by many researchers. Character recognition has its own importance in the field of Pattern recognition. There are various scripts and languages used in the world. In this modern era, computers are used widely in communication, education, etc. The task of recognition specially, character recognition looks like very simple for human beings [1]. During the study method of handwritten characters recognition, it was found that the human brain is the best system to investigate and models of one that has been very successful in such a task. Humans learn these things from

childhood. For humans, it is necessary to study the objects and save characteristics or features of that object. The same task is very complex for the machine. In addition to the image quality, image characteristics, segmentation, and recognition errors. The complexity of the image also affects the level of recognition of handwritten characters. [2,3]. The role of Devanagari character recognition is complicated by the existence of multi-loops, conjunctions, up and down modifiers and the number of separated and multi-stroke characters in a word, and also some authors use the header row. For example, OCR system will be used to store, search, and experts from paper-based documents [4]. The area of character recognition can be sort the postal document, verifying the cheque in banks, analyzing bank documents, recognition of signature, recognition of vehicle nameplate, crime detection using handwriting.

An article which is based on the topic of character recognition in the handwritten type. We evaluate the performance of different functions based on the classification of SVM. It is shown that the performance of the proposed method can be far superior to that of commercial OCR systems, using as few as 18 training images. Therefore, the process can benefit from unnaturally developed training data avoiding the need to collect and compile expensive data.

II. ANALYSIS OF RELATED WORK

There are several languages in India, so it called a multilingual country. In India there are 1,652 languages and the 350 languages are the main languages [5,6]. In this most of the languages become to the Dravidian and Aryan families. The English and Hindi languages are officially used in the India's Republic. In India, Hindi is the familiar language. Constitution of India recognized 22 languages [7]. Hindi is main among them speak Hindi nearly 41% of people.

I. K. Sethi et.al., published the earliest study report on the Devanagari handwritten characters [8], but not a lot of research work is done after. Presently there are some researchers functioning on Devanagari handwritten characters. This is a very popular script. The nature and phonetic writing system for the script maps the sound of

aksharas to specific forms. Devanagari script is most useful and it is used in to construct many Indian languages like Marathi, Hindi, Sanskrit, Sindhi, Nepali, Konkani, etc. A very wide use Devanagari script in the world so that more than three hundred million people worldwide use the Devanagari [9]. The script is very common and established the base of the Indian language. It plays a crucial role in the development of manuscripts and literature.

Rajneesh Rani et. al., discussed source for feature extraction is the gradient representation. Support Vector Machines (SVM) classifier is obtained the experimental results. The experimental result demonstrates high performance of these features by means of cross validation accuracy of 94% [12].

V.S. Tapkir et.al., projected an algorithm which was based on projection profile. Methods based on profiles can only be segments of line and character without overlap. The experimental result obtained accuracy with 98% [13].

Ved Prakash Agnihotri, used neural network to present a system. Extraction of diagonal-based features is used for Devanagari script handwritten. The Devanagari offline recognition system's accuracy is 85.78 percent [14].

Pratibha Singh et. al., suggested stochastic gradient based learning mini-batch applied to multilayer perceptron. This technique reduces the variance in the estimate of the Gradient [15].

R Jayadevan and so on. Al. [16] proposed a recognition technique that combines two approaches. In addition to the technique of binary vector machine (BMV), the first solution which is based on a gradient structure and the cavity (GSC) functions. The second approach is based on the functionality of the temporal change of the dynamic (DTV) and vertical projection profile (VPP).

III. PROPOSED SYSTEM

The basic task starts with the preparation of the database in the proposed system. Database preparation is an important task in this research work, as there is no standard handwritten database of Rajasthani characters. The character set of Rajasthani is given in Fig.1.

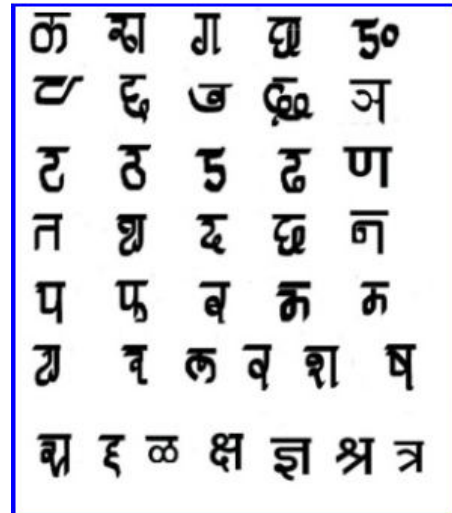


Fig.1: Basic set of characters

a. Database Design

The A4 paper data sheet is intended for the handwritten framework of character recognition and the characters were written by different age groups of different Rajasthani persons. The sample datasheet for data collection is shown in the Fig. 2 and data sheet with handwritten character क is shown in Fig. 3.

Handwritten Rajasthani Character Dataset		Age		Mother Tongue	
Gender	Male / Female	Age	Age	Mother	Tongue
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Fig. 2: Blank data sheet for data collection

Handwritten Rajasthani Character Dataset
Gender: Male / Female Age: 52+ Mother Tongue: Rajasthani

1	2	3	4	5	6	7	8	9	10
1	क	क	क	क	क	क	क	क	क
2	क	क	क	क	क	क	क	क	क
3	क	क	क	क	क	क	क	क	क
4	क	क	क	क	क	क	क	क	क
5	क	क	क	क	क	क	क	क	क
6	क	क	क	क	क	क	क	क	क
7	क	क	क	क	क	क	क	क	क
8	क	क	क	क	क	क	क	क	क
9	क	क	क	क	क	क	क	क	क
10	क	क	क	क	क	क	क	क	क
11	क	क	क	क	क	क	क	क	क
12	क	क	क	क	क	क	क	क	क
13	क	क	क	क	क	क	क	क	क
14	क	क	क	क	क	क	क	क	क
15	क	क	क	क	क	क	क	क	क
16	क	क	क	क	क	क	क	क	क
17	क	क	क	क	क	क	क	क	क
18	क	क	क	क	क	क	क	क	क
19	क	क	क	क	क	क	क	क	क
20	क	क	क	क	क	क	क	क	क

Fig.3: Data sheet with sample data collected

Using the Cannon Lide 110 with 300dpi, data collection from different personal data sheets is scanned and stored as a jpg file after data collection. The approach suggested was to design a database of 18 characters out of 38 characters. The database includes 900 sample datasets in all. The following steps have been performed in order to preprocess the image before feature extraction:

- Phase 1: Read the File for the Datasheet (Scan file)
 - Phase 2: Adjustment of the image intensity value
 - Phase 3: Images have been converted and saved to the grey image scale
 - Phase 4: Converting all grey images to binary images
 - Phase 5: Take this Data File Compliment
 - Phase 6: Crop each line and each character afterwards.
 - Phase 7: Lastly, all images are resized to 40 x 40 pixels.
- In this way the individual characters is available in the form of image in database. Some sample characters in the database are as shown in the Fig. 4.

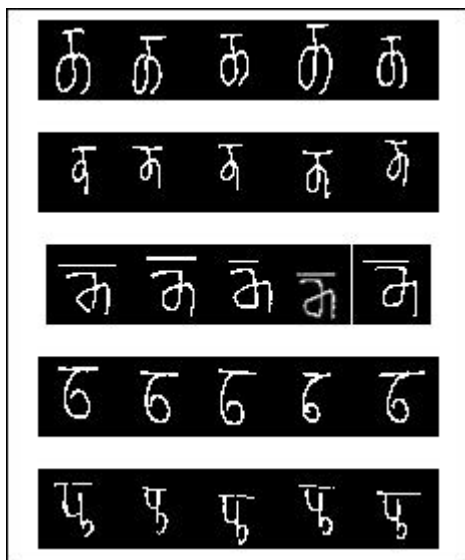


Fig. 4: Sample of database

IV. RESULTS AND DISCUSSION

Features of Histogram-oriented gradients are extracted. The shape of the image with the intensity distribution gradient or towards the edges is represented by HOG features. A local type of an entity is a HOG function vector. The geometric and photometric transformations locally are relatively invariant to the HOG characteristics. That features encode information local shape of the area or the location of a point in an image. In all 81 features are extracted for each character image. In this way the total database contains 900 X 81 data values.

These features are classified using the classifier SVM and results for training, testing and cross validation are shown in Table1, 2 and 3 respectively.

Table 1: For Training		Table 2: For Testing		Table 3: For Cross Validation	
Characters	% of Accuracy	Characters	% of Accuracy	Characters	% of Accuracy
Ka क	100	Ka क	100	Ka क	100
Wa क	100	Wa क	90.00	Wa क	72.73
Fa फ	100	Fa फ	78.57	Fa फ	88.89
Ga ग	100	Ga ग	100	Ga ग	88.89
Gha घ	100	Gha घ	90.00	Gha घ	63.64
bha भ	100	bha भ	100	bha भ	100
ba ब	100	ba ब	92.31	ba ब	100
Sha श	100	Sha श	93.33	Sha श	66.67
Ee ळ	100	Ee ळ	70.59	Ee ळ	57.14
Tra ऎ	100	Tra ऎ	92.86	Tra ऎ	100
Ha ह	100	Ha ह	100	Ha ह	62.50
Eee ऄ	100	Eee ऄ	83.33	Eee ऄ	87.50
Naa ऑ	100	Naa ऑ	100	Naa ऑ	71.43

ज्ञ	100	ज्ञ	75.00	ज्ञ	71.43
Na	100	Na	84.62	Na	100
अ	100	अ	66.67	अ	100
त	100	त	71.43	त	75
ए	100	ए	84.62	ए	71.43

Table 4: Average Accuracy

Classifier	Training	Cross-validation	Testing	Average Accuracy
SVM	100	82.06	87.40	89.82

The classifier used in this work is *SVM*. On training, testing, and cross validation, these results are carried out. Here to be note that on training set the percentage of accuracy almost 100% for all characters, on testing set the average percentage of accuracy is 87.40% and the average percentage of accuracy is 82.06% for cross validation. On testing the recognition rate above 90% is recognition rate is 66.67% for ‘Sa’. The average recognition rate is obtained 89.82%. This accuracy can be improved by taking into account a bigger collection of data when training a classifier. This work can also be extended with offline handwriting character for character recognition other scripts in India. The graphical representation of the obtained result for each character on testing and cross validation is shown in the Fig. 5.

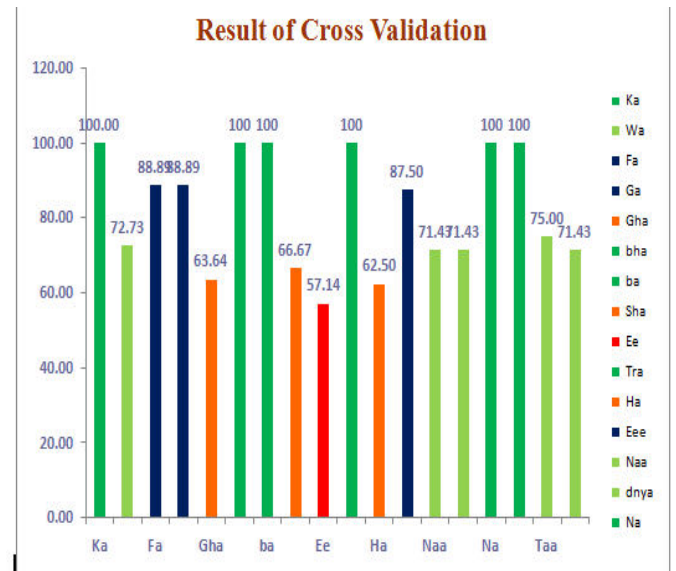
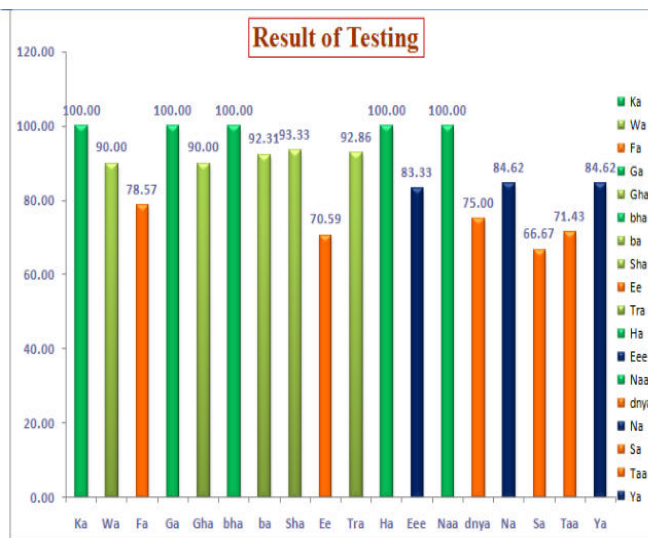


Fig.5: Recognition accuracy with SVM classifier

V. CONCLUSION

Authors propose a handwritten Rajasthani character recognition algorithm. The average accuracy of recognition in preparation, testing and CV using SVM for all handwritten Rajasthani characters is 89.82%. By taking into account a larger collection of data when training a classifier, this accuracy can be improved. This work can also be extended to other character recognition scripts in India.

ACKNOWLEDGMENT

The authors would like to thank Amravati University, Amravati for their support in the completion of this research work.

REFERENCES

- [1] Ajmire P. E., Dharaskar R V, Thakare V M, “Handwritten Devanagari (Marathi) Character Recognition Using SVM And MLP”, International Journal Of Pure And Applied Research In Engineering And Technology, IJPRET, Volume 4 (4): 1-10, 2015.
- [2] Amalia Rusu and Venu Govindaraju, “The Influence of Image Complexity on Handwriting Recognition”, University at Buffalo, the State University of New York Buffalo, NY, USA.
- [3] Ajmire P. E., Dharaskar R V, Thakare V M, “Study of Complexity of Devanagari Script for Handwritten Character Recognition”, Proceedings of Twelth IRF International Conference, Chennai, India, pp.109-111, 31st August 2014.
- [4] Simone Marinai, “Introduction to Document Analysis and Recognition”, Springer-Verlag Berlin Heidelberg 2008.
- [5] Nandita Chaudhary, “Listening To Culture: Constructing Reality from Everyday Talk”, SAGE Publications India.
- [6] E-Book “Discovering the Life Span”, by Pearson Education India.
- [7] R. Mahesh K. Sinha, “A Journey from Indian Scripts Processing to Indian Language Processing”, IEEE Annals of the History of Computing, IEEE Computer Society, 2009.
- [8] I.K. Sethi, B. Chatterjee, “Machine recognition of constrained hand printed Devanagari”, Pattern Recognition, the Journal of the Pattern Recognition Society, Vol. 9, Issue 2, pp 69-75, July 1977.
- [9] Latesh Malik and P. S. Deshpande, “Recognition of printed Devnagari characters with regular expression in finite state models”, Proceedings of the International Workshop on Machine Intelligence Research (MIR Day, GHRCE- Nagpur), 2009.
- [10] Sandhya Arora, D. Bhattacharjee, M. Nasipuri, D. K. Basu and M. Kundra, “Complementary Features Combined in a MLP-based System to Recognize Handwritten Devanagari Characters”

Journal of Information Hiding and Multimedia Signal Processing
Vol. 2, No. 1 Jan 2011.

- [11] J. Pradeep, E. Srinivasan and S. Himavathi “Diagonal Based Feature Extraction for Handwritten Alphabets Recognition System Using Neural Network”, International Journal of Computer Science & Information Technology, Vol. 3, No 1, Feb 2011.
- [12] Ashutosh Aggarwal, Rajneesh Rani, Renu Dhir “Handwritten Devanagari Character Recognition Using Gradient Features”, International Journal of Advanced Research in Computer Science and Software Engineering, Volume 2, Issue 5, May 2012.
- [13] Mrs. V S Tapkir and Mrs.S D Shelke, “OCR for handwritten Marathi Script”, International Journal of Scientific & Engineering Research Vol. 3, Issue 8, August 2012.
- [14] Ved Prakash Agnihotri, “Offline Handwritten Devanagari Script Recognition”, Information Technology and Computer Science, Vol. 8, pp. 37-42, 2012.
- [15] Pratibha Singh, Ajay Verma and Narendra S Chaudhari, “Handwritten Devanagari Digit Recognition using Fusion of Global and Local Features”, International Journal of Computer Application, Vol.89, Number-1, 2014.
- [16] R Jayadevan, S R Kolhe, P M Patil and U Pal “Database Development and Recognition of Handwritten Devanagari Legal Amount words”, International Conference on Document Analysis and Recognition, IEEE, 2011.

An overview of information extraction methods, techniques and tools for the contents in chemical document

Agarkar VV¹ and Ajmire PE²

¹Assistant Professor, Department of Computer Science, Shri D. M. Burungale Science & Arts College, Shegaon MS, India,

²Professor & Head, Department of Computer Science, G. S. Science Arts & Commerce College, Khamgaon MS, India,

Email: vinodvagarkar@gmail.com, peajmire@rediffmail.com

Manuscript details:

Available online on <http://www.ijlsci.in>

ISSN: 2320-964X (Online)

ISSN: 2320-7817 (Print)

Cite this article as:

Agarkar VV and Ajmire PE (2021) An overview of information extraction methods, techniques and tools for the contents in chemical document, *Int. J. of. Life Sciences*, Special Issue, A16: 26-30.

Article published in Special issue of National Conference on "Recent Trends in Science and Technology-2021 (RTST-2021)" organized by Department of Environmental Science, Shri. Dnyaneshwar Maskuji Burungale Science & Arts College, Shegaon, Bhuldhana, and Department of Botany Indraraj Commerce and Science College Shillod, Dist. Aurangabad, Maharashtra, India date, February 22, 2021.



Open Access This article is licensed under a Creative Commons Attribution 4.0

International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other thirdparty material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>

ABSTRACT

The amount of electronic documents has speedily increased and the information over the internet is increasing day by day too. The web is continuously growing because the new information is added over it a day. These massive documents contain substantial information, but it has to be retrieved and managed in a constructive and useful way. Extracting the information from these documents is useful for many applications such as text categorization, summarization, clustering, topic tracking etc. Information Extraction (IE) is the field of extracting useful information using different methods and approaches. In this paper, the concept of information extraction (IE) is discussed, as well as presents overview of techniques used for information extraction from chemical documents.

Keywords - Information Extraction, NLP, ChemEx, IR

INTRODUCTION

The World Wide Web is the largest, popular and most widely used information source. It is much popular among users because it can easily accessible and searchable. The information over the internet is increasing day by day. The web is continuously growing because the new information is added over it a day, due to the web, users not only allow to look needed information on the web, but also easily share the information and knowledge with others (Agarkar *et al.*, 2020). The information available on the web is in the form of web pages. The contents of web pages may include texts, images, audios, videos, links, lists, charts, tables etc. Analyzing such data can help to extract meaningful information from web. In fast moving academic world, new conferences, journals and other publications are rapidly comes into existence and are expanding the already vast repository of scientific knowledge (Patil and Mahajan, 2012). E-Journals are an important source for the scientific research and development. Researchers and other users are widely used to carry out day-to-day qualitative research, education and knowledge.

Scientific documents are the main source of current information for researchers. Usually, this textual data is available either in semi-structured or unstructured form. Today most of the scientific documents are available in Portable Document Format (PDF). Extracting the Knowledge from these documents is beneficial for several applications like text categorization, summarization, clustering, topic tracking etc. Information extraction (IE) is the task of automatically extracting structured information from unstructured and/or semi-structured machine-readable documents and other electronically represented sources. In past decades, IE system development has grown rapidly; gaining attention from a lot of researchers. Information extraction tools make it possible to pull information from text documents, databases, websites or multiple sources. Usually, however, IE is used in natural language processing (NLP) to extract structured from unstructured text. IE systems are developed to extract information from differing types of text such as unstructured, semi-structured and structured text. The differences between the three types of text documents are:

Unstructured data

According to Sint *et al.* (2009) unstructured data (or unstructured information) refers to information that either does not have a predefined data model or does not fit into relational tables. Unstructured information is typically text-heavy, but may contain data such as dates, numbers, and facts as well. This result in irregularities and ambiguities that make it difficult to understand using traditional computer programs as compared to data stored in fielded form in databases or annotated in documents.

Semi-structured data

The term semi-structured data is a form of structured data that does not conform to the formal structure of data models associated with relational databases or other forms of data tables, but nonetheless contains tags or other markers to separate semantic elements and enforce hierarchies of records and fields within the data (Sukanya and Biruntha, 2012).

Structured text data:

Structured data includes mainly text, these data are easily processed. These data are easily entered, stored and analyzed. Structured data are stored in the form of rows

and columns which is easily managed with the language called "structured query language" (SQL). Relational model is a data model that supports structured data and manages it in the form of row and table and process the content of the table easily. XML also Support structured data. Most of the content of the web pages are in the XML forms (Praveen and Chandra, 2017).

This paper discusses some important aspects of IE concepts, together with the methods, techniques and tools which are used to extract information from chemical documents.

Information Extraction

Information Extraction (IE) is a process that analyses natural language in order to extract specific data. The process takes texts (and sometimes speech) as input and produces fixed-format, unambiguous data as output. This data may be used directly for display to users, or may be stored in a database or spreadsheet for later analysis, or may be used for indexing purposes in Information Retrieval (IR) applications such as Internet search engines like Google search engine (Cunningham, 2006). Early work in information extraction from documents is based on two major machine learning techniques. The first is Hidden Markov models (HMM) and second is Support Vector Machine (SVM).

Information extraction is an important research area, and many research efforts have been made so far. Among these research work, rule learning based method, classification -based method, and sequential labeling based method are the three state-of-the-art methods (Jie *et al.*, 2007).

1) Rule Learning based Extraction Methods

Numerous information systems have been developed based on this method, which can be grouped into three categories: dictionary-based method, rule-based method, and wrapper induction.

a) Dictionary based method

Traditional information extraction systems first construct a pattern (template) dictionary, and then use the dictionary to extract needed information from the new untagged text. These extraction systems are called as dictionary-based systems (also called pattern-based systems).

b) Rule based method

The rule based method use several general rules instead of dictionary to extract information from text. The rule based systems have been mostly used in information extraction from semi-structured web page. Two main rule learning algorithms of these systems are: bottom-up method which learns rules from special cases to general ones, and top-down method which learns rules from general cases to special ones.

c) Wrapper induction

Wrapper induction is another type of rule based method which is aimed at structured and semi-structured documents such as web pages. A wrapper is an extraction procedure, which consists of a set extraction rules and also program codes required to apply these rules. Wrapper induction is a technique for automatically learning the wrappers. Given a training data set, the induction algorithm learns a wrapper for extracting the target information (Jie *et al.*, 2007).

2) Classification based method

In this method, information extraction is done using supervised machine learning approach. The basic idea is to cast information extraction problem as that of classification. Support Vector Machines (SVMs) is one of the most popular methods for classification (Jie *et al.*, 2007).

3) Sequential labeling based method

Information extraction can be cast as a task of sequential labeling. In sequential labeling, a document is viewed as a sequence of tokens, and a sequence of labels are assigned to each token to indicate the property of the token. For example, consider the nature language processing task of labeling words of a sentence with their corresponding Part-Of-Speech (POS). In this task, each word is labeled with a tag indicating its appropriate POS. Hidden Markov Model, Maximum Entropy Markov Model, and Conditional Random Field are widely used sequential labeling models (Jie *et al.*, 2007).

Table 1: Comparison of some chemical related IE methods for information extraction

Approach used	Dataset tested	Extracted Information	Reference
Lexical and syntactic aspects	American Chemical Society journals	Facts about chemical reactions	Zamora and Blower (1984)
nearest neighbour KNN	300 datasets	Protein names form biological information	Mani and I Zhang (2003)
NLP	Free-text documents in a patients (EMR) Electronic Health Record	potential medical problems	Meystre and Haug (2006)
Searching with key Words and Dictionary based Systems	Scientific Literature from web	Protein	Ono <i>et al.</i> , (2001)
Rule-based IE system	Hospital records of diabetic Patients and Reports	Useful information from Polish medical texts	Mykowiecka <i>et al.</i> , (2009)
Hybrid approach that combines a Conditional Random Field (CRF) with a dictionary	any natural language texts and documents of bioinformatics	Identifying chemical names that are mentioned in natural language texts	Rocktaschel <i>et al.</i> , (2012)

Applications of IE

There are several applications of IE, such as news extraction, literature extraction, text extraction, pharmaceutical, healthcare, bioinformatics, and so forth. The development happens in Natural Language Processing and its applications increase so as to involve the extraction methods in different areas. In the areas of chemical, biomedical and other related areas, a lot of IE methods have been developed (Elsadig *et al.*, 2015). Some of well-known applications are discussed here:

IE Methods and Techniques for Chemical Documents

Recently, the method of automatically extracting knowledge and information from text data has become one of the most relevant and active fields of study. In this regards, particularly the IE techniques used to extract information from chemical and biomedical literature. The common documents that contain chemical information are Journal Literature and Conference Papers, Reports, Dissertations, Books, Research papers, patents, drug description, scientific articles, online articles, and so forth. Many IE techniques including various tools and methods have been developed for chemical document domain. Following table Table-1 shows some of the IE methods that are proposed for information extraction from chemical and related domain. This table contains four columns namely; author, approach used, dataset tested, extracted information and references.

Tools for information extraction in Chemical Documents

Following are some of the important tools that are used for information extraction from chemical documents:

1) TICA

TICA (Postma *et al.*, 1990) is a program for the analysis of short texts, such as abstracts. It is particularly used for the extraction of factual and methodological data from abstract-like texts on analytical chemical methods. The system consists of a parser/interpreter (which performs a parallel analysis based on requests) and a frame-based reasoning system (script-applier). This program is capable of analyzing short abstract-like texts containing declarative and imperative simple sentences and complex sentences with participle clauses. Inorganic substance names are translated to their formulas and the program can handle various kinds of quantifiers.

2) Chem Data Extractor

Matthew and Jacqueline (2016) presented a complete toolkit ChemDataExtractor for the automated extraction of chemical entities and their associated properties, measurements, and relationships from scientific documents that can be used to populate structured chemical databases. This system provides an extensible, chemistry-aware natural language processing pipeline for tokenization, part-of-speech tagging, named entity recognition and phrase parsing. This toolkit uses of unsupervised word clustering based on a massive corpus of chemistry articles to improve the performance for chemical named entity recognition. Also for phrase parsing and information extraction, the multiple rule-based grammars are used in this toolkit. They also described document-level processing to resolve data interdependencies, and show that this is particularly necessary for the auto-generation of chemical databases since captions and tables commonly contain chemical identifiers and references that are defined elsewhere in the text. The performance of the toolkit to correctly extract various types of data was evaluated, affording an F-score of 93.4%, 86.8% and 91.5% for extracting chemical identifiers, spectroscopic attributes, and chemical property attributes, respectively. All tools have been released under the MIT license and are available to download.

3) Chem Ex

Tharatipyakul *et al.* (2012) have developed ChemEx, a chemical information extraction system. ChemEx processes both text and images in publications. Text annotator is able to extract compound, organism, and assay entities from text content while structure image recognition enables translation of chemical raster images to machine readable format. A user can view annotated text along with summarized information of compounds, organism that produces those compounds, and assay tests. ChemEx facilitates and speeds up chemical data curation by extracting compounds, organisms, and assays from a large collection of publications. This software and corpus can be downloaded from web.

CONCLUSIONS

This paper discusses some of the important extraction methods, techniques and tools that are proposed for medication and chemical documents. Various researchers

extracted information by analyzing natural text, and extracted information like chemical names, facts, potential medical problems, structured medication information, protein information etc from scientific documents or reports with good accuracy. Extraction approaches are based on traditional machine learning techniques, rule based algorithm, hybrid techniques and some newly applied techniques. The automation process of IE needs to be implemented in different domains. Numerous methods and techniques are being proposed in the IE field to automate these processes.

Conflicts of interest: The authors stated that no conflicts of interest.

REFERENCES

- Agarkar VV, Ajmire PE, Bodkhe PS (2020) "Web Mining: An Application of Data Mining", Aayushi International Interdisciplinary Research Journal, Special Issue No.66, pp 56-59.
- Atima Tharatipyakul, Somrak Numnark, Duangdao Wichadakul, Supawadee Ingsriswang (2012) ChemEx: information extraction system for chemical data curation", From Asia Pacific Bioinformatics Network (APBioNet) Eleventh International Conference on Bioinformatics, (InCoB2012), Bangkok, Thailand.
- Cunningham H (2006) Information Extraction, Automatic", Encyclopaedia of Language and Linguistics, 2nd Edition, 5:665-677.
- Elsadig Muawia, Ahmed Ali & Himmat, Mubatak (2015) "Information Extraction methods and extraction techniques in the chemical document's contents: Survey", ARPN Journal of Engineering and Applied Sciences. 10. 1068-1073.
- Jie Tang, Mingcai Hong, Duo Zhang, Bangyong Liang, and Juanzi Li, (2007) "Information Extraction: Methodologies and Applications", Emerging Technologies of Text Mining: Techniques and Applications. 10.4018/978-1-59904-373-9.ch001.
- Mani. and I Zhang. (2003), "kNN approach to unbalanced data distributions: a case study involving information extraction," in Proceedings of Workshop on Learning from Imbalanced Datasets, 2003.
- Meystre S and Haug PJ (2006), "Natural language processing to extract medical problems from electronic clinical documents: performance evaluation," Journal of biomedical informatics, vol. 39, pp. 589-599.
- Mykowiecka, M. Marciniak, and A. Kupsc. (2009), "Rule-based information extraction from patients' clinical data," Journal of biomedical informatics, vol. 42, pp. 923-936.
- Ono T, Hishigaki H, A. Tanigami, and T Takagi (2001) "Automated extraction of information on protein-protein interactions from the biological literature," Bioinformatics, vol. 17, pp. 155-161, 2001.
- Patil SR and Mahajan SM (2012) Optimized summarization of research papers as an aid for research scholars using data mining techniques", International Conference on Radar, Communication and Computing (ICRCC), IEEE, pp 243 - 249.
- Postma GJ, van der Linden B, Smits JR, Kateman G (1990) TICA: A System for the Extraction of Data from Analytical Chemical Text. Chemometrics and Intelligent Laboratory Systems 9, 65-74.
- Praveen Shagufta and Chandra Umesh. (2017), "Influence of Structured, SemiStructured, Unstructured data on various data models", International Journal of Scientific & Engineering Research Volume 8, Issue 12.
- Rocktaschel T, M. Weidlich, and U. Leser.(2012), "ChemSpot: a hybrid system for chemical named entity recognition," Bioinformatics, vol. 28, pp. 1633-1640, 2012.
- Sint R, Shaffert S, Stroka S and Ferstl R, (2009) Combining unstructured, fully structured and semi-structured information in semantic wikis", Paper presented at the Semantic Wikis.
- Sukanya M and Biruntha S (2012), "Techniques on Text Mining", IEEE International Conference on Advanced Communication Control and Computing Technologies (ICACCCT), pp: 269-271.
- Swain Matthew C and Cole Jacqueline M (2016), "ChemDataExtractor: A Toolkit for Automated Extraction of Chemical Information from the Scientific Literature", J. Chem. Inf. Model. 56, 1894-1904.
- Zamora EM and Blower Jr PE.(1984), "Extraction of chemical reaction information from primary journal text using computational linguistics techniques. 1. Lexical and syntactic phases," Journal of chemical information and computer sciences, vol. 24, pp. 176- 181, 1984.

© 2021 | Published by IJLSCI

Submit your manuscript to a IJLSCI journal and benefit from:

- ✓ Convenient online submission
- ✓ Rigorous peer review
- ✓ Immediate publication on acceptance
- ✓ Open access: articles freely available online
- ✓ High visibility within the field

Submit your next manuscript to IJLSCI through our manuscript management system uploading at the menu "Make a Submission" on journal website

Email your next manuscript to IRJSE editor@ijlsci.in

Impact Factor-8.575 (SJIF)

ISSN-2278-9308

B.Aadhar

Peer-Reviewed & Refreed Indexed

Multidisciplinary International Research Journal

February -2022

(CCCXXXVIII) 338



Chief Editor

Prof. Virag S. Gawande

Director

Aadhar Social

Research & Development
Training Institute Amravati

Editor:

Dr.Dinesh W.Nichit

Principal

Sant Gadge Maharaj
Art's Comm,Sci Collage,
Walgaon.Dist. Amravati.

Executive Editor:

Dr.Sanjay J. Kothari

Head, Deptt. of Economics,
G.S.Tompe Arts Comm,Sci Collage
Chandur Bazar Dist. Amravati



This Journal is indexed in :

- Scientific Journal Impact Factor (SJIF)
- Cosmos Impact Factor (CIF)
- International Impact Factor Services (IIFS)

For Details Visit-To : www.aadharsocial.com

Aadhar PUBLICATIONS



INDEX

No.	Title of the Paper	Authors' Name	Page No.
1	Christianity In India: The Early Period And Vasco Da Gama	Anjali Andrey	1
2	The Facets Of Constitutionalism And Present Political Scenario In India: An Analysis	Dr.K B Chaurpagar	5
3	A brief study of historical review of Indian Ethics	Dr. (Mrs.) Seema Deshpande	8
4	Role of ICT in Management Education - Enhancing Quality of Education and A Better Conduit of Learning	Dr. Anita Sable	11
5	The Growing Interoperable Dimensions in Knowledge Society	Dr. Dhananjay W. Deote / Dr. Pramod A. Wadate	21
6	Buying behaviour of students towards toothpaste: A study on western vidarbha	Dr. M. S. Galkwad & Miss. Shraddha D. Rathi	30
7	Silence! The Court is in Session: An Exhibition of Marxism	Dr. Manohar A. Wasnik	35
8	Factors Affecting Higher Education Of Minority Students	Dr. Najma Begum/ Asma	38
9	Bitcoin And Cryptocurrency : Challenges And Opportunities	Dr. Patil Bhagwan Shankar	42
10	The Process of Entrepreneurship	Dr. Rajesh M. Deshmukh	48
11	Effect of Pranayama and Suryanamaskar on Lung Capacity of College Students	Dr. Sanjay V. Deshmukh	51
12	Agricultural Marketing Impact of Covid-19	Dr. Suresh G. Sonawane	54
13	Women Empowerment for Nation's Development	Dr. Tanka Prasad Upadhyaya	58
14	Feminism in English literature: An overview	Dr.Dadarao.K.Upase	63
15	South Travancore Before The Emergence Of Venad	Dr.Sajeey Singh.M.K.	66
16	An overview of Mobilization of resources and its transition towards development of Indianeconomy	Dr.V.A.Pawale / Mr. Narendra Balbhim Mudiraj	70
17	Digital Libraries: An Overview	Jagadish T Patange	73
18	Title:Challenges Before Indian Democracy	Dr. More Nayanath Bhagawan	76
19	Cryptocurrency : Impact On Indian Economy	Dr. Sou. Parvati Bhagwan Patil	79
20	The Importance Of Computers In Research	Prof. Rajesh B. Tandekar	85
21	Impact of E-commerce on Textile industry	Kashish Sandeep Mehra	89
22	India China Border Issues(Dispute)	Dr.Prashant Diwakar Satpute	93



Buying behaviour of students towards toothpaste:

A study on western vidarbha

Dr. M. S. Gaikwad & Miss. Shraddha D. Rathi

Department of Commerce, G. S. Science, Arts & Commerce College,
Khamgaon ,District - Buldana

Abstract

Toothpaste industry is a big market in India. Toothpastes form an important item in the monthly grocery shopping of most of the urban households. In earlier times, consumers especially in India relied on using the traditional substances like Neem twigs or Mishri (Tobacco containing teeth cleaning powder) for keeping their teeth clean and healthy. But slowly international brands started replacing the older methods of maintaining oral hygiene. Earlier consumers were negligent of their oral hygiene and even didn't care to see a dentist for their oral health problems. However, the trend is changing and now a day's dental advice is also considered an important factor while making a purchase decision of the toothpaste brand, at least in urban markets. Today's consumer has a wide variety of choice in terms of tooth paste brands. Toothpastes from paste form, to gel and powder form are present in the market catering to needs of all the segments.

Also, a lot of herbal and medicated toothpastes having natural and anti-sensitivity properties are creating niches for themselves in the market space. This descriptive study mainly focuses on understanding the external factors like demographic, social, product attributes and other external influencers which impact consumer decision making process for buying toothpaste. The method adopted for conducting survey is questionnaire; using non probability convenience sampling technique for gathering information from consumers.

Keywords: Toothpaste, Neem, Consumers, Oral, Purchase, Niches, Demographic

Introduction:

Marketers had long back noted that consumer did not always act or react, as marketing theory would suggest. Consumer behaviour emerged as a stream of management which dealt with the way a consumer goes about making a decision to purchase various products. Selection of an action from two or more alternative choices is termed as a decision. "Consumer purchase decision" involves decision to purchase the goods from the available alternative choice. The various available options to the consumer can be classified into five main types of decisions. They are what to buy, how much to buy, where to buy, when to buy, how to buy. The people who impact the buying decisions may be classified as the initiator, influencer, decider, buyer and users. The size of the consumer market in the country was vast and constantly expanding with 27 millions of dollars being spent on goods and services by millions of people. Consumer preferences are changing and becoming highly diversified. The needs of the consumer which have to be fulfilled, the alternatives existing, the product and brand choices they have and the post buying behaviour of the consumers need to be studied for an effective marketing strategy. The Indian Fast Moving Consumer Goods (FMCG) industry began to shape during the last fifty odd years. The FMCG sector is a cornerstone of the Indian economy. This sector touches every aspect of human life. Indian FMCG market has been divided for a long time between the organized sector and the unorganized sector. Unlike the US market for FMCG which is dominated by a handful of global players, India's Rs. 460 billion FMCG market remains highly fragmented with roughly half the market going to unbranded, unpackaged home-made products. This presents a tremendous opportunity for makers of branded products who can convert consumers to buy branded



products. Toothpaste forms a regular item in the grocery shopping list for monthly or bi-monthly purchases; the price forms an important factor. A lot of options are available to the consumers today in terms of the toothpastes brands ranging from different variants of Colgate which is designed to cater to the needs of all the segments from youths to the older generation, Pepsident, Close-up which comes in a gel form used by youngsters to give a long lasting freshness, Anchor which claims itself to be the 1 vegetarian toothpaste, Dabur, which comes in a powder form Sensodyne and other fluoridated toothpastes which are basically used for anti-sensitivity purposes. Urban India is, in itself, on the way to becoming a major world market. Many companies are focusing their activities in India specifically on urban areas because of the greater accessibility of those markets. Thus, urban consumption growth rather than overall growth is, for many companies, the most significant measure of the future Indian consumer opportunity.

According to McKinsey report of 2007, it is expected that urban consumption would accelerate and continue to grow faster than the overall economy, and forecast a compound annual growth of 9.4 percent over the next 20 years. If incomes follow this growth path, then average annual spending per urban Indian household will more than triple from 115,620 Indian rupees annually today to 378,170 Indian rupees in 2025. As household spending rises, the urban market will expand from 7,208 billion Indian rupees (\$158 billion) to 43,120 billion Indian rupees (\$944 billion) by 2025. At that point, the urban Indian market will exceed the size of France's total consumer market today. Apart from dramatic income growth, one of the main drivers of the rising urban market is the rapid growth in urban population. Nearly two-thirds of the total increase in population in India over the next two decades will occur in urban India. In addition, continued internal migration into urban areas will mean that the share of the country's population in urban areas will rise from 29 percent today to 37 percent in 2025. The combination of births and migration will raise the urban population from 318 million today to 523 million by 2025. Urban India today is already more populous than the entire United States; by 2025, it will exceed the current population of the EU. Rich urban households in India will have spending habits similar to those of their developed-country counterparts—branded apparel, vacations abroad, electronics, and cars will all be high-priority purchases. Finally, another attractive aspect of this target segment will be its geographical concentration. Today 60 percent of urban global households live in the top eight cities of the country (Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad, Ahmadabad and Pune), making them a relatively more visible and easily targeted segment than the other income bands. Consumers in India are set to drive growth, thanks to rising awareness of the importance of oral hygiene and improving income levels. Consumers are switching from traditional, homemade solutions such as datum, mishri and neem leaves to using toothbrushes and toothpaste.

Objectives:

- a) To study the factors that influences the buyers to buy different toothpaste(s).
- b) To examine the brand awareness for various brands and the attributes and influencers impacting purchase decision.
- c) To study the impact of consumer promotions and factors influencing switching behaviour.

Literature review:

Consumer Personality Factors There is two factors mainly influencing the consumers for decision making: Risk aversion and innovativeness. Risk aversion is a measure of how much consumers need to be certain and sure of what they are purchasing (Donthu and Gilliland, 1996). Highly risk adverse consumers need to be very certain about what they are buying. Whereas less risk adverse consumers can tolerate some risk and uncertainty in their purchases. The second variable, innovativeness, is a global measure which captures the degree to which consumers are willing to



toothpaste to consumers. Celebrity endorsement was the most impactful mode of attracting consumers to buy or try a toothpaste brand. Advertisement, sales promotion and recommendations of professional bodies are other marketing elements which impact toothpaste buying. Pricing in spite of being an important marketing mix, is not a major selection criterion in western vidarbha.

The data was meant for capturing information on switching behaviour and reasons for change of existing brand. Promotional offers and retailer influence was the main reason for switching behaviour seen for change in toothpaste brand. Advertisement and vegetarian toothpaste was other reasons for change in brands. Price rise, switching brands occasionally and short supply were the least preferred reasons for change of brands.

Limitations of Study:

The limitation contained in the primary data was that of limited sample size used for study, thus sample cannot be correct representation of the target. Moreover, consumer buying is a complex process in which number of factors like economic factors, social status and psychographic factors influence the buying of the consumer, those are not considered for the study.

Conclusion:

It is very difficult to predict consumer behaviour. Consumer research can to some extent solve this problem. Normally, companies concentrate on only analysing the requirements of consumers and also strategies to retain them. This study was conducted to understand behaviour and motives of consumers in India for buying toothpaste. There is a huge potential for Oral care market in India as penetration and per capita consumption of oral care product is very low. With rising per capita income and better awareness there is an increasing demand seen for oral care products. Many people in India still clean their teeth with traditional products like Neem twigs, salt, ash, tobacco or other traditional substances. The average all India per capita consumption of toothpaste stands at dismal 82gms. The dentist to population ratio is an abysmally low at 1:35000 in the country. All this has contributed to low oral hygiene consciousness and widespread dental diseases. Less than 15% of the Indian toothpaste users brush twice a day. Government of India has taken initiatives like conducting dental health camps for promoting the product consumption and creating awareness among common people on benefits of maintaining oral hygiene.

Therefore, companies need to analyse all these factors and find out the best suitable tools and cultural orientations for promoting their toothpaste brands in India. After economic liberalization of 1990s, Indian markets have borne witness to dramatic shifts in the structures triggered by sharp changes in the lifestyle patterns impacted by technology. Time tested concepts like mass marketing and brand loyalty, are being tested as they fail to gauge the behaviour of new generation customers. The behaviour has been characterized by the uniqueness of individual expectations, preference for multiple options, increasing propensity to abandon loyalty and switch to competitive brands that have higher (perceived) value. The new generation consumers don't mind buying imported products that can satisfy their specific requirement. In such a scenario, it has become difficult to classify the consumers by conventional demographic factors. On the other hand, unless their thinking process and buying behaviour are fully understood, decisions on packaging and product designs, branding and distribution channels are likely to be misplaced.

Bibliography Journals and Books:

1. Assunção, J.L., and Meyer, J.R., (1993): The Rational Effect of Price Promotions on sales and Consumption, *Management Science*, 39(5): 517-535.
2. Bawa, K., and Shoemaker. (1987): The Coupon-Prone Consumer: Some Findings Based on Purchase Behaviour across Product Classes, *Journal of Marketing*, 51(4), 99-110. Bell,

B.Aadhar' International Peer-Reviewed Indexed Research Journal



Impact Factor -(SJIF) -3.575, Issue NO, 338 (CCXXXVIII)

100%
2024
B.Aadhar
2022

3. D.R., Chiang, J., and Padmanabhan, D. (1999): The Decomposition of Promotion and Marketing Science, 18 (4): 504-526.
4. Behura, KC and Panda, JK, (2012): VSRD International Journal of Business Management research, vol2 (2):65-74.
5. Daly, and Ellen. (1993): Advertising impact: Using the power of promotional gifts, The American Salesman, 38 (10):16.

Impact Factor-8.575 (SJIF)

ISSN-2278-9308

B.Aadhar

Peer-Reviewed & Refreed Indexed

Multidisciplinary International Research Journal

February -2022

(CCCXXXVIII) 338



Chief Editor

Prof. Virag S. Gawande

Director

Aadhar Social

**Research & Development
Training Institute Amravati**

Editor:

Dr.Dinesh W.Nichit

Principal

**Sant Gadge Maharaj
Art's Comm,Sci Collage,
Walgaon.Dist. Amravati.**

Executive Editor:

Dr.Sanjay J. Kothari

**Head, Deptt. of Economics,
G.S.Tompe Arts Comm,Sci Collage
Chandur Bazar Dist. Amravati**



This Journal is indexed in :

- Scientific Journal Impact Factor (SJIF)
- Cosmos Impact Factor (CIF)
- International Impact Factor Services (IIFS)

For Details Visit To : www.aadharsocial.com

Aadhar PUBLICATIONS



INDEX

No.	Title of the Paper	Authors' Name	Page No.
1	Christianity In India: The Early Period And Vasco Da Gama	Anjali Andrey	1
2	The Facets Of Constitutionalism And Present Political Scenario In India: An Analysis	Dr.K B Chaurpagar	5
3	A brief study of historical review of Indian Ethics	Dr. (Mrs.) Seema Deshpande	8
4	Role of ICT in Management Education - Enhancing Quality of Education and A Better Conduit of Learning	Dr. Anita Sable	11
5	The Growing Interoperable Dimensions in Knowledge Society	Dr. Dhananjay W. Deote / Dr. Pramod A. Wadate	21
6	Buying behaviour of students towards toothpaste: A study on western vidarbha	Dr. M. S. Galkwad & Miss. Shraddha D. Rathi	30
7	Silence! The Court is in Session: An Exhibition of Marxism	Dr. Manohar A. Wasnik	35
8	Factors Affecting Higher Education Of Minority Students	Dr. Najma Begum/ Asma	38
9	Bitcoin And Cryptocurrency : Challenges And Opportunities	Dr. Patil Bhagwan Shankar	42
10	The Process of Entrepreneurship	Dr. Rajesh M. Deshmukh	48
11	Effect of Pranayama and Suryanamaskar on Lung Capacity of College Students	Dr. Sanjay V. Deshmukh	51
12	Agricultural Marketing Impact of Covid-19	Dr. Suresh G. Sonawane	54
13	Women Empowerment for Nation's Development	Dr. Tanka Prasad Upadhyaya	58
14	Feminism in English literature: An overview	Dr.Dadarao.K.Upase	63
15	South Travancore Before The Emergence Of Venad	Dr.Sajeey Singh.M.K.	66
16	An overview of Mobilization of resources and its transition towards development of Indian economy	Dr.V.A.Pawale / Mr. Narendra Balbhim Mudiraj	70
17	Digital Libraries: An Overview	Jagadish T Patange	73
18	Title:Challenges Before Indian Democracy	Dr. More Nayanath Bhagawan	76
19	Cryptocurrency : Impact On Indian Economy	Dr. Sou. Parvati Bhagwan Patil	79
20	The Importance Of Computers In Research	Prof. Rajesh B. Tandekar	85
21	Impact of E-commerce on Textile industry	Kashish Sandeep Mehra	89
22	India China Border Issues(Dispute)	Dr.Prashant Diwakar Satpute	93



Buying behaviour of students towards toothpaste:

A study on western vidarbha

Dr. M. S. Gaikwad & Miss. Shraddha D. Rathi

Department of Commerce, G. S. Science, Arts & Commerce College,
Khamgaon ,District - Buldana

Abstract

Toothpaste industry is a big market in India. Toothpastes form an important item in the monthly grocery shopping of most of the urban households. In earlier times, consumers especially in India relied on using the traditional substances like Neem twigs or Mishri (Tobacco containing teeth cleaning powder) for keeping their teeth clean and healthy. But slowly international brands started replacing the older methods of maintaining oral hygiene. Earlier consumers were negligent of their oral hygiene and even didn't care to see a dentist for their oral health problems. However, the trend is changing and now a day's dental advice is also considered an important factor while making a purchase decision of the toothpaste brand, at least in urban markets. Today's consumer has a wide variety of choice in terms of tooth paste brands. Toothpastes from paste form, to gel and powder form are present in the market catering to needs of all the segments.

Also, a lot of herbal and medicated toothpastes having natural and anti-sensitivity properties are creating niches for themselves in the market space. This descriptive study mainly focuses on understanding the external factors like demographic, social, product attributes and other external influencers which impact consumer decision making process for buying toothpaste. The method adopted for conducting survey is questionnaire; using non probability convenience sampling technique for gathering information from consumers.

Keywords: Toothpaste, Neem, Consumers, Oral, Purchase, Niches, Demographic

Introduction:

Marketers had long back noted that consumer did not always act or react, as marketing theory would suggest. Consumer behaviour emerged as a stream of management which dealt with the way a consumer goes about making a decision to purchase various products. Selection of an action from two or more alternative choices is termed as a decision. "Consumer purchase decision" involves decision to purchase the goods from the available alternative choice. The various available options to the consumer can be classified into five main types of decisions. They are what to buy, how much to buy, where to buy, when to buy, how to buy. The people who impact the buying decisions may be classified as the initiator, influencer, decider, buyer and users. The size of the consumer market in the country was vast and constantly expanding with 27 millions of dollars being spent on goods and services by millions of people. Consumer preferences are changing and becoming highly diversified. The needs of the consumer which have to be fulfilled, the alternatives existing, the product and brand choices they have and the post buying behaviour of the consumers need to be studied for an effective marketing strategy. The Indian Fast Moving Consumer Goods (FMCG) industry began to shape during the last fifty odd years. The FMCG sector is a cornerstone of the Indian economy. This sector touches every aspect of human life. Indian FMCG market has been divided for a long time between the organized sector and the unorganized sector. Unlike the US market for FMCG which is dominated by a handful of global players, India's Rs. 460 billion FMCG market remains highly fragmented with roughly half the market going to unbranded, unpackaged home-made products. This presents a tremendous opportunity for makers of branded products who can convert consumers to buy branded



products. Toothpaste forms a regular item in the grocery shopping list for monthly or bi-monthly purchases; the price forms an important factor. A lot of options are available to the consumers today in terms of the toothpastes brands ranging from different variants of Colgate which is designed to cater to the needs of all the segments from youths to the older generation, Pepsident, Close-up which comes in a gel form used by youngsters to give a long lasting freshness, Anchor which claims itself to be the 1 vegetarian toothpaste, Dabur, which comes in a powder form Sensodyne and other fluoridated toothpastes which are basically used for anti-sensitivity purposes. Urban India is, in itself, on the way to becoming a major world market. Many companies are focusing their activities in India specifically on urban areas because of the greater accessibility of those markets. Thus, urban consumption growth rather than overall growth is, for many companies, the most significant measure of the future Indian consumer opportunity.

According to McKinsey report of 2007, it is expected that urban consumption would accelerate and continue to grow faster than the overall economy, and forecast a compound annual growth of 9.4 percent over the next 20 years. If incomes follow this growth path, then average annual spending per urban Indian household will more than triple from 115,620 Indian rupees annually today to 378,170 Indian rupees in 2025. As household spending rises, the urban market will expand from 7,208 billion Indian rupees (\$158 billion) to 43,120 billion Indian rupees (\$944 billion) by 2025. At that point, the urban Indian market will exceed the size of France's total consumer market today. Apart from dramatic income growth, one of the main drivers of the rising urban market is the rapid growth in urban population. Nearly two-thirds of the total increase in population in India over the next two decades will occur in urban India. In addition, continued internal migration into urban areas will mean that the share of the country's population in urban areas will rise from 29 percent today to 37 percent in 2025. The combination of births and migration will raise the urban population from 318 million today to 523 million by 2025. Urban India today is already more populous than the entire United States; by 2025, it will exceed the current population of the EU. Rich urban households in India will have spending habits similar to those of their developed-country counterparts—branded apparel, vacations abroad, electronics, and cars will all be high-priority purchases. Finally, another attractive aspect of this target segment will be its geographical concentration. Today 60 percent of urban global households live in the top eight cities of the country (Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad, Ahmadabad and Pune), making them a relatively more visible and easily targeted segment than the other income bands. Consumers in India are set to drive growth, thanks to rising awareness of the importance of oral hygiene and improving income levels. Consumers are switching from traditional, homemade solutions such as datum, mishri and neem leaves to using toothbrushes and toothpaste.

Objectives:

- a) To study the factors that influences the buyers to buy different toothpaste(s).
- b) To examine the brand awareness for various brands and the attributes and influencers impacting purchase decision.
- c) To study the impact of consumer promotions and factors influencing switching behaviour.

Literature review:

Consumer Personality Factors There is two factors mainly influencing the consumers for decision making: Risk aversion and innovativeness. Risk aversion is a measure of how much consumers need to be certain and sure of what they are purchasing (Donthu and Gilliland, 1996). Highly risk adverse consumers need to be very certain about what they are buying. Whereas less risk adverse consumers can tolerate some risk and uncertainty in their purchases. The second variable, innovativeness, is a global measure which captures the degree to which consumers are willing to



toothpaste to consumers. Celebrity endorsement was the most impactful mode of attracting consumers to buy or try a toothpaste brand. Advertisement, sales promotion and recommendations of professional bodies are other marketing elements which impact toothpaste buying. Pricing in spite of being an important marketing mix, is not a major selection criterion in western vidarbha.

The data was meant for capturing information on switching behaviour and reasons for change of existing brand. Promotional offers and retailer influence was the main reason for switching behaviour seen for change in toothpaste brand. Advertisement and vegetarian toothpaste was other reasons for change in brands. Price rise, switching brands occasionally and short supply were the least preferred reasons for change of brands.

Limitations of Study:

The limitation contained in the primary data was that of limited sample size used for study, thus sample cannot be correct representation of the target. Moreover, consumer buying is a complex process in which number of factors like economic factors, social status and psychographic factors influence the buying of the consumer, those are not considered for the study.

Conclusion:

It is very difficult to predict consumer behaviour. Consumer research can to some extent solve this problem. Normally, companies concentrate on only analysing the requirements of consumers and also strategies to retain them. This study was conducted to understand behaviour and motives of consumers in India for buying toothpaste. There is a huge potential for Oral care market in India as penetration and per capita consumption of oral care product is very low. With rising per capita income and better awareness there is an increasing demand seen for oral care products. Many people in India still clean their teeth with traditional products like Neem twigs, salt, ash, tobacco or other traditional substances. The average all India per capita consumption of toothpaste stands at dismal 82gms. The dentist to population ratio is an abysmally low at 1:35000 in the country. All this has contributed to low oral hygiene consciousness and widespread dental diseases. Less than 15% of the Indian toothpaste users brush twice a day. Government of India has taken initiatives like conducting dental health camps for promoting the product consumption and creating awareness among common people on benefits of maintaining oral hygiene.

Therefore, companies need to analyse all these factors and find out the best suitable tools and cultural orientations for promoting their toothpaste brands in India. After economic liberalization of 1990s, Indian markets have borne witness to dramatic shifts in the structures triggered by sharp changes in the lifestyle patterns impacted by technology. Time tested concepts like mass marketing and brand loyalty, are being tested as they fail to gauge the behaviour of new generation customers. The behaviour has been characterized by the uniqueness of individual expectations, preference for multiple options, increasing propensity to abandon loyalty and switch to competitive brands that have higher (perceived) value. The new generation consumers don't mind buying imported products that can satisfy their specific requirement. In such a scenario, it has become difficult to classify the consumers by conventional demographic factors. On the other hand, unless their thinking process and buying behaviour are fully understood, decisions on packaging and product designs, branding and distribution channels are likely to be misplaced.

Bibliography Journals and Books:

1. Assunção, J.L., and Meyer, J.R., (1993): The Rational Effect of Price Promotions on sales and Consumption, *Management Science*, 39(5): 517-535.
2. Bawa, K., and Shoemaker. (1987): The Coupon-Prone Consumer: Some Findings Based on Purchase Behaviour across Product Classes, *Journal of Marketing*, 51(4), 99-110. Bell,

B.Aadhar' International Peer-Reviewed Indexed Research Journal



Impact Factor -(SJIF) -3.575, Issue NO, 338 (CCXXXVIII)

100%
2024
B.Aadhar
2022

3. D.R., Chiang, J., and Padmanabhan, D. (1999): The Decomposition of Promotion and Marketing Science, 18 (4): 504-526.
4. Behura, KC and Panda, JK, (2012): VSRD International Journal of Business Management research, vol2 (2):65-74.
5. Daly, and Ellen. (1993): Advertising impact: Using the power of promotional gifts, The American Salesman, 38 (10):16.

Impact Factor-8.575 (SJIF)

ISSN-2278-9308

B.Aadhar

Peer-Reviewed & Refreed Indexed

Multidisciplinary International Research Journal

February -2022

(CCCXXXVIII) 338



Chief Editor

Prof. Virag S. Gawande

Director

Aadhar Social

Research & Development

Training Institute Amravati

Editor:

Dr.Dinesh W.Nichit

Principal

Sant Gadge Maharaj

Art's Comm,Sci Collage,

Walgaon.Dist. Amravati.

Executive Editor:

Dr.Sanjay J. Kothari

Head, Deptt. of Economics,

G.S.Tompe Arts Comm,Sci Collage

Chandur Bazar Dist. Amravati



This Journal is indexed in :

- Scientific Journal Impact Factor (SJIF)
- Cosmos Impact Factor (CIF)
- International Impact Factor Services (IIFS)

For Details Visit-To : www.aadharsocial.com

Aadhar PUBLICATIONS



INDEX

No.	Title of the Paper	Authors' Name	Page No.
1	Christianity In India: The Early Period And Vasco Da Gama	Anjali Andrey	1
2	The Facets Of Constitutionalism And Present Political Scenario In India: An Analysis	Dr.K B Chaurpagar	5
3	A brief study of historical review of Indian Ethics	Dr. (Mrs.) Seema Deshpande	8
4	Role of ICT in Management Education - Enhancing Quality of Education and A Better Conduit of Learning	Dr. Anita Sable	11
5	The Growing Interoperable Dimensions in Knowledge Society	Dr. Dhananjay W. Deote / Dr. Pramod A. Wadate	21
6	Buying behaviour of students towards toothpaste: A study on western vidarbha	Dr. M. S. Galkwad & Miss. Shraddha D. Rathi	30
7	Silence! The Court is in Session: An Exhibition of Marxism	Dr. Manohar A. Wasnik	35
8	Factors Affecting Higher Education Of Minority Students	Dr. Najma Begum/ Asma	38
9	Bitcoin And Cryptocurrency : Challenges And Opportunities	Dr. Patil Bhagwan Shankar	42
10	The Process of Entrepreneurship	Dr. Rajesh M. Deshmukh	48
11	Effect of Pranayama and Suryanamaskar on Lung Capacity of College Students	Dr. Sanjay V. Deshmukh	51
12	Agricultural Marketing Impact of Covid-19	Dr. Suresh G. Sonawane	54
13	Women Empowerment for Nation's Development	Dr. Tanka Prasad Upadhyaya	58
14	Feminism in English literature: An overview	Dr.Dadarao.K.Upase	63
15	South Travancore Before The Emergence Of Venad	Dr.Sajeey Singh.M.K.	66
16	An overview of Mobilization of resources and its transition towards development of Indianeconomy	Dr.V.A.Pawale / Mr. Narendra Balbhim Mudiraj	70
17	Digital Libraries: An Overview	Jagadish T Patange	73
18	Title:Challenges Before Indian Democracy	Dr. More Nayanath Bhagawan	76
19	Cryptocurrency : Impact On Indian Economy	Dr. Sou. Parvati Bhagwan Patil	79
20	The Importance Of Computers In Research	Prof. Rajesh B. Tandekar	85
21	Impact of E-commerce on Textile industry	Kashish Sandeep Mehra	89
22	India China Border Issues(Dispute)	Dr.Prashant Diwakar Satpute	93



Buying behaviour of students towards toothpaste:

A study on western vidarbha

Dr. M. S. Gaikwad & Miss. Shraddha D. Rathi

Department of Commerce, G. S. Science, Arts & Commerce College,
Khamgaon ,District - Buldana

Abstract

Toothpaste industry is a big market in India. Toothpastes form an important item in the monthly grocery shopping of most of the urban households. In earlier times, consumers especially in India relied on using the traditional substances like Neem twigs or Mishri (Tobacco containing teeth cleaning powder) for keeping their teeth clean and healthy. But slowly international brands started replacing the older methods of maintaining oral hygiene. Earlier consumers were negligent of their oral hygiene and even didn't care to see a dentist for their oral health problems. However, the trend is changing and now a day's dental advice is also considered an important factor while making a purchase decision of the toothpaste brand, at least in urban markets. Today's consumer has a wide variety of choice in terms of tooth paste brands. Toothpastes from paste form, to gel and powder form are present in the market catering to needs of all the segments.

Also, a lot of herbal and medicated toothpastes having natural and anti-sensitivity properties are creating niches for themselves in the market space. This descriptive study mainly focuses on understanding the external factors like demographic, social, product attributes and other external influencers which impact consumer decision making process for buying toothpaste. The method adopted for conducting survey is questionnaire; using non probability convenience sampling technique for gathering information from consumers.

Keywords: Toothpaste, Neem, Consumers, Oral, Purchase, Niches, Demographic

Introduction:

Marketers had long back noted that consumer did not always act or react, as marketing theory would suggest. Consumer behaviour emerged as a stream of management which dealt with the way a consumer goes about making a decision to purchase various products. Selection of an action from two or more alternative choices is termed as a decision. "Consumer purchase decision" involves decision to purchase the goods from the available alternative choice. The various available options to the consumer can be classified into five main types of decisions. They are what to buy, how much to buy, where to buy, when to buy, how to buy. The people who impact the buying decisions may be classified as the initiator, influencer, decider, buyer and users. The size of the consumer market in the country was vast and constantly expanding with 27 millions of dollars being spent on goods and services by millions of people. Consumer preferences are changing and becoming highly diversified. The needs of the consumer which have to be fulfilled, the alternatives existing, the product and brand choices they have and the post buying behaviour of the consumers need to be studied for an effective marketing strategy. The Indian Fast Moving Consumer Goods (FMCG) industry began to shape during the last fifty odd years. The FMCG sector is a cornerstone of the Indian economy. This sector touches every aspect of human life. Indian FMCG market has been divided for a long time between the organized sector and the unorganized sector. Unlike the US market for FMCG which is dominated by a handful of global players, India's Rs. 460 billion FMCG market remains highly fragmented with roughly half the market going to unbranded, unpackaged home-made products. This presents a tremendous opportunity for makers of branded products who can convert consumers to buy branded



products. Toothpaste forms a regular item in the grocery shopping list for monthly or bi-monthly purchases; the price forms an important factor. A lot of options are available to the consumers today in terms of the toothpastes brands ranging from different variants of Colgate which is designed to cater to the needs of all the segments from youths to the older generation, Pepsident, Close-up which comes in a gel form used by youngsters to give a long lasting freshness, Anchor which claims itself to be the 1 vegetarian toothpaste, Dabur, which comes in a powder form Sensodyne and other fluoridated toothpastes which are basically used for anti-sensitivity purposes. Urban India is, in itself, on the way to becoming a major world market. Many companies are focusing their activities in India specifically on urban areas because of the greater accessibility of those markets. Thus, urban consumption growth rather than overall growth is, for many companies, the most significant measure of the future Indian consumer opportunity.

According to McKinsey report of 2007, it is expected that urban consumption would accelerate and continue to grow faster than the overall economy, and forecast a compound annual growth of 9.4 percent over the next 20 years. If incomes follow this growth path, then average annual spending per urban Indian household will more than triple from 115,620 Indian rupees annually today to 378,170 Indian rupees in 2025. As household spending rises, the urban market will expand from 7,208 billion Indian rupees (\$158 billion) to 43,120 billion Indian rupees (\$944 billion) by 2025. At that point, the urban Indian market will exceed the size of France's total consumer market today. Apart from dramatic income growth, one of the main drivers of the rising urban market is the rapid growth in urban population. Nearly two-thirds of the total increase in population in India over the next two decades will occur in urban India. In addition, continued internal migration into urban areas will mean that the share of the country's population in urban areas will rise from 29 percent today to 37 percent in 2025. The combination of births and migration will raise the urban population from 318 million today to 523 million by 2025. Urban India today is already more populous than the entire United States; by 2025, it will exceed the current population of the EU. Rich urban households in India will have spending habits similar to those of their developed-country counterparts—branded apparel, vacations abroad, electronics, and cars will all be high-priority purchases. Finally, another attractive aspect of this target segment will be its geographical concentration. Today 60 percent of urban global households live in the top eight cities of the country (Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad, Ahmadabad and Pune), making them a relatively more visible and easily targeted segment than the other income bands. Consumers in India are set to drive growth, thanks to rising awareness of the importance of oral hygiene and improving income levels. Consumers are switching from traditional, homemade solutions such as datum, mishri and neem leaves to using toothbrushes and toothpaste.

Objectives:

- a) To study the factors that influences the buyers to buy different toothpaste(s).
- b) To examine the brand awareness for various brands and the attributes and influencers impacting purchase decision.
- c) To study the impact of consumer promotions and factors influencing switching behaviour.

Literature review:

Consumer Personality Factors There is two factors mainly influencing the consumers for decision making: Risk aversion and innovativeness. Risk aversion is a measure of how much consumers need to be certain and sure of what they are purchasing (Donthu and Gilliland, 1996). Highly risk adverse consumers need to be very certain about what they are buying. Whereas less risk adverse consumers can tolerate some risk and uncertainty in their purchases. The second variable, innovativeness, is a global measure which captures the degree to which consumers are willing to



toothpaste to consumers. Celebrity endorsement was the most impactful mode of attracting consumers to buy or try a toothpaste brand. Advertisement, sales promotion and recommendations of professional bodies are other marketing elements which impact toothpaste buying. Pricing in spite of being an important marketing mix, is not a major selection criterion in western vidarbha.

The data was meant for capturing information on switching behaviour and reasons for change of existing brand. Promotional offers and retailer influence was the main reason for switching behaviour seen for change in toothpaste brand. Advertisement and vegetarian toothpaste was other reasons for change in brands. Price rise, switching brands occasionally and short supply were the least preferred reasons for change of brands.

Limitations of Study:

The limitation contained in the primary data was that of limited sample size used for study, thus sample cannot be correct representation of the target. Moreover, consumer buying is a complex process in which number of factors like economic factors, social status and psychographic factors influence the buying of the consumer, those are not considered for the study.

Conclusion:

It is very difficult to predict consumer behaviour. Consumer research can to some extent solve this problem. Normally, companies concentrate on only analysing the requirements of consumers and also strategies to retain them. This study was conducted to understand behaviour and motives of consumers in India for buying toothpaste. There is a huge potential for Oral care market in India as penetration and per capita consumption of oral care product is very low. With rising per capita income and better awareness there is an increasing demand seen for oral care products. Many people in India still clean their teeth with traditional products like Neem twigs, salt, ash, tobacco or other traditional substances. The average all India per capita consumption of toothpaste stands at dismal 82gms. The dentist to population ratio is an abysmally low at 1:35000 in the country. All this has contributed to low oral hygiene consciousness and widespread dental diseases. Less than 15% of the Indian toothpaste users brush twice a day. Government of India has taken initiatives like conducting dental health camps for promoting the product consumption and creating awareness among common people on benefits of maintaining oral hygiene.

Therefore, companies need to analyse all these factors and find out the best suitable tools and cultural orientations for promoting their toothpaste brands in India. After economic liberalization of 1990s, Indian markets have borne witness to dramatic shifts in the structures triggered by sharp changes in the lifestyle patterns impacted by technology. Time tested concepts like mass marketing and brand loyalty, are being tested as they fail to gauge the behaviour of new generation customers. The behaviour has been characterized by the uniqueness of individual expectations, preference for multiple options, increasing propensity to abandon loyalty and switch to competitive brands that have higher (perceived) value. The new generation consumers don't mind buying imported products that can satisfy their specific requirement. In such a scenario, it has become difficult to classify the consumers by conventional demographic factors. On the other hand, unless their thinking process and buying behaviour are fully understood, decisions on packaging and product designs, branding and distribution channels are likely to be misplaced.

Bibliography Journals and Books:

1. Assunção, J.L., and Meyer, J.R., (1993): The Rational Effect of Price Promotions on sales and Consumption, *Management Science*, 39(5): 517-535.
2. Bawa, K., and Shoemaker. (1987): The Coupon-Prone Consumer: Some Findings Based on Purchase Behaviour across Product Classes, *Journal of Marketing*, 51(4), 99-110. Bell,

B.Aadhar' International Peer-Reviewed Indexed Research Journal



Impact Factor -(SJIF) -3.575, Issue NO, 338 (CCXXXVIII)

100%
2024
B.Aadhar
2022

3. D.R., Chiang, J., and Padmanabhan, D. (1999): The Decomposition of Promotion and Marketing Science, 18 (4): 504-526.
4. Behura, KC and Panda, JK, (2012): VSRD International Journal of Business Management research, vol2 (2):65-74.
5. Daly, and Ellen. (1993): Advertising impact: Using the power of promotional gifts, The American Salesman, 38 (10):16.

A STUDY ON THE IDENTIFICATION AND ANALYSIS OF DIFFERENT MACRONUTRIENTS OF THE SOIL THROUGH ADVANCED TECHNIQUES

J.S. Tated^{*1}, C.M. Jadhao² and D.S. Dhote³

^{*1}PG Department of Electronics, Brijlal Biyani Science College, Amravati, Dist. Amravati, MS, India

²Mauli College of Engineering & Technology, Shegaon Dist- Buldhana, MS, India

³Brijlal Biyani Science College, Amravati, Dist. Amravati MS, India

^{*1}jayesh.tated@gmail.com

ABSTRACT

Soil nutrients testing is helpful for identifying nutrients contents in the soil before applying fertilizer for quality and process control of agricultural produce and soil fertility. In this paper we have reviewed different system for detection of various macronutrients of the soil. Nitrogen (N), Phosphorus (P) and Potassium (K) are the key nutrients which are mainly responsible for plant growth. Soil electrical conductivity, pH level, soil temperature also effect the productivity of the crop.

Keywords: Soil, Nitrogen, Phosphorus, Potassium, Temperature, Electrical Conductivity.

I. Introduction

Agriculture is the backbone of Indian economy. In India, around 70% of the population earns its earnings from agriculture [2]. Soil fertility changes with every harvest and varying weather condition, this affects the nutrient contents of soil [5, 9]. Soil efficiency can be achieved by giving suitable amount of fertilizers to the soil. These fertilizers plays key role by giving essential soil nutrients to the crop land those are required for nourishing and growth of crop [3]. To increase crop production, excessive chemical fertilizers are added to the soil. This unnecessary addition of fertilizers causes an undesirable environmental impact, an unnecessary increase in the cost of production and decline in crop yield and crop response ratio [7, 8]. Hence soil nutrient detection is greatly necessary for proper plant growth and effective fertilization [4].

At present day soil analysis techniques are time intense and high price and carried out in laboratories. It is necessary to use a technique that has a fast response time and an away that allow real time, on-site soil nutrient analysis. A great need to modernize the conventional analysis of soil parameters in agricultural practices for the higher productivity and result. In situ monitoring of soil parameters is an emerging trend which may have the potential to transform agricultural practices to increase productivity [6]. Number of researcher has developed soil nutrients detection methods by using various methods, including Conductivity,

optical, electrochemical but lots farmers suffer due to lack of knowledge and their own incapability to utilize these advanced methods. [1] Hence after taking review on all the conditions, we have decided to study a different system reported by researchers for the soil nutrients identification & analysis.

II. Literature Survey

Agni Biswas and Sarthak Prakash [1] presented the “Farming Technology for India Agriculture Based Sensorics and Indicative Systems”; in this paper authors intends to present methods to provide the farmer a tool that increase his information which will result in the output of his farm. For that author monitors Soil moisture levels, PH levels, Humidity and temperature of the soil and according to inputs from these variables pipe valve will be turn on & off.

After studying this [1] we think that rapid technological advances and timely policy interventions have not only helped to stop food crisis in India but also ensured steady increase in food production.

Chetan Dwarkani M et al [2] presented the “Smart Farming System Using Sensors for Agricultural Task Automation” in this paper author described advanced farming by linking a sensible sensing system and smart irrigation system through wireless communication technology. Their system include some physical parameters such as soil moisture content, nutrient content, and pH of the soil which plays a vital role in farming activities. Based on the detection of essential parameters

of the soil, the required quantity of green manure, compost, and water is splashed on the crops using a smart irrigation system.

In this paper [2] author describe moisture sensor content based sufficient amount of water was sprinkled by the irrigator system.

Akshay Sankpal and Krishna K. Warhade [3] presented the “review of optoelectronic detection methods for the analysis of soil nutrients” in this paper author reviewed sensing technology and other portable various methods which were useful in the determination of soil nutrients viz. NPK like electrochemical, mechanical, optical etc. mainly optical methods were studied for the determination of soil nutrients with the uses of optical LED’s and VIR-NIR methods.

In this paper [3] author studied various methods which were used to determine soil nutrients and they found optical method is efficient and low power consumption.

Tamal Adhikary et al [4] presented the “Test Implementation of a Sensor Device for Measuring Soil Macronutrients” in this paper author developed a sensing system using high precision, wide spectral range Photo Diode (PD), low spectral-width Light Emitting Diode (LED), microcontroller, analog-to-digital converter (ADC) for detecting soil macronutrients. They have integrated a GPRS modem with sensing unit for remote data collection to a server. The test samples were carried out from different farmlands and the outcome were compared with those obtained by a color chart judgment after laboratory analysis. After studying this paper [4] we found that the measurement using current sensing system is restricted by only three macronutrients of the soil and it requires soil solution, which needs to be prepared in a chemical laboratory.

D. Rupa et al [5] presented the “ A Novel Approach for Soil Testing using Embedded System” in this paper author develop a testing system which can be used for soil analysis, which helps the farmers to grow and produce the proper crop. System detects the Nitrogen, Potassium, Phosphorous and PH of soil. Nitrate and phosphorous ISE were used to measure concentration of Nand K nutrient of soil.

After studying this paper [5] we found that proper soil test will help to the use of enough fertilizer according to the requirements of the

crops, although taking benefit of the nutrients already present in the soil.

Abdullah Na et al [6] presented the “An IOT Based System for Remote Monitoring of Soil Characteristics” in this paper the author used antimony electrode for pH measurement. For soil moisture content evaluation, the inverse relation between soil resistance and soil moisture has been used and related circuitry has been developed. The soil temperature sensor DS18B20 was used which worked on Dallas one wire protocol. The system was incorporated with Bluetooth for the transfer of data to a nearby cell phone. The whole system was developed on STM32Nucleo platform.

In this paper [6] researcher has been considered soil pH, temperature, and moisture measurement. The system has developed on STM32 board with use of Bluetooth to communication with farmer’s smart phone.

Dr. Neeta A. Doshi et al [7] presented the “Soil N-P-K Monitoring and Control System using FPGA: A Review” in this paper the percentage of Nitrogen, Phosphorus and Potassium by using sensor and monitoring is analyzed and FPGA system was proposed.

After studying this paper [7] we conclude NPK fertilizer does not reduce soil bulk density. This will be due to increased availability of N and K in the soil.

Laxmi C. Gavade et al [8] published the “N, P, K Detection & Control for Agriculture Applications using PIC Controller: A Review” in this paper author reviewed different detection of N, P and K contents, humidity of the soil by using different sensors and also monitor the temperature and sunlight in the farmland.

After reading this paper [8] we found that overall these techniques have verisimilar and all the process will take place using chemical laboratory to detect the presence of soil macronutrients, though separately measurements of the nutrients still remains an open challenge due to some factors such as expensive spectrometers and other sensor techniques.

Dharesh Vadalia et al [9] presented the “Real Time soil fertility analyzer and crop prediction” in this paper author determine the average percentage of basic soil nutrients Nitrogen, Phosphorous and Potassium with the help of pH meter and predict the suitable crops for the

particular soil type in real time. System was built on Arduino.

After studying this paper [9] we found that by using pH meter and EC sensor pH & electrical conductivity is measured in real time. The pH meter reading gives the approximate ratio of various nutrient content present in soil and in what proportion. This estimate of soil nutrient will decide the suitable crop for the farmland.

Deepa V. Ramane et al [10] presented the "Detection of NPK nutrients of soil using Fiber Optic Sensor": In this paper author has developed a fiber optic based color sensor to determine N, P, and K values with in the soil sample. For that colorimetric measurement of aqueous solution of soil has been used. The color detector relies on the principle of absorption of color by solution. It helps in deciding the N, P, K amounts as high, medium, low, or none. The sensor probes beside correct signal acquisition circuits were constructed to detect the deficient element of the soil. It was helpful in dispensing only needed amount of fertilizers in the soil.

After studying this [10] we found, optical fiber based color sensor was developed to detect the absence of the nutrients N, P or K in the soil. Optical NPK sensor is worked on the principle of iteration between incident light & soil surface properties.

III. Various Available Sensor Techniques

There are different types of sensors that may be used to detect various nutrients of soil. Soil micronutrients detections are usually performed by three steps: Soil sampling, sample pretreatment and chemical analysis. In real time, detection of NPK is carried out by three methods viz. Conductivity measurement, electrochemical measurement methods and Optical measurement method to analyze concentration of primary nutrients [10].

A] Conductivity Method

In this method, two or three electrodes of same / different material are used to dip in soil samples. Materials used may be steel, silver, platinum, antimony, graphite or copper [10]. An A.C. voltage is applied to electrodes in the sample. Reference electrode is attached to multimeter to get the current changes. The A.C. voltage leads to movements of ion that results

variableness of current of soil sample. Use of A.C. voltage avoids neutralization of ions. Varied current offers varied conductivity. Variability between electrical conductivity and N, P, K Concentration is observed. [8]. According to concentration of NPK in soil, conductivity of electrode change. The change in conductivity is converted into electrical signal with the help of transducers for further interface with electronic control system.

B] Electrochemical Method

Electrochemical sensors constitute Ion Selective Electrode and Ion Selective Field Effective Transistor. It requires ion selective membranes, which are integrated with the reference electrode and enable the ion concentration response to be converted into electric potentials. Ion Selective Electrode (ISE) and Ion Selective Field Effective Transistor (ISFET) use different membranes, extraction solutions, and a multi-target system with coated wire field-effect transistor [10].

C] Optical Method

Optical NPK sensors concern with incident light and soil surface properties, the characteristics of the reflected light vary due to the soil physical and chemical properties [10]. Laser Induced Florescence Spectroscopy is optical technique in which analyte in the molecule absorbs radiation at UV and visible a wavelength. NIR is a spectro photometric method that deals with the interaction of near infrared radiation with the sample under analysis [8]. These optical ways are reliable but time-consuming, high cost per test and not easily replicable, this resulted in the limitation of the number of soil samples tested for characterizing the spatial changeability of soil nutrients in a field or fields [10].

IV. Conclusion

An appropriate soil test will ensure a sufficient amount of fertilizer use to meet the requirements of the crop while considering the nutrients already present in the soil. We have studied various types of methods which are useful in the determination of soil nutrients found that chemical method required complex laboratory testing and this time consuming doesn't gives results in real time period.

Optical methods are studied for the

determination of soil nutrients which use optical LED's and VIR-NIR methods. Optical methods are efficient and having low power consumption. Electrochemical method responds to a particular ion in the solution according to logarithmic relationship between the ionic activity and electric potentials. There is limited soil nutrients lab-on-a-chip system available commercially. Hence more effective tools need to be invented to enhance the production from

the soil and make easy the farmers struggle for survival.

Acknowledgement

The authors would like to acknowledge for the financial assistance from UGC-MAN, New Delhi, in the form of Junior Research Fellowship (JRF), Senior Research Fellowship (SRF), which supported the study.

References

1. Biswas, A., & Prakash, S. (2015, July). Farming technology for India agriculture based sensorics and indicative systems. In 2015 IEEE Technological Innovation in ICT for Agriculture and Rural Development (TIAR) (pp. 72-78). IEEE.
2. Jagannathan, S., & Priyatharshini, R. (2015, July). Smart farming system using sensors for agricultural task automation. In 2015 IEEE Technological Innovation in ICT for Agriculture and Rural Development (TIAR) (pp. 49-53). IEEE.
3. Sankpal, A., & Warhade, K. K. (2015). Review of optoelectronic detection methods for the analysis of soil nutrients. *International Journal of Advanced Computing and Electronics Technology (IJACET)*, 2(2), 26-31.
4. Adhikary, T., Das, A. K., Razzaque, M. A., Chowdhury, M. E. H., & Parvin, S. (2015, January). Test implementation of a sensor device for measuring soil macronutrients. In 2015 International Conference on Networking Systems and Security (NSysS) (pp. 1-8). IEEE.
5. Rupa D., Arunmohan Raj B., G... & Gopalkrishnan, R. (2016, April). A novel approach for soil testing using Embedded System. In National Conference on Emerging Trends in Renewable Energy NCETRE 2016 (pp. 58-62). IJIREEICE.
6. Na, A., Isaac, W., Varshney, S., & Khan, E. (2016, October). An IoT based system for remote monitoring of soil characteristics. In 2016 International Conference on Information Technology (InCITe)-The Next Generation IT Summit on the Theme-Internet of Things: Connect your Worlds (pp. 316-320). IEEE.
7. Dr.Neeta, Pratiksha, Suraj S.Padamwar, Swati S.Shitole, (2017, November). Soil N-P-K Monitoring and Control System using FPGA: A Review, *International Journal of Electronics, Electrical and Computational System*, 6(11), (pp.66-69), IJEECS.
8. Gavade, L. C., & Bhoi, M. A. (2017). NPK Detection & Control for Agriculture Applications using PIC Controller: A Review. *International Journal of Engineering Research & Technology (IJERT)*, 6(04).
9. Vadalia, D., Vaity, M., Tawate, K., Kapse, D., & Sem, S. V. (2017). Real Time soil fertility analyzer and crop prediction. *International Research Journal of Engineering and Technology (IRJET)*, 4(3), 1497-1499.
10. Ramane, D. V., Patil, S. S., & Shaligram, A. D. (2015, February). Detection of NPK nutrients of soil using Fiber Optic Sensor. In *International Journal of Research in Advent Technology Special Issue National Conference ACGT 2015* (pp. 13-14).



INFLUENCE OF ATMOSPHERIC CONDITIONS ON SOIL PROPERTIES IN VIDARBHA REGION: AN IoT BASED REMOTE MONITORING SYSTEM

J. S. Tated ^{*1}, C. M. Jadhao²

^{*1} Research Scholar, Post Graduate Department of Electronics, Brijlal Biyani Science College, Amravati, Dist. Amravati, M.S., India

² Principal, Mauli College of Engineering & technology, Shegaon Dist. Buldhana, M.S., India

ABSTRACT:

Increasing air temperatures are probable to continue in the future. The relation between soil moisture and near surface air temperature, relative humidity is important for climate change and climate extremes. In this paper we are going to study the effect of atmospheric conditions like Air Temperature, Relative Humidity on soil properties. For this Microcontroller Arduino Nano V3.0, DHT22 & corrosion less Capacitive Soil Moisture sensor V2.0 are used and the results are transmitted to cloud with the help of ESP8266 Wi-Fi module.

KEYWORDS: Arduino, ESP8266, air temperature, humidity, soil temperature, soil moisture, luminosity.

Introduction:

According to recent report of the Intergovernmental Panel on Climate Change, global temperatures are likely to rise between 1.1 to 6.4 °C during the 21st century and rainfall patterns will be changed. Soils are complexity associated to the atmospheric system. Due to this, change climate will have an effect on soil processes and properties [1]. The economy of India is principally base on agriculture and the atmospheric conditions are isotropic and thus farmers are don't seem to be able to make full use of agricultural resources [2]. Modern agriculture needs implementation of technologies which can increase production efficiency, product quality, postharvest operations, and reduce their environmental impact [4]. Soil fertility changes with every harvest and varying weather condition, this affects the nutrient contents of soil [5]. In last few years atmospheric conditions are isotropic like unseasonal rain, globalization etc. though still today number of farmers doing conventional methods for farming but due to sudden changes in weather conditions, many farmers may reduce their crop productions hence we need to regulate this. So we proposed IoT based remote

monitoring system, for monitoring various factors of agricultural environment as well as soil parameters which affects from atmospheric changes such as air temperature, humidity, soil temperature, soil moisture and luminosity etc.

NECESSITY:

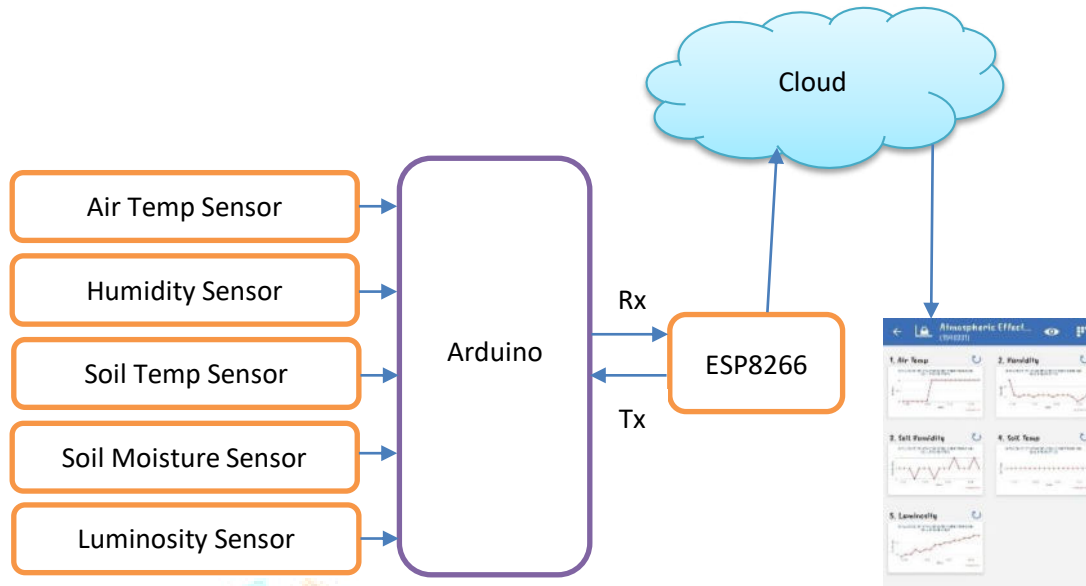
Soil atmospheric conditions varies seasonally and daily which may result from changes in radiant energy and energy changes taking place through the soil surface [3]. Due to sudden changes in weather conditions i.e. unseasonal rain and or cloudy environment, many farmers may reduce their crop productions & profitability. A wireless monitoring system has abilities to monitoring atmospheric conditions remotely. It can recognize the weather conditions at early stage so that farmer can take necessary action accordingly [6].

METHODOLOGY:

System Configuration: Several sensors are used for monitoring the environmental factors and the effect on soil parameters. The outputs of various sensors are connected to the microcontroller. At user defined intervals the signals are measured, transferred to cloud with the help of ESP8266 WIFI module and the data can be accesses remotely by farmer.

A. System Block Diagram:

It is proposed to implement an IoT based remote monitoring system consist of a microcontroller i.e. Arduino Uno, ESP8266 WIFI module and different sensors. In this system, readings are taken from Air temperature, Humidity, Soil Temperature, Soil Moisture and Luminosity sensors and store it on cloud server and graph is drawn as per the variations in sensor readings. The sensors and microcontroller are successfully interfaced to the cloud. The data is stored successfully on cloud server named ThingSpeak.com and can be accessed remotely by the farmer with the help of android app i.e. Thing Show freeware app available at google play store by putting read API key of their cloud channel. The coding is done through Arduino IDE, and for storing the sensor data in cloud server like Thingspeak.com used and interfacing of microcontroller with cloud server is done by using ESP8266 Wi-Fi module.



B. Hardware Description:

i. **Air Temperature & Humidity Sensor:** Here DHT22 sensor is used. DHT22 sensor is a digital sensor which is used for sensing the air temperature and humidity. Since library of DHT22 is directly available, this sensor generates the calibrated values, so manual calibration is not required. It needs 3 to 5V power and 2.5mA max current use during conversion. It measures 0-100% humidity readings with 2-5% accuracy and temperature measurement ranges from -40 to 80°C with $\pm 0.5^\circ\text{C}$ accuracy.



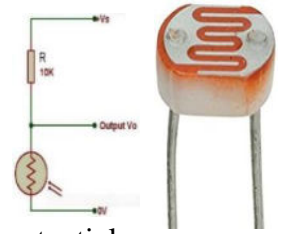
ii. **Soil Temperature Sensor:** Here DS18B20 sensor is employed for soil temperature measurement. This is often a pre-wired and waterproofed sensor used to measure in wet conditions. It can measure the temperature between -55 to 125°C (-67°F to +257°F). Its 1-wire digital temperature sensor and properly precise, i.e. $\pm 0.5^\circ\text{C}$ over considerable range. This sensor needs two libraries like Dallas Temperature Sensor Library & One-Wire Library. It also requires a 4.7k resistor, which is required as a pull-up from the DATA to the VCC line when using the sensor.



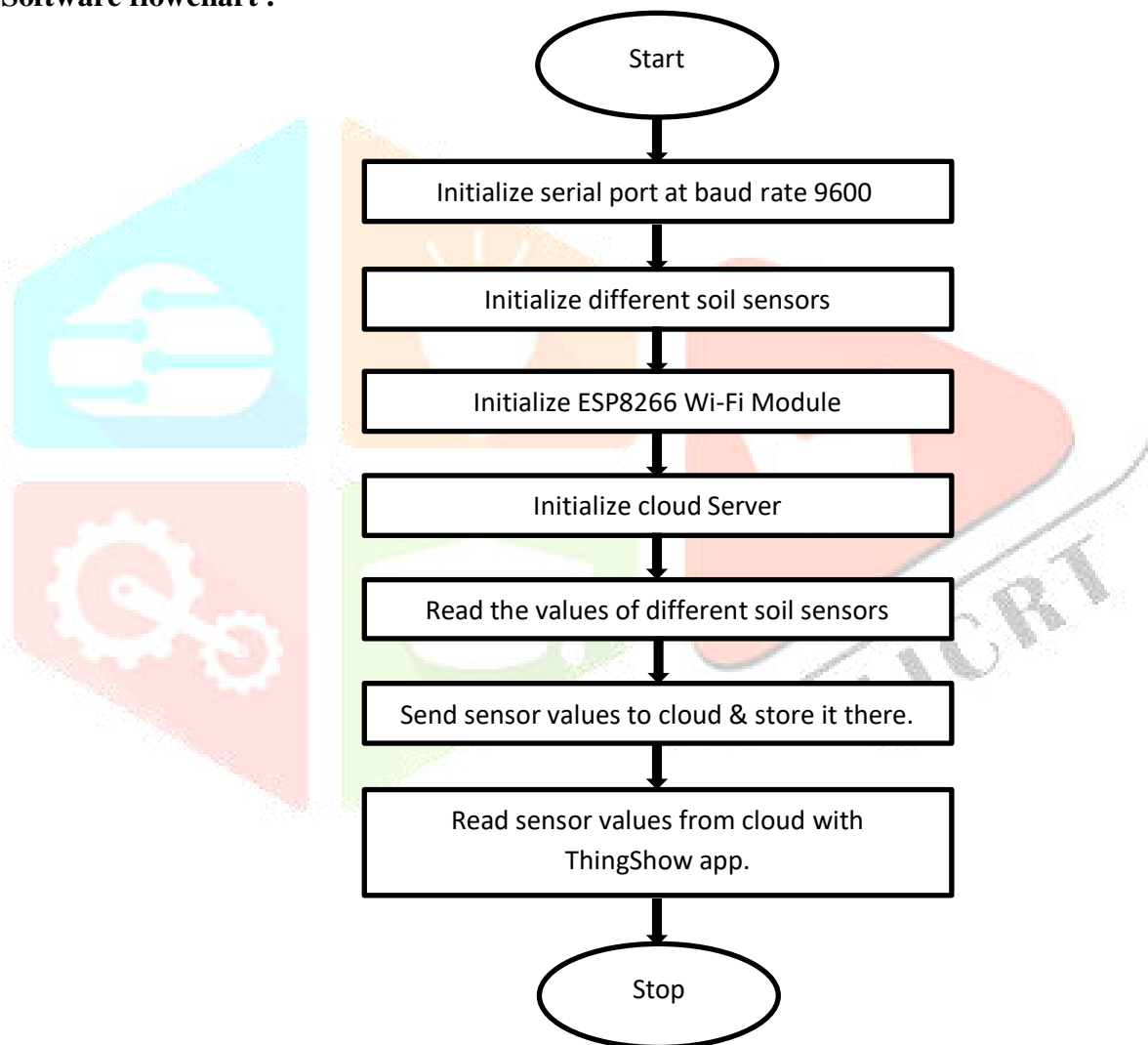
iii. **Soil Moisture Sensor:** Here we are using capacitive soil moisture sensor V2.0, is made of a corrosion-resistant material which provides it long service life. The capacitance of the electrodes changes with the amount of water once it inserted into the soil. This sensor supplied with 3.3V-5.5V DC voltages and output we get in analog form.



- iv. **Luminosity Sensor:** Here LDR is employed as luminosity measurement. LDR is Light Dependent Resistor. As intensity of light increases, the resistance of LDR decreases, and vice versa. In this system, I have designed a voltage divider network using LDR and a 10KΩ resistance. As the intensity changes, the voltage drop across the LDR also changes, and hence potentials proportional to the intensity of light.



C. Software flowchart :



RESULTS:

The IoT based remote monitoring system capable for monitoring atmospheric conditions which affect on soil properties. For that we consider Air Temperature, Humidity, Soil Temperature, Soil Moisture, and Luminosity parameters and analyze them. From the sensor values, found that as the intensity of light and or

Air temperature are inversely proportional to the atmospheric humidity. As the atmospheric humidity increases soil temperature decreases which results decline in soil moisture evaporation and increases in water viscosity. Hence small amount of irrigation required. Which reduces irrigation time and electricity of the farmers. The output can be seen on serial monitor of the Arduino IDE as well as on Thingspeak.com Cloud server by login to it and on smartphones of farmer with the help of Thing Show App and read API key of their cloud channel. The graphs plotted in Thing speak server is shown in the below

Graphical representation of different sensors.



CONCLUSION:

The Proposed System results in the designing, development and optimization of a real time solution for application to the agricultural i.e. atmospheric conditions monitor to reduce potentially negative environmental impacts on crop production. So the propose system may be helpful to the farmers for accurate and precise measurement of different atmospheric parameters at their farm & also helps in increasing the profitability of crop production.

ACKNOWLEDGMENTS:

The authors would like to acknowledge for the financial assistance from the UGC-MANF, New Delhi, in the form of Junior Research Fellowship (JRF) and Senior Research Fellowship (SRF), which supported the study.

REFERENCES:

- [1] E. C. Brevik, "The potential impact of climate change on soil properties and processes and corresponding influence on food security," *Agric.*, vol. 3, no. 3, pp. 398–417, 2013.
- [2] Mr. S. Gaikwad, and Int, "Measurement of NPK, Temperature, Moisture, Humidity using WSN," *J. Eng. Res. Appl. www.ijera.com ISSN*, vol. 5, no. 83, pp. 2248–962284, 2015.
- [3] B. onwuka, "Effects of Soil Temperature on Some Soil Properties and Plant Growth," *Adv. Plants Agric. Res.*, vol. 8, no. 1, pp. 34–37, 2018.
- [4] V. SSaptasagare and B. B Kodada, "Real-Time Implementation and Analysis of Crop-Field for Agriculture Management System based on Microcontroller with GPRS (M-GPRS) and SMS," *Int. J. Comput. Appl.*, vol. 98, no. 5, pp. 1–6, 2014.
- [5] Tated J. S., Jadhao C.M., and D. D.S., "a Study on the Identification and Analysis of Different Macronutrients of the Soil Through Advanced Techniques," *Vidyabharati Int. Interdiscip. Res. J.*, vol. 12, no. 2, pp. 344–347, 2021
- [6] S. Kiruthika Devi, G. Varshney, and A. Sethi, "Automatic soil management system for household purposes," *Indian J. Sci. Technol.*, vol. 9, no. 39, 2016.
- [7] N. Pareek, "Climate Change Impact on Soils: Adaptation and Mitigation," *MOJ Ecol. Environ. Sci.*, vol. 2, no. 3, pp. 136–139, 2017.
- [8] J.Indirapriyadharshini and M. T. P. G.Gokul, V.Swathi, "ON THE GO SOIL NUTRIENT IDENTIFICATION AND AUTOMATED FERTIGATION SYSTEM," *Int. J. Pure Appl. Math.*, vol. 118, no. 20, pp. 1525–1530, 2018.
- [9] P. Sindhu and G. Indirani, "IoT Enabled Soil Testing," *Asian J. Comput. Sci. Technol.*, vol. 7, no. 1, pp. 54–57, 2018.
- [10] N. N. C. Othaman, M. N. M. Isa, R. C. Ismail, M. I. Ahmad, and C. K. Hui, "Factors that affect soil electrical conductivity (EC) based system for smart farming application," *AIP Conf. Proc.*, vol. 2203, no. January, 2020.
- [11] A. Pathak, M. A. Uddin, M. Jainal Abedin, K. Andersson, R. Mustafa, and M. S. Hossain, "IoT based smart system to support agricultural parameters: A case study," *Procedia Comput. Sci.*, vol. 155, pp. 648–653, 2019.
- [12] M. Ayaz, M. Ammad-Uddin, Z. Sharif, A. Mansour, and E. H. M. Aggoune, "Internet-of-Things (IoT)-based smart agriculture: Toward making the fields talk," *IEEE Access*, vol. 7, pp. 129551–129583, 2019.
- [13] K. I. Islam, A. Khan, and T. Islam, "Correlation between Atmospheric Temperature and Soil Temperature: A Case Study for Dhaka, Bangladesh," *Atmos. Clim. Sci.*, vol. 05, no. 03, pp. 200–208, 2015.
- [14] J. Adeyeye, O. Akintan, and O. Omoju, "Climate Change Effect and Adaptation Measures on Selected Soil Properties," *J. Soil Sci. Environ. Manag.*, vol.9, no.10, pp.154–163, 2018.

An IoT Enabled Colorimetric Technique Based Soil Fertility Detection System

J. S. Tated¹, C. M. Jadhao²

¹ Research Scholar, Post Graduate Department of Electronics, Brijlal Biyani Science College, Amravati, Dist. Amravati, M.S., India

² Principal, Mauli College of Engineering & technology, Shegaon Dist. Buldhana, M.S., India

Abstract:

Agriculture is a wide economic sector and plays a vital role within the overall economic development of the nation. Technological advancements in the sector of agriculture can ascertain to enhance the ability and quality of assured farming activities. Bad quality crop production is often because of either unnecessary use of fertilizer or insufficient addition of fertilizer. The intend of our developed system is to detect the N(nitrogen), P(phosphorus) and K(potassium) contents of soil and based on the result, farmers will used the necessary fertilizers as per need. For this we proposed IoT enabled colorimetric techniques based soil fertility detection system. Based on a color sensor (TCS 3200) as a soil fertility detection sensor, microcontroller (Arduino Nano V3) and Esp8266 Wi-Fi module for transferring data to cloud.

Keywords: Color Sensor, Soil Fertility, NPK nutrients, ESP8266, Internet of things, Arduino.

I. Introduction:

Agriculture is the only source for crop production. Soil is a valuable resource in agriculture. The physical and chemical conditions of soil play a most important role in the crop production cycle. In addition to this farmers can also add organic or inorganic nutrients to the soil in a precise proportion. Thus soil fertility detection plays a major role for better crop growth as well as yield [1]. Continuous cropping without enough measurement of soil nutrients may lead decrease in soil fertility and yield. Soil nutrient identification is greatly required for proper plant growth and effective fertilization [2], [3]. Farmer's follows traditional techniques still today which commonly make used of approximations i.e. unbalance feeding of fertilizer without knowing the actual necessity of nutrient to a specific crop, results in low productivity [4]. In order to improve the farm meadow, the fertility of soil is an important factor in increasing the crop production. The soil fertility is, amount of nutrients content available in the soil. There are 17 nutrients available in the soil classified into two classes namely macronutrients and micronutrients. Nitrogen (N), Phosphorous (P), Potassium (K) are some of the main macronutrients, which usually required in large quantity in the soil and zinc, copper, iron, boron are some examples of micronutrients which required in comparatively small amounts. The quantity of macronutrients defines the soil fertility [5]. Depending upon the deficiency of a particular nutrient for a particular crop in a given region the amount of fertilizer is determined. Thus the quantity of fertilizer to be used depends upon the soil fertility, crop to be grown and type of soil [6].

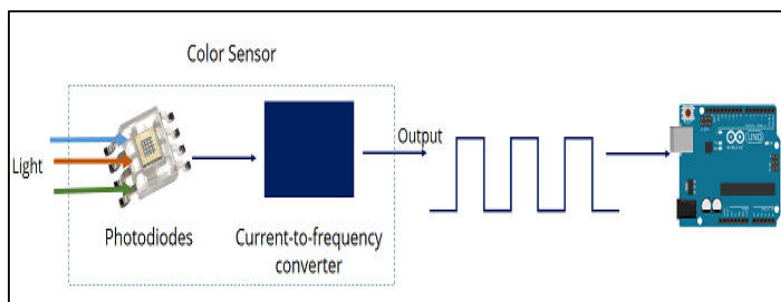
The general soil testing is take place in laboratories which are maximum available at district level also it take a considerable time to generates the results. Hence this process is time consuming and costly too [7]. Moreover the overall soil fertility changes with change in weather conditions. Thus a system required which will detect the soil nutrients in real time.

This system is based on colorimetric technique. In this, color sensor is used as a soil nutrient sensor, an aqueous solution of soil under test has been added different reagents which will eventually change its color depending on the concentration of the present micro nutrients values. Light emitted from a color detecting sensor will fall on the solution and the reflected light is received by color detecting sensor will convert the (R, G, B) values to electrical signals. Further using the threshold values which were earlier saved in the database of the microcontroller helps to detect the levels of micronutrients present in the soil sample.

II. Methodology

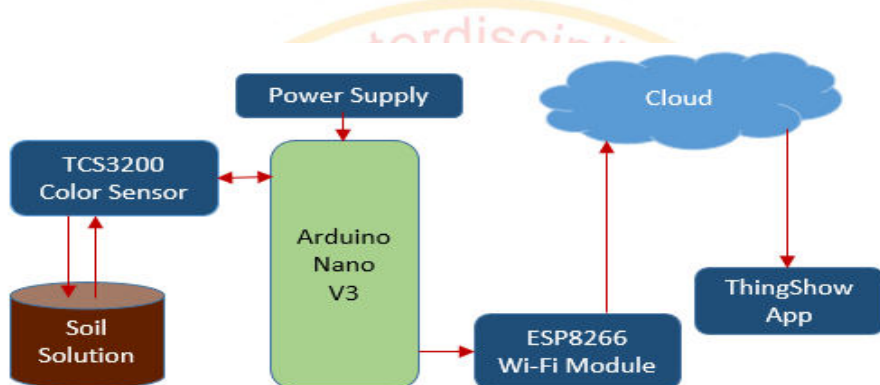
As we discuss the above said issue to resolve we design, Colorimetric Technique Based Soil Fertility Detection System. In this system, the color sensor works by illuminating white light on soil aqueous solution sample and measure the intensity of reflected light with the help of 8x8 photo-diode chip available in TCS3200

sensor. The microcontroller helps to uphold the intensity of light which is falling on soil sample, also helps to store the resultant values to cloud with the help of ESP8266 Wi-Fi module.



System Block Diagram

To detect the presence of nutrients in the soil by using colorimetric technique. First we make the aqueous solutions with the help of different chemicals reagents. Then using color sensor we detects the nutrients present in the soil.



A. SYSTEM REQUIREMENT

Arduino Nano V3:

Arduino NANO V3 is the open source tiniest Embedded Development board launched by Arduino based on Atmega328 SMD Package Microcontroller. Also, is a Surface stand Breadboard Friendly board integrated with Mini USB Port.

Specifications:-

- Operating Voltage: 5 V
- Digital I/O Pins: 14, Analog Input Pins: 08
- DC Current per I/O Pin: 40 mA
- Flash Memory: 32 KB

Color Sensor TCS3200:

The TCS3200, Color Sensor programmable color light-to-frequency converters that comes with silicon photodiodes and a current-to-frequency converter on a single CMOS IC. The output is a square wave and frequency directly proportional to light intensity. [8]



The colors of the visible light spectrum

Color	Wavelength interval	Frequency interval
Red	~ 700–635 nm	~ 430–480 THz
Orange	~ 635–590 nm	~ 480–510 THz
Yellow	~ 590–560 nm	~ 510–540 THz
Green	~ 560–520 nm	~ 540–580 THz
Cyan	~ 520–490 nm	~ 580–610 THz
Blue	~ 490–450 nm	~ 610–670 THz
Violet or Purple	~ 450–400 nm	~ 670–750 THz

Table 1. Pin values for activation of Photodiode filters. [8]

S2	S3	PHOTODIODE TYPE
L	L	Red
L	H	Blue
H	L	Clear (No Filter)
H	H	Green

ESP8266 Wi-Fi Module:

The ESP8266 is a low-cost Wi-Fi module, have built-in TCP/IP networking software, and microcontroller capability. Each ESP8266 module comes pre-programmed with an AT command can be change its baud rate by calibrating it with the help of AT commands.



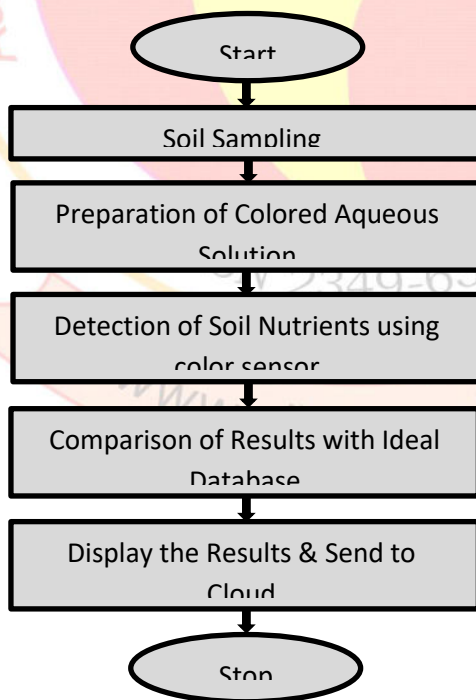
B. Making Of Aqueous Solutions

The aqueous solution is made with the help of soil testing kit with standard procedure.

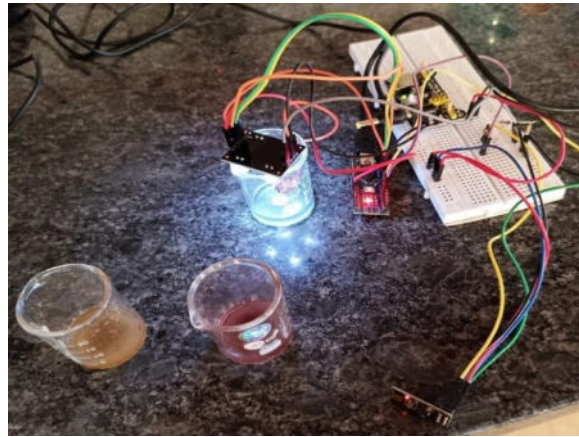


C. WORKING FLOW

CHART:



D.CIRCUIT DESIGN

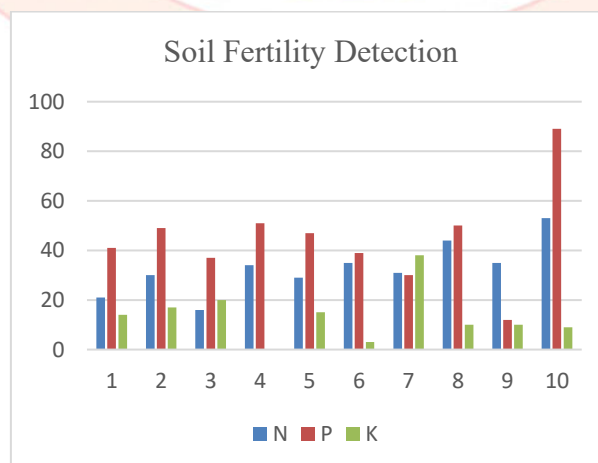
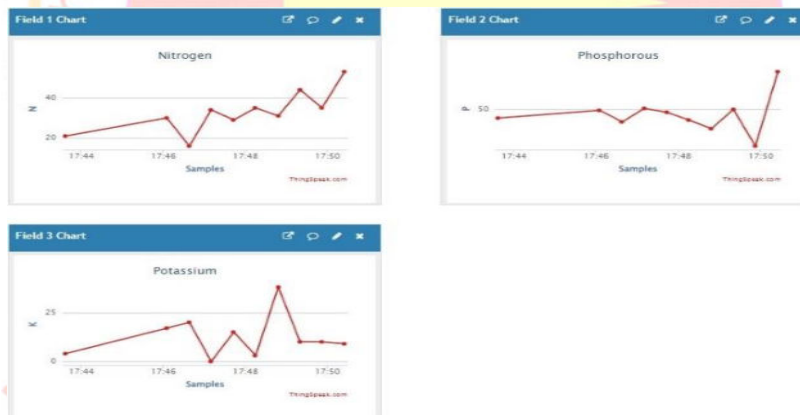


III.Results & Discussion

Table 2. Threshold color intensity values. [6]

Nutri.	Low	Medium	High
N	$x < 15$	$15 < x \leq 20$	$20 < x \leq 25$
P	$16 < x \leq 20$	$20 < x \leq 35$	$35 < x \leq 50$
K	$20 < x \leq 25$	$25 < x \leq 40$	$50 < x \leq 60$

By taking all adaptive measures we have used 2cm fixed distance between sensor & solution and we get sample results as below.



The above bar graph shows the different samples we have tested from different areas & found NPK values are changes from one area to another area.

Also the threshold color intensity values for N, P, K contents in the soil are described in Table 2. Which provides the scope of color intensity values in form of low, medium and high for N, P, K.

IV. Conclusions

This research concludes that, we have successfully developed a real time IoT enabled soil fertility detection system. This research will definitely reduce the farmer's time as well as money for soil fertility testing. Also help them to decide amount of fertilizers to be added in the soil according to the real time availability of the nutrients like N, P and K in the soil.

V. Future Scope

By extending this research can be possible to predict suitable crops according the nutrients are available in the soil. Also an atmospheric parameters effect can be observed on soil fertility. Therefore, the farmers can take necessity action towards their crop yield.

VI. Acknowledgement

The authors would like to acknowledge for the financial assistance from the UGC-MANF, New Delhi, in the form of Junior Research Fellowship (JRF) and Senior Research Fellowship (SRF), which supported the study.

VII. Reference

1. A. T. Madhumathi R and Shruthi R, "Soil NPK and Moisture analysis using Wireless Sensor Networks," 11th Int. Conf. Comput. Commun. Netw. Technol. ICCCNT) ., 2020.
2. M. E. H. Chowdhury, M. B. Hossain, T. Adhikary, M. M. Toufikur Rahman, and M. A. Razzaque, "Remote analysis of soil macronutrients using optical sensor for precision agriculture," Int. J. Appl. Sci. Eng., vol. 14, no. 2, pp. 87–99, 2016.
3. T. Adhikary, A. K. Das, M. A. Razzaque, M. E. H. Chowdhury, and S. Parvin, "Test implementation of a sensor device for measuring soil macronutrients," Proc. 2015 Int. Conf. Netw. Syst. Secur. NSysS 2015, 2015.
4. L. Vedpathak, P. Salape, and S. Naik, "An Automated Agricultural Robot," Int. J. Adv. Res. Comput. Commun. Eng., vol. 4, no. 3, pp. 66–67, 2015.
5. Wikipedia, "Plant nutrition." https://en.wikipedia.org/wiki/Plant_nutrition#:~:text=In relatively large amounts%2C the,%2C the so-called micronutrients.
6. D. V Ramane, S. S. Patil, and A. D. Shaligram, "Detection of NPK nutrients of soil using Fiber Optic Sensor," Int. J. Res. Advent Technol. ACGT, no. February, pp. 13–14, 2015.
7. Department of Agriculture & Cooperation Ministry of Agriculture Government of India, "Soil Testing in India," 2011.
8. TAOS, "TCS3200, TCS3210 Programmable Color Light-To-Frequency Converter," The Lumenology, no. 972, pp. 1–14, 2009.
9. Y. Kulkarni, K. K. Warhade, and S. Bahekar, "Primary Nutrients Determination in the Soil Using UV Spectroscopy," Int. J. Emerg. Eng. Res. Technol., vol. 2, no. 2, pp. 198–204, 2014.
10. M. B. Nagori, "Application of Colorimetry to determine Soil Fertility through Naive Bayes Classification Algorithm," 2018 9th Int. Conf. Comput. Commun. Netw. Technol., pp. 1–6, 2018.
11. S. Sayed, B. Rahman, I. Ahmed, and F. Ahmed, "An IoT Based Model of a Nitrogen Detection System for Soil Samples," 2020.
12. G. M. . and S. U. A. Kunhimohammed C.K , Muhammed Saifudeen K.K, Sahna S, "12 Automatic Color Sorting Machine Using TCS230 Color Sensor And PIC Microcontroller.pdf," Int. J. Res. Innov. Sci. Technol., vol. 2, no. 2, pp. 33–38, 2015.
13. Mr. S. Gaikwad, and Int, "Measurement of NPK, Temperature, Moisture, Humidity using WSN," J. Eng. Res. Appl. www.ijera.com ISSN, vol. 5, no. 83, pp. 2248–962284, 2015.
14. D. Vadalia, M. Vaity, K. Tawate, D. Kapse, S. V. Sem, and C. Engg, "Real Time soil fertility analyzer and crop prediction," Int. Res. J. Eng. Technol., vol. 4, no. 3, pp. 3–5, 2017.
15. R. Sindhuja and B. Krithiga, "Soil Nutrient Identification Using Arduino," Asian J. Appl. Sci. Technol., vol. 1, no. 4, pp. 40–42, 2017.

(SJIF) Impact Factor-7.675

ISSN-2272-4308

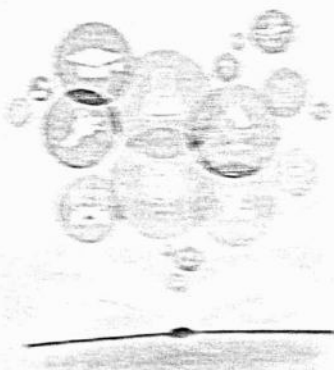
B.Aadhar

Peer-Reviewed & Refreed Indexed

Multidisciplinary International Research Journal

August-2021

SPECIAL ISSUE CCXVIII (2018)



Chief Editor
Prof. Virag S. Gawande
Director
Aadhar Social
Research & Development
Training Institute Amravati

Editor:
Dr. Dinesh W. Nishit
Principal
Sant Gadge Maharaj
Art's Comm. & Collage,
Walgun, Dist. Amravati.

Executive Editor :
Dr. Sanjay J. Kothari
Head, Deptt. of Economics,
G. S. Tompe Arts Comm. Sci. College,
Chandur Bazar Dist. Amravati

The Journal is indexed in:

Scientific Journal Impact Factor (SJIF)

Cosmos Impact Factor (CIF)

International Impact Factor Services (IIFS)



Impact Factor – 7.675

ISSN – 2278-9308

B.Aadhar

Peer-Reviewed & Refereed Indexed
Multidisciplinary International Research Journal

August-2021

ISSUE No- (CCCVIII) 308

Sciences, Social Sciences, Commerce,
Education, Language & Law

Prof. Virag.S.Gawande

Chief Editor

Director

Aadhar Social Research &, Development Training Institute, Amravati.

Dr.Dinesh W.Nichit

Editor

Principal,

Sant Gadge Maharaj Art's Comm,Sci Collage, Walgaon.Dist. Amravati.

Dr.Sanjay J. Kothari

Head, Deptt. of Economics, G.S.Tompe Arts Comm,Sci Collage

Chandur Bazar Dist. Amravati

Aadhar International Publication

For Details Visit To : www.aadharsocial.com

© All rights reserved with the authors & publisher

40	मुलांच्या सर्वांगिण विकासासाठी जैविक व शैक्षणिक पालकत्व प्रा.गौरी चंद्रशेखर चिंचोळकर	191
41	Micro – Finance As A Tool For Rural Development Mr. Guruprasad Mohan Kulkarni / Dr.R.S.Nilpankar	193
42	संत तुकाराम सविता तेजराव शिंगणे	198
43	शेतकरी आत्महत्या - एक चिंतन डॉ. एस. एच. भैरम	202
44	भारतीय कृषी नीती एवं किसानो के प्रश्न – एक अभ्यास डॉ. रवि ना. साखरे	208
45	जागतिकीकरण आणि मराठी लोकनाट्ये डॉ.चंद्रकुमार राहुले	211
46	Problem Faced Indian Agriculture Hemlata Ramesh Selokar	214
47	Indian English : The Rise Of Dalit And Innovative Literature Anil Jaydeo Ganvir	218
48	Women's Rights: Status and Goal The Role of Media in Women Empowerment Prof. Dr. Shirish S Nakhate	223
49	राजी सेठ की कहानियाँ डॉ. शेखर खडसे	228

राजी सेठ की कहानियाँ डॉ. शेखर खडसे

गो.से. विज्ञान, कला एवं वाणिज्य महाविद्यालय खामगांव

समकालीन हिंदी कथा साहित्य में राजी सेठ एक सशक्त हस्ताक्षर रही हैं! वे अपने युग और समाज के प्रति अत्यन्त ही संवेदनशील कथाकार हैं! एक कथाकार के रूप में हिंदी साहित्य की उनका योगदान सर्वाधिक महत्वपूर्ण रहा है!

वे ऐसी महिलावादी नहीं हैं जिन्हें पुरुष नकारात्मक उपस्थिति लगता है, बल्कि पुरुष-मैत्री आधुनिक स्त्री की तरह राजीजी अपने लेखन में ना तो स्त्री होने से इनकार करती हैं और न उसे नाट करती हैं, बल्कि अपने नैसर्गिक रूप में उसे चित्रित कर अपने समकाल के समान कथाकारों के बीच यह साबित कर दिया है कि कथा ना स्त्री की होती है, न पुरुष की, वह तो एक समग्र रचना कर्म है, चिंतन संवेदन, अनुभूति, दर्शन और विचार है, शिल्प और सौंदर्य है और एक पूरा जीवन है! कथा हमारे देश की ही नहीं पूरे संसार की एक लोकव्यापी परंपरा है! हर समय में यह परंपरा जारी रही है, कथा कभी नहीं मरी है!

जीवन को समग्र और संपूर्ण छवियों में पकड़ने की कोशिश, "किसका इतिहास" संग्रह की अनेक कहानियों में दिखाई देती है! स्त्री अपनी विभिन्न भूमिकाओं में यहां मौजूद हैं— माँ सहचरी, पत्नी, सभी रूपों में उसके दर्द और दुविधा को उकेरा गया है! उतनी दूर माँ, खेल की नीशा, गलम होता पंचतंत्र तो व्यस्त-अव्यस्त माँ, 'किसका इतिहास' 'बाहरी लोग' 'रूको इंजार हुसैन' की स्त्रियाँ पुरुषों की शक्ति और सपनों के बीच नितांत अकेली हो जाती हैं! इस संग्रह में माँ की विभिन्न छवियाँ दिखाई देती हैं! इन कहानियों में स्त्री का विमर्श नहीं उस की वेदना मौजूद है, पीड़ा और प्रतिरोध के स्वर को एक साथ बुलंद करती हुई! श्राजी ने भारत-पाक विभाजन को नए घातक पर उठाने की कोशिश अपनी कहानियों में की है! 'किसका इतिहास' संग्रह में भी 'किसका इतिहास' 'बाहरी लोग' 'रूको इंजार हुसैन' नामक तीनों कहानियों की विषयवस्तु वही है! "राजी सेठ की उक्त तीनों कहानियाँ ठीक अर्थों में विभाजन की त्रासदी की कहानियाँ न होकर उसकी स्मृती की कहानियाँ हैं— वह स्मृती जिसे दर-किनार कर निकालना मुशिलक है! वे स्मृती के अस्तित्व के साथ तदाकर हो जाती हैं! अस्तित्व है तो स्मृती की भयावहता उस पर छाई रहेगी!"

'किसका इतिहास' में सर्वाधिक प्रभावशाली चार कहानियाँ हैं यत्रामुक्त, किसके पक्ष में, उतनी दूर और रूको इंजार हुसैन ! ये संवेदन के अलग स्तर की कहानियाँ हैं! विक्की और बेल्ला की कथा परिवारों के यथार्थ की कथा कही जा सकती है लेकिन यह कथा आखिर किसके पक्ष में? यहाँ एक प्रकार से पुरुष-छल की मानसिकता का भी राजीजी ने उस मनोविज्ञान के साथ उद्घाटन किया है जो स्त्री को स्त्री होने की मजबूरी में दिखता है! विक्की के अंदर आत्मक्षेप से उत्पन्न याचनाभाव एक पत्नी या स्त्री का वह पक्ष है जिसे बेल्ला पैदा करती है उसे विक्की झेल नहीं पाता है! इस प्रकार कहानी में बेटा शहीद हुआ है लेकिन मनुष्यता और जीवन शहीद नहीं हुआ है, वह तो मतलब जारी है! इस कहानी में केवल आभुपणों का समर्पण नहीं है बल्कि विश्वास की भूमि पर त्याग और तपस्या का समय है!

'गमे हयात ने मारा' यह कहानी संग्रह राजी सेठ की एक ऐसी अस्मिता का कथा संग्रह है जिसमें स्त्री केवल व्याकरणिक लिंग संज्ञा नहीं है बल्कि यह सृष्टि-संज्ञा है, जीवन संज्ञा है और अपने अनुभूत क्षणों की सार्वभौम कर देने की संवेदन संज्ञा है!

मुलाकात में आत्मसम्मान और स्वाभिमान ने उपजी ऐसी कथा है जिसमें जब विभाजन तिरोहित होकर मनुष्यात आकर खड़ी हो जाती है तो लगता है विभाजन कितनी बड़ी क्रूरता है जो मनुष्य से उसका मनुष्यपन ही छीन लेती है! गमे हयात ने मारा की चत्री की कथा तो एक ऐसी कथा है जहाँ अहंकार, प्रेम और आत्मीयता के तिरोह पर एक स्त्री खड़ी कर दी गयी है और अंततः मरे कोई भी देह से, मगर हर बार आत्मा से तो स्त्री को ही मरना होता है! स्त्री की सहनशीलता और सामर्थ्य का एक उदाहरण राजी सेठ ने सहकर्मी में दिया है! पुतले



सारांशतः यह कहा जा सकता है कि राजी सेठ का लेखन कुसंस्कार तथा स्त्रियों और मानव-विरोधी हरकतों को लेकर सेक्रिय हो उठता है! स्त्री की मानसिकता एवं आकांक्षाओं से परिचित कराते हुए उसके स्वतंत्र अस्तित्व को भी रेखांकित किया है! आज की युवा मानसिकता की प्रवृत्ति, विकृती के विविध आयामों को लेखिकाने स्पष्ट किया है! स्त्री-विमर्ष की तथा तथाकथित चिल्लहट के बीच राजीजी की कहानियाँ शांति के साथ खामोशी, गहराई और गंभीरता के साथ स्त्री मन के आयामों को खोजती पढ़ती चली जाती है!

वैश्विकरण इस दौर में इस देश की युवा पीढ़ी जब घर आँगन को छोड़ विदेशी जर्मन सभ्यता और संस्कृति के प्रति आकर्षित हो रही है! उसे अपने आस-पास की और वैश्विक हकीकत से परिचित कराने की कोशिश भी इस कहानी के माध्यम से हुई है!

संदर्भ सूची :

१. स्मकालीन भारतीय साहित्य—सितम्बर—अक्तुबर, २००२
२. राजी सेठ: संवेदना का दर्शन — रमेश दवे, पृ २४३
३. महिला उपन्यासकार — डॉ. मधु सिंधु, पृ १३५
४. मार्था का देश -- राजी सेठ. पृ ३२
५. महिला उपन्यासकार — डॉ. मधु सिंधु, पृ ८५

(SJIF) Impact Factor-7.675

ISSN-2278-9308

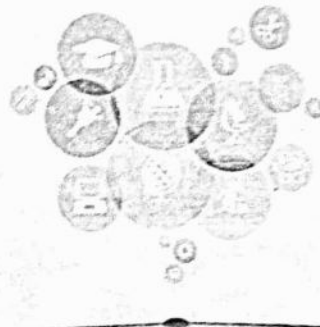
B.Aadhar

Peer-Reviewed & Refereed Indexed

Multidisciplinary International Research Journal

December-2021

ISSUE No- (CCCXXXII) 332



Chief Editor
Prof. Virag S. Gawande
Director
Aadhar Social
Research & Development
Training Institute Amravati

Editor:
Dr.Dinesh W.Nichit
Principal
Sant Gadge Maharaj
Art's Comm,Sci Collage,
Walgaon.Dist. Amravati.

Executive Editor :
Dr.Sanjay J. Kothari
Head, Deptt. of Economics,
G.S.Tompe ArtsComm,Sci Collage
Chandur Bazar Dist. Amravati

The Journal is indexed in:

Scientific Journal Impact Factor (SJIF)

Cosmos Impact Factor (CIF)

International Impact Factor Services (IIFS)

B.Aadhar

Peer-Reviewed & Refereed Indexed
Multidisciplinary International Research Journal

December-2021

ISSUE No- (CCCXXXII) 332

Sciences, Social Sciences, Commerce,
Education, Language & Law

Prof. Virag.S.Gawande
Chief Editor
Director

Aadhar Social Research & Development Training Institute, Amravati.

Dr.Dinesh W.Nichit
Editor
Principal,

Sant Gadge Maharaj Art's Comm.Sci Collage, Walgaon.Dist. Amravati.

Dr.Sanjay J. Kothari
Head, Deptt. of Economics, G.S.Tompe Arts Comm,Sci Collage
Chandur Bazar Dist. Amravati

Aadhar International Publication

For Details Visit To : www.aadharsocial.com

© All rights reserved with the authors & publisher

19	डॉ. बाबासाहेब आंबेडकर आणि स्त्री-पुरुष समानता	डॉ. सुजाता रामदासजी नाईक	85
20	भारत एक उभरती वैश्विक राजनीतिक शक्ति : एक अध्ययन	नीरज कुमार	91
21	महिला और पुरुष खिलाड़ियों का सांघीक खेलों में चयनित मानसीक घटकों का तुलनात्मक अध्ययन	डॉ. योगेश निर्मळ	97
22	समर्थांचे मनाचे श्लोक : एक आकलन	डॉ. उज्ज्वला आर. पाटील	106
23	संशोधनात ग्रंथालयाची भूमिका	डॉ. रंजना भा. व्यवहारे	111
24	जागतिक तापमान वाढ : पर्यावरणीय परिणाम व उपाय	प्रा. संजय एस. लांडगे	115
25	सद्यःस्थितीतील हवामान बदलाच्या संदर्भात पृथ्वीच्या भूशास्त्रीय काळातील हवामान बदलाचा अभ्यास	प्रा. संजीव वि. भुयार	117
26	बालकांना लिंगभाव (स्त्री-पुरुष) समानतेचे शिक्षण - एक अध्ययन	प्रा. शैलेश बाबुराव पाटील	125
27	अमरावती जिल्ह्यातील तूर पीक उत्पादकता व उत्पादकेतील बदल : भौगोलिक अध्ययन	प्रा. नारायण गोविंदराव सोनुले	128
28	कोव्हिड-१९ चा भारतीय समाजावर झालेला आर्थिक परिणाम	डॉ. सुधीर सुरेश ढोरे	133
29	संत जनाबाईंचे परमार्थ जीवन आणि विद्वलभक्तों एक विवेचन	डॉ. देवेंद्र एस. तातोडे,	137
30	दलित साहित्य और सामाजिक चेतना की अवधारणा	डॉ. शेखर खडसे	140
31	महाराष्ट्रातील मानवी प्रगतीचा चिकित्सक अभ्यास	डॉ. वैशाली धनराज पाटील	144
32	प्रखर राष्ट्रवादी डॉ. बाबासाहेब आंबेडकर	डॉ. दिपाली डी. भावे	150
33	आधुनिक भारताच्या स्वातंत्र्य चळवळीत वृत्तपत्रांचे योगदान	श्रीमती सीमा जालिंदर भोसले	155
34	डॉ. बाबासाहेब आंबेडकरांच्या न्यायविषयक संकल्पनेचे अध्ययन .	डॉ. दिनेश वा. निचित	159
35	Same-Sex Relationship in India : A Socio - Legal Perspective	Dr. Kiran Sharma	165
36	An Overview of Internet Marketing	Dr. Rajesh M. Deshmukh	170
37	Population growth, urbanization and its Effect on cities	Dr. Megha Sawarkar, / Mr. Amit Shrawan Ghodmare	173

दलित साहित्य और सामाजिक चेतना की अवधारणा डॉ. शंकर खड्गे

जी.जे. विमान, कला एवं वाणिज्य महाविद्यालय, कामनावा.

साहित्य जीवन का सत्य शिबि और दर्शन है। साहित्य जीवन को समझने के लिए साहित्य का अर्थ जानना है। साहित्य कहलाने से साहित्य है साहित्य वह सत्य सत्य है जो सत्य से निकलकर हृदय हो ही प्रभावित करता है। साहित्य को अर्थक विचार है जो विस्तृत धारणा में प्रभावित होकर जनमानस को प्रभावित कर रहा है।

साहित्यकारों के इस विस्तृत धारणा पर दलित साहित्य को दर्शा करके १० से ६० वर्षों से जाते पर है परन्तु इनके बीच तो हमें सैकड़ों वर्षों पूर्व से विचारों होते हैं, ये दलित साहित्य की अवधारणा पर कुछ वर्षों पहले इसके पहले यह जान लेना आवश्यक है जो दलित शब्द की व्याख्या किस प्रकार की गई।

इस शब्द की व्युत्पत्ति को लेकर विद्वानों में अनेक मतभेद है इतलिये प्रारंभ में दलित शब्द की व्युत्पत्ति के आधार पर इसका अर्थ जान लेना अनिवार्य है दलित शब्द की व्युत्पत्ति संस्कृत धातु 'दल' से हुई है विभिन्न शब्दकोषों में विभिन्न अर्थ दिये गये हैं जैसे:-

- १) दल (अंक) विकलना, फटना, खंडित होना, विधा होना
 दल (सक) चूर्ण करना टुकड़े करना विदारना
 दात (नयु) सैन्य, लष्कर, पत्र, पत्ती ।

- २) दल व दलित
 दलित- दू वस्त्र ओपन, स्मिस्ट क्लेव फ्रैन्क
 'दलित हृदयं गाढोद्योगं विदा तुन विधते'
 (वेदनाओं के कारण हृदय के टुकड़े होते हैं नाश नहीं)
 दलित- ब्रोकन, आर्न ब्रस्ट रेट् स्मिस्ट
 हिन्दी शब्दकोषों में भी दलित शब्द के अर्थ निम्नानुसार है
 दलित- मसला, रौंदा या कुचला हुआ।
 दलित- विदीर्ण, कुचला हुआ ।
 दलित- जो दबाया गया हो अथवा जिसे पनपने या बटने न दिया गया हो
 दलित- विनिष्ट किया गया हो

इस शब्द के अर्थों से स्पष्ट है की शोषित और कुचले हुये लागों को लीवन की कहानी उनका दर्द, पीडा समस्याओं का चित्रण जिस साहित्य में प्रतिबिम्बित होता है वही



दलित साहित्य है। जिसमें जातीयता और साम्प्रदायिकता की गंध नहीं है, मुझे यहाँ कबोर की पंक्तियों याद आ रही हैं।

दुर्बल को न सताइये, जाकी मोठी हाय।

मरे बैल के चाम से लौह भस्म हो जाय।?

इस दलित साहित्य के बीज शताब्दियों पहले बपन हो चुके थे परन्तु आज उसका व्यापक अर्थ न लेकर उसे संकुचित घेरे में बांधने का प्रयास किया जा रहा है। हमारी भारतीय संस्कृति अत्यन्त प्राचीन है, इस दलित साहित्य के प्रणेताओं की कई कहानियों वेदों से लेकर आज तक बिखरी हैं।

नर्तकी गर्भ संभूतो वशिष्ठी नाम महाऋषिः ।

तपसा ब्राम्हणो जातः तस्मात् जार्तिनकारणम् ।

अर्थात् वशिष्ठ का जन्म एक नर्तकी से हुआ था। आज जो हिन्दू संस्कृति खड़ी है, उसका मुलाधार धार्मिक ग्रंथ है और धार्मिक मुल ग्रंथों का आधार तत्कालीन समाज व्यवस्था है। तत्कालीन व्यवस्था वर्ण व्यवस्थापर आधारित थी तब कोई भी अपने कर्मा के अनुसार भक्ति तथा तपस्या से सामाजिक से सामाजिक में उच्चकोटि का स्थान प्राप्त कर सकता है दलित की व्याख्या भी दो प्रकार से की जा सकती है।

दलित का व्यापक अर्थ:-

अर्थ में दलित किसी विशेष जाति के अर्थोंमें नहीं हैं मनुष्य की पतितावस्था, दुरावस्था तथा उनकी लाचारी पर लिखा साहित्य है। ऐसे भी मनुष्य जो स्वयं के अज्ञान के कारण आपने अधिकारों को न जानता हुआ दासता को स्वीकार करता है व्यापक अर्थ में दयनीय और कष्टमय जीवन बिताने वाले सभी मजदूर, किसान, नौकर, लाचार नारियों, भूमिहीन बेघर विपन्नावस्था में जीते सभी मनुष्य दलित है। डॉ प्रभाकर माचवे ने अपने विचार व्यक्त करते हुये कहा है दलित या ऐसे व्यक्तियों का समूह जिनका मनुष्य के नाते जीने का हक छिन लिया है जन्म से ही जिसके हिस्से इस समाज व्यवस्था में केवल एक ही प्रकार का जीवन आया है, वे दलित हैं। ऐसा व्यक्ति भारत का ही नहीं बल्कि अमेरिका का भी हो सकता है इस प्रकार दलित की परिभाषा में अमेरिका में काला, गौरा लाल एशियाई देशों में काला गौरा पीला आते हैं अपने देप के अस्पृश्य आदिवासी शोषित पीडित आते हैं। इस दृष्टिकोण में दलित अर्थ की व्यापकता विश्वात्मक है।

दलित का संकुचित अर्थ:-

'दलित' शब्द के बारे में संकुचित या सीमित दृष्टि से सोचने वालों का कहना है कि अस्पृश्य या हरिजन आदिवासी ही दलित है, जिन्हें युगों से उच्चर्णियों ने कुचला है ऐसा करके

इसे सोनित क्षेत्र को पिछरी में रखने की कोशिश की गई है। परन्तु क्या हिन्दू ही दलित है विश्व के हर देश में एक शोषित वर्ग है जो हर कौम हर नस्ल में है।

हिन्दी साहित्य में दलित चेतना की अवधारणा:-

दलित साहित्य को आगे बढ़ाने के मराठी साहित्य ने पजल की है परन्तु १९७२ में कमलेश्वरजी ने सामान्तर साहित्य की तुलना करते हुये कहा है की "हमारी आस्था जीवन में है और जीवन को वहन करने वाला केन्द्र है मामूली आदमी और उसी से सम्बन्ध है हमारे लेखन और जीवन की आकांक्षा है। जो दलित साहित्य को विश्व तक ले आ जाती है।

हिन्दी उपन्यासों और कहानियों में जो दलित विश्लेषण मिलता है, उसके आधार पर दलित शक्ति का प्रतिबिम्ब नजर आता है। प्रेमचंद गांधी युग के कलाकार होने से दलितोद्धार, द्वार दलितों कापतित जीवन उच्च वर्ग धनावानों द्वारा दलितों का शोषण, उनके चिन्तन का विषय रहा है दलित जीवन से संबंधित उनका कथा साहित्य भी है उनके उपन्यासों में रंगभूमि 'कापाकल्प' कर्मभूमि और गोदान उपेक्षित दलित जीवन के चित्र प्रस्तुत करते हैं।

रंगभूमि का सुरदास दरिद्री चमार है। गोदान की सिलिया दलित अबलाओं पर होने वाले अत्याचार और संकटमय जीवन का प्रतिनिधित्व करती है। इसी तरह पांडेय बेचन उग्र 'शराबी' उपन्यास भगवतोषरण वर्मा के 'भूले बिसरे चित्र' का गेंदालाल एक दलित पात्र है निराला का 'निरूपना' उपन्यास में निराला ने जूते पॉलिश के व्यवसाय को श्रेष्ठ बताते पुरानी परम्परागत नान्यताओं को उद्ध्वस्त करने का प्रयत्न किया है निराला का ही 'कुस्ली भाट' के कुल्फी की दलित पाठशाला दलित चेतना का उदाहरण है इसी प्रकार इसी परम्परा में आगे चलकर दलित को केन्द्र में रखकर अनेक उपन्यास और कहानियाँ लिखे गये।

दलित साहित्य के बारे में मेरा मत है की दलित जीवन की कहानी जिस किसी भी साहित्य में रसात्मक ढंग से कह सकेंगे वह साहित्य ही होगा दलित साहित्य। जिस साहित्य में व्यक्ति और समस्त मानव की आत्मा का अपमान और क्रंदन उसकी लजन लवं उससे आग की वर्षा हो वही दलित साहित्य का उपादान है। दलित कवि मिट्टी के समीप रहने वाला व्यक्ति हैपंक से निकलने वाल पंकज है लंछिन जीवन के रक्त में घुला स्पन्दन है।

अंतमे स्वातंत्रोत्तर काल में भारतीय दलित की वही स्थिती तो नहीं जो अनादि काल से चली आ रही थी किन्तु समग्र रूपसे कोई गुणात्मक परिवर्तन नहीं हुआ है। साहित्य में मिला चाहिये अतः स्पष्ट है की दलित वर्ग की सीमा के अन्तर्गत केवल अस्पृश्य हरिजन एवं निम्न जाति ही नहीं है। बल्कि सामाजिक आर्थिक एवं राजनीतिक दृष्टि से पिछडा हुआ शोषित वर्ग चाहे वह किसी भी जाति या लिंग का क्यों न हो दलित वर्ग के अनतर्गत आता है हिन्दी का गद्य साहित्य 'दलित वर्ग के चित्रण में अधिक समूह है।'

संदर्भ सुची

१. एकलव्य— डॉ. राजकुमार वर्मा पृ. २२२
२. एकलव्य — डॉ. राजकुमार वर्मा पृ.१८
३. ग्राम्या (सौंदर्य कला) सुमित्रानंदनपंत पृ. ७७
४. संस्कृति के चार अध्याय —दिनकर पृ. ११४
५. दलित साहित्य — श्री नेरूरकर पृ. ७८

(SJIF) Impact Factor-7.675

ISSN-2272-4308

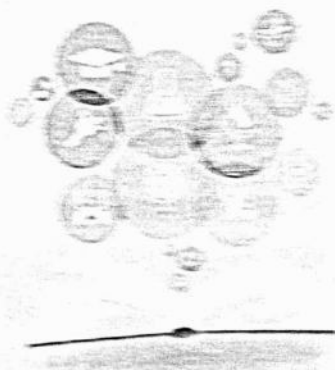
B.Aadhar

Peer-Reviewed & Refreed Indexed

Multidisciplinary International Research Journal

August-2021

SPECIAL ISSUE CCXVIII (2018)



Chief Editor
Prof. Virag S. Gawande
Director
Aadhar Social
Research & Development
Training Institute Amravati

Editor:
Dr. Dinesh W. Nishit
Principal
Sant Gadge Maharaj
Art's Comm. & Collage,
Walgun, Dist. Amravati.

Executive Editor :
Dr. Sanjay J. Kothari
Head, Deptt. of Economics,
G.S. Tompe Arts Comm. Sci. College,
Chandur Bazar Dist. Amravati

The Journal is indexed in:

Scientific Journal Impact Factor (SJIF)

Cosmos Impact Factor (CIF)

International Impact Factor Services (IIFS)



Impact Factor – 7.675

ISSN – 2278-9308

B.Aadhar

Peer-Reviewed & Refereed Indexed
Multidisciplinary International Research Journal

August-2021

ISSUE No- (CCCVIII) 308

Sciences, Social Sciences, Commerce,
Education, Language & Law

Prof. Virag.S.Gawande

Chief Editor

Director

Aadhar Social Research &, Development Training Institute, Amravati.

Dr.Dinesh W.Nichit

Editor

Principal,

Sant Gadge Maharaj Art's Comm,Sci Collage, Walgaon.Dist. Amravati.

Dr.Sanjay J. Kothari

Head, Deptt. of Economics, G.S.Tompe Arts Comm,Sci Collage

Chandur Bazar Dist. Amravati

Aadhar International Publication

For Details Visit To : www.aadharsocial.com

© All rights reserved with the authors & publisher

40	मुलांच्या सर्वांगिण विकासासाठी जैविक व शैक्षणिक पालकत्व प्रा.गौरी चंद्रशेखर चिंचोळकर	191
41	Micro – Finance As A Tool For Rural Development Mr. Guruprasad Mohan Kulkarni / Dr.R.S.Nilpankar	193
42	संत तुकाराम सविता तेजराव शिंगणे	198
43	शेतकरी आत्महत्या - एक चिंतन डॉ. एस. एच. भैरम	202
44	भारतीय कृषी नीती एवं किसानो के प्रश्न – एक अभ्यास डॉ. रवि ना. साखरे	208
45	जागतिकीकरण आणि मराठी लोकनाट्ये डॉ.चंद्रकुमार राहुले	211
46	Problem Faced Indian Agriculture Hemlata Ramesh Selokar	214
47	Indian English : The Rise Of Dalit And Innovative Literature Anil Jaydeo Ganvir	218
48	Women's Rights: Status and Goal The Role of Media in Women Empowerment Prof. Dr. Shirish S Nakhate	223
49	राजी सेठ की कहानियाँ डॉ. शेखर खडसे	228

राजी सेठ की कहानियाँ डॉ. शेखर खडसे

गो.से. विज्ञान, कला एवं वाणिज्य महाविद्यालय खामगांव

समकालीन हिंदी कथा साहित्य में राजी सेठ एक सशक्त हस्ताक्षर रही हैं! वे अपने युग और समाज के प्रति अत्यन्त ही संवेदनशील कथाकार हैं! एक कथाकार के रूप में हिंदी साहित्य की उनका योगदान सर्वाधिक महत्वपूर्ण रहा है!

वे ऐसी महिलावादी नहीं हैं जिन्हें पुरूष नकारात्मक उपस्थिति लगता है, बल्कि पुरूष-मैत्री आधुनिक स्त्री की तरह राजीजी अपने लेखन में ना तो स्त्री होने से इनकार करती हैं और न उसे नाट करती हैं, बल्कि अपने नैसर्गिक रूप में उसे चित्रित कर अपने समकाल के समान कथाकारों के बीच यह साबित कर दिया है कि कथा ना स्त्री की होती है, न पुरूष की, वह तो एक समग्र रचना कर्म है, चिंतन संवेदन, अनुभूति, दर्शन और विचार है, शिल्प और सौंदर्य है और एक पूरा जीवन है! कथा हमारे देश की ही नहीं पूरे संसार की एक लोकव्यापी परंपरा है! हर समय में यह परंपरा जारी रही है, कथा कभी नहीं मरी है!

जीवन को समग्र और संपूर्ण छवियों में पकड़ने की कोशिश, "किसका इतिहास" संग्रह की अनेक कहानियों में दिखाई देती है! स्त्री अपनी विभिन्न भूमिकाओं में यहां मौजूद हैं— माँ सहचरी, पत्नी, सभी रूपों में उसके दर्द और दुविधा को उकेरा गया है! उतनी दूर माँ, खेल की नीशा, गलम होता पंचतंत्र तो व्यस्त-अव्यस्त माँ, 'किसका इतिहास' 'बाहरी लोग' 'रूको इंजार हुसैन' की स्त्रियाँ पुरूषों की शक्ति और सपनों के बीच नितांत अकेली हो जाती हैं! इस संग्रह में माँ की विभिन्न छवियाँ दिखाई देती हैं! इन कहानियों में स्त्री का विमर्श नहीं उस की वेदना मौजूद है, पीड़ा और प्रतिरोध के स्वर को एक साथ बुलंद करती हुई! श्राजी ने भारत-पाक विभाजन को नए घातक पर उठाने की कोशिश अपनी कहानियों में की है! 'किसका इतिहास' संग्रह में भी 'किसका इतिहास' 'बाहरी लोग' 'रूको इंजार हुसैन' नामक तीनों कहानियों की विषयवस्तु वही है! "राजी सेठ की उक्त तीनों कहानियाँ ठीक अर्थों में विभाजन की त्रासदी की कहानियाँ न होकर उसकी स्मृती की कहानियाँ हैं— वह स्मृती जिसे दर-किनार कर निकालना मुशिलक है! वे स्मृती के अस्तित्व के साथ तदाकर हो जाती हैं! अस्तित्व है तो स्मृती की भयावहता उस पर छाई रहेगी!"

'किसका इतिहास' में सर्वाधिक प्रभावशाली चार कहानियाँ हैं यत्रामुक्त, किसके पक्ष में, उतनी दूर और रूको इंजार हुसैन ! ये संवेदन के अलग स्तर की कहानियाँ हैं! विक्की और बेल्ला की कथा परिवारों के यथार्थ की कथा कही जा सकती है लेकिन यह कथा आखिर किसके पक्ष में? यहाँ एक प्रकार से पुरूष- छल की मानसिकता का भी राजीजी ने उस मनोविज्ञान के साथ उद्घाटन किया है जो स्त्री को स्त्री होने की मजबूरी में दिखता है! विक्की के अंदर आत्मक्षेप से उत्पन्न याचनाभाव एक पत्नी या स्त्री का वह पक्ष है जिसे बेल्ला पैदा करती है उसे विक्की झेल नहीं पाता है! इस प्रकार कहानी में बेटा शहीद हुआ है लेकिन मनुष्यता और जीवन शहीद नहीं हुआ है, वह तो मतत जारी है! इस कहानी में केवल आभुपणों का समर्पण नहीं है बल्कि विश्वास की भूमि पर त्याग और तपस्या का समय है!

'गमे हयात ने मारा' यह कहानी संग्रह राजी सेठ की एक ऐसी अस्मिता का कथा संग्रह है जिसमें स्त्री केवल व्याकरणिक लिंग संज्ञा नहीं है बल्कि यह सृष्टि-संज्ञा है, जीवन संज्ञा है और अपने अनुभूत क्षणों की सार्वभौम कर देने की संवेदन संज्ञा है!

मुलाकात में आत्मसम्मान और स्वाभिमान ने उपजी ऐसी कथा है जिसमें जब विभाजन तिरोहित होकर मनुष्यात आकर खड़ी हो जाती है तो लगता है विभाजन कितनी बड़ी क्रूरता है जो मनुष्य से उसका मनुष्यपन ही छीन लेती है! गमे हयात ने मारा की चत्री की कथा तो एक ऐसी कथा है जहाँ अहंकार, प्रेम और आत्मीयता के तिरोह पर एक स्त्री खड़ी कर दी गयी है और अंततः मरे कोई भी देह से, मगर हर बार आत्मा से तो स्त्री को ही मरना होता है! स्त्री की सहनशीलता और सामर्थ्य का एक उदाहरण राजी सेठ ने सहकर्मी में दिया है! पुतले



सारांशतः यह कहा जा सकता है कि राजी सेठ का लेखन कुसंस्कार तथा स्त्रियों और मानव-विरोधी हरकतों को लेकर सेक्रिय हो उठता है! स्त्री की मानसिकता एवं आकांक्षाओं से परिचित कराते हुए उसके स्वतंत्र अस्तित्व को भी रेखांकित किया है! आज की युवा मानसिकता की प्रवृत्ति, विकृती के विविध आयामों को लेखिकाने स्पष्ट किया है! स्त्री-विमर्ष की तथा तथाकथित चिल्लहट के बीच राजीजी की कहानियाँ शांति के साथ खामोशी, गहराई और गंभीरता के साथ स्त्री मन के आयामों को खोजती पढ़ती चली जाती है!

वैश्विकरण इस दौर में इस देश की युवा पीढ़ी जब घर आँगन को छोड़ विदेशी जर्मन सभ्यता और संस्कृति के प्रति आकर्षित हो रही है! उसे अपने आस-पास की और वैश्विक हकीकत से परिचित कराने की कोशिश भी इस कहानी के माध्यम से हुई है!

संदर्भ सूची :

१. स्मकालीन भारतीय साहित्य—सितम्बर—अक्तुबर, २००२
२. राजी सेठ: संवेदना का दर्शन — रमेश दवे, पृ २४३
३. महिला उपन्यासकार — डॉ. मधु सिंधु, पृ १३५
४. मार्था का देश -- राजी सेठ. पृ ३२
५. महिला उपन्यासकार — डॉ. मधु सिंधु, पृ ८५

ॐ मित्र ५१८

21-22

साहित्य, कला आणि लोकसंस्कृतीला वाहिलेले त्रैमासिक

तिफण

वर्ष १२ वे, अंक - दुसरा; जुलै-ऑगस्ट-सप्टेंबर २०२१

UGC Care Listed Journal
ISSN 2231 - 573X

● संपादक ●

डॉ. शिवाजी हुसे

पत्ता : संपादक, तिफण, 'शिवार', श्रीराम कॉलनी,
हिवरखेडा रोड, कन्नड, जि. औरंगाबाद - ४३११०३.

मो. ९९०४००३९९८

अनुक्रमणिका

अ. क्र.	शीर्षक / लेखक-संशोधक	पृ. क्र.
1.	लोककवी वामनदादा कर्डक : व्यक्ती आणि कार्य - प्रा. डॉ. रमेश श्रीरंग औताडे	1 - 6
2.	लोककवी वामनदादा कर्डक यांची लोकगीते - प्रा. डॉ. दिलीप सावंत	7 - 10
3.	वामनदादा कर्डक यांच्या गीतातील बौध्द तत्वज्ञान - डॉ. लोणे राजेंद्रकुमार लक्ष्मणराव	11 - 13
4.	लोककवी वामनदादा कर्डक यांच्या कवितेतील बौध्द तत्वज्ञान - डॉ. उत्तम हरिबा कांबळे	14 - 17
5.	वामनदादा कर्डक यांच्या कवितेतील सामाजिकता - सुनील स कांबळे/ डॉ. संदिप बनसोडे	18 - 22
6.	वामनदादा कर्डक : व्यक्ती आणि कार्य - प्रा. डॉ. प्रेमला मुखेडकर	23 - 26
7.	वामनदादा कर्डक यांच्या कवितेतील सामाजिकता व नाटकीयता - डॉ. संदीप अ. बनसोडे / रामेश्वर गिरधर देवरे	27 - 29
8.	लोककवी वामनदादा कर्डक : व्यक्ती आणि कार्य - शारदा किशन धामणगावकर	30 - 33
9.	लोककवी वामनदादा कर्डकांच्या बुध्दगीतांचे सामाजिक महत्त्व - प्रा. डॉ. शिवाजी संभाजी गायकवाड	34 - 36
10.	लोककवी वामनदादा कर्डक यांची महिला गीते - प्रा. डॉ. आशा सोपान गिरी	37 - 40
11. ✓	वामन दादाकर्डक यांच्या कवितेतील सामाजिकता आणि निसर्ग प्रतिमा - प्रा. विक्रम उ. मोरे	41 - 44
12.	वामनदादा कर्डक : नव्या युगाचा शाहीर - प्रा. देवेंद्र बाबुराव निकम, प्रा. डॉ. म. सु. पगारे	45 - 48
13.	मानवतावादी कवी वामनदादा कर्डक यांच्या काव्यातील मुल्यविचार - प्रा. डॉ. बाळासाहेब लिहिणार	49 - 52
14.	लोककवी वामनदादा कर्डक यांच्या लोकगीतांचा अभ्यास - प्रा. डॉ. डी. ए. पाटील	53 - 56
15.	वामनदादा कर्डक यांच्या लोकगीतांतील सामाजिकता - डॉ. नवनाथ ज्ञानोबा पवळे	57 - 59
16.	वामनदादा कर्डक यांच्या कवितेतील सामाजिकता - प्रा. डॉ. कोतमे धिरजकुमार सत्येकाल	60 - 62



वामन दादाकर्डक यांच्या कवितेतील सामाजिकता आणि निसर्ग प्रतिमा

- प्रा. विक्रम उ. मोरे

सहाय्यक प्राध्या. (मराठी विभाग)

गो. से. विज्ञान, कलाआणि वाणिज्य, महाविद्यालय

खामगांव जि. बुलढाणा

वामन कर्डक यांचा 'लोककवी' असा उल्लेखकेला जातो. त्यांनी आपल्या गीतकाव्यातून प्रगतीशील, पुरोगामी भुमिका घेऊन मानवमुक्तीचा विचार मांडला आहे. शोषण मुक्तीच्या लढ्यातील अग्रणी महापुरूष डॉ. बाबासाहेब आंबेडकर यांच्या शोषण मुक्तीचा विचार जनमानसात रूजविण्याचे अतुलनिय कार्य वामनदादांनी केले आहे त्यांनी जवळपास पाच हजारांच्या वर गीत रचनाकेली आहे. 'वाटचाल', 'मोहोळ' हे गीत वामनाचे असे त्यांची पुस्तके त्यांच्या चाहत्यांनी प्रकाशित केली आहे. त्यांची कविता जनसामान्यांच्या भाषेत असून समाजातील अनिष्ट रूढी, प्रथा, परंपरायांचे भंजन करणारी कविता आहे. कष्टकरी श्रमजीवी माणूसहा त्यांच्या कवितेतील विषय आहे. समाजातील जातीय भेद, अस्पृश्यता, अन्याय, शोषण, अत्याचार, धर्माच्या नावावर चालणारे कर्मकांड माणसामाणसांत भेद करणारी विषमताधिष्ठित समाजरचना त्यांनी नाकारली आहे. फुले, शाहू, आंबेडकर यांचा विचाराचा वारसा पुढे नेणारीत्यांची कविता मानव मुक्तीच्या लढ्यातील तेजपुंज आहे. त्यांची कविता सामाजिक अंगाने अर्थपूर्ण असून खऱ्या अर्थाने सामाजिकठरते.

ते लोकशाहीर, लोकगायक, लोककवी म्हणून प्रसिद्ध होते. पोवाडा, लावणी, वगनाट्य, भीमगीते, भावगीते, लोकगीते आणि सिनेमा गीतांची त्यांनी रचनाकेली आहे. आंबेडकरी चळवळीतील शाहीरांचे ते मुकुटमणीहोते त्यांच्या कवितेकडे जाणीवपूर्वक पाहिले असता, त्यांच्या कवितेतील विविधांगी सामाजिक जाणिवा आविष्कृतहोतांना दिसून येतात त्यांच्या कवितेतून सामाजिकताही दिसून येते विविध निसर्ग प्रतिमांचा सहजतेने वापर करूनत्यांची कविता सामाजिकतेच्या अनुषंगाने बहरून येते. त्यांच्या कवितेतील निसर्गप्रतिमांचा अनोखा वापर हे त्यांच्या कवितेचे वैशिष्ट्यपूर्ण निराळेपण आहे. प्रस्तुतशोध निबंधात वामन दादांच्या कवितेतील सामाजिकता आणि ओघाने येणाऱ्या निसर्गप्रतिमा यांचे वेगळेपण शोधण्याचा प्रस्तुत प्रयत्न आहे.

युगप्रवर्तक डॉ. आंबेडकर यांच्या विचारांचा वामन दादांवर प्रचंड प्रभाव होता. भीमयुगाची युगवाणी निळ्या नभापर्यंत उतुंग उंचीवर नेणारामहान प्रतिभावंत महाकवी वामनदादा कर्डकहोते. जशी तुकोबाची गाथा तसे वामनाचे गीत आहे. त्यांची कविता विषमतेने बरबटलेल्या समाजव्यवस्थेवर आसूड उगारते डॉ. बाबासाहेब आंबेडकर यांच्या सामाजिक चळवळीतील प्राणवायू म्हणजेत्यांची कविता होय उचनिचतेच्या धार्मिक, सामाजिक, गुलामीत जखडलेल्या गुलामांनात्यांच्या गुलामीची जाणिव करून द्या म्हणजेते बंड करून उठतील असा आत्मभान देणारा व स्वाभिमान जागृतकरणारा डॉ. आंबेडकरांचा विचार घराघरात झोपडी-वस्ती तांड्यावर गीताच्या माध्यमातून आंबेडकरी विचाराचे धन वाटणारा कवी वामन कर्डकहोय. येथील कुजलेल्या जातीग्रस्त समाजात, स्वाभिमानाचे स्फुल्लिंग पेटविणारा आंबेडकरी विचाराची ज्वाळा

कवितेत म्हणतात,

नीच नितीचा कापू गळा
तया रक्ताचा लेवू टिळा
मंजूळा पाजळ आपला विळा उचल हो रणमौदानी

अशाप्रकारे, नीचक्रूर, विषमतेला ते आव्हान देतात. माणसाचे 'माणूसपण' नाकारणारी अनिष्ट रूढीकापून फेकून द्या अशी संघर्षमय भाषा त्यांची कविता करते सर्वप्रकारचे मानवाचे शोषण थांबले पाहिजे निखळ माणूस म्हणूनच माणसाचे मोल व्हावे असेच त्यांना वाटते. त्यांनी आपल्या गीतांच्या माध्यमातून लोकांच्या मध्ये जागृती निर्माण केली अन्याय आणि अत्याचाराला चिरडून टाकण्याची भाषा त्यांची कविता करते. ते म्हणतात,

अन्यायाची चिरा चांबडी
चिरा करा चिंधड्या
नाहीतर भरा हाती बांगड्या
सुरंगसाधे जसे फोडती, उतुंग डोंगरकडे
तसेच, पाडागाडा येथे, नीच नीतीचे मढे
त्याच मद्यावर शांतीखातर उंच उभारा गुह्या
नाहीतर हाती भरा बांगड्या

अशी ओजस्ववाणी सामाजिक गुलामीला धिक्कारण्याची भाषा त्यांच्या कवितेतून येताना दिसते. मनु प्रणित घोर अन्याय अत्याचार मुरदाड माणसचं सहन करतात. परंतु, दलितांनी मनुप्रणित विचारांना जाळून टाकले पाहिजे बाबासाहेबांनी सांगितलेला मानवतावादी विचार पुढे नेटाने नेला पाहिजे असे त्यांना वाटते. अन्यायापुढे नम्र होऊ नका असेही ते सांगतात मिंधेपणा, लाचारी, दुबळेपणा, टाकून दिला पाहिजे. येथील जातीच्या नावावर होणारी भांडण थांबायला पाहिजे असेही त्यांना वाटते. आजच्या समाजातील अस्वस्थ समाज जीवन पाहून, दिवसा ढवळ्या आई-बहिणीची इज्जत लुटली जात असतांना स्वाभिमानाचे गाणे म्हणणारे माणूस थंडकसा बसला असा सवाल ते करतात. आत्मपरिक्षण करणारी आत्मटिकाही त्यांची कविता करते.

मला चीड येत नाही, हाच माझ गुन्हा
दोष देऊकुणा, सांगा दोष देऊकुणा
माझ्या आई-बहिणीला नागवती ठाईठाई
मला चीड येत नाही . . .
मीच माझ्या अब्रुची पाही विटंबना
दोष देऊ कुणा

अशा प्रकारची हतबलतेची जाणिव त्यांच्या कवितेतून येते.

समाजात एकोपा वाढावा आणि एकजूट राहावी. समाजाच्या एकीत फार मोठी शक्ती आहे. म्हणून त्यांची कविता सामाजिक एकात्मतेच्या संदेशही देते. ते म्हणतात

सांगू किती मी दादा
एकतेने येथे नांदा
यारेसारे भाऊ भाऊ
एकाताटामध्ये जेवू
प्रेम भावे येथे राहू
तुटलेले दुवे सांधा

लोककवी वामनदादा कर्डक : व्यक्ती आणि वाङ्मय / 42

एकतेने येथे नांदा

अशा प्रकारचा सामाजिक भाव भाव मांडणारीत्यांची कविता खऱ्या अर्थाने सामाजिक आहे. हिंदू, मुस्लिम, शीख, ईसाई हे धर्म माणसाने निर्माण केले आहे. त्यांच्या बंधुपरिव्यवहार व्हावा अशा प्रकारचीसुचक भावना त्यांच्या कवितेतून आविष्कृत होते. आजमाणसानेखूप प्रगतीकेली गगणचुंबी इमारती बांधल्या कारखानेकाढले, तंत्रज्ञानही वाढले, परंतुसमाजाची सामाजिक मानसिकता आम्ही बदलू शकलो नाही. आजही जातीय दंगली घडविल्या जातात. सामान्य कष्टकरी माणसाला दारिद्र्याचेओझे वाहतच जीवन जगावे लागते. दैन्यदास्य अफाट वाढले असूनकायदा आणि सुव्यवस्था अविश्वसनीय झाली आहे. 'बळी तो कान पिळी' अशी उद्दाम प्रवृत्ती दिवसेंदिवस वाढत आहे. महापुरूषांचे विचार पायदळी तुडवून हुकुमशाही वरचढ होतांना दिसते. सामाजिक लोकशाही उरलीच नाही. असे अलीकडचे चित्र आहे. अस्वस्थ आणि भयग्रस्त समाज व्यवस्थेत दुर्बलांना हतबलतेचे जीवन जगावे लागते. शोषणकरणांरारवर्ग शोषणकरतच राहतो. सामान्य जणाला नागविले जाते. याबाबत वामन करडक आपल्या कवितेतून सांगतात

बळी इथला बळाच्या बळाने
नागवितो आम्हांला छळाने
मारदेऊन पुसती आम्हांला
खूप बुजली की नाही वळाची

अशा प्रकारे अजूनही अत्याचाराचेवळ सुकले नाही हा दळभद्रेपणा समाजातील विषमता वाढवते. गरीब आणि श्रीमंतमध्ये फार मोठी दरी निर्माण झाली असून सामान्य जणांना जगण्याचा प्रश्नाने छळले आहे एकीकडेश्रीमंतीचा महापुरु वाहतो आहे आणि गरीब माणूस भाकरीसाठी तळमळतो आहे. अशी अघोरी विषमता स्पष्टकरतांनाते व्यवस्थेला सवाल करतात.

सांगा आम्हांला बिरला, बाटा, टाटा कुठाय गं
सांगा धनाचा साठा, पण आमचा वाटा कुठाय गं

अशा प्रकारे ज्ञान आणि धनापासून वंचित असणाऱ्यासमाजाचे दुःखते मांडतातश्रमकरी माणसाच्या कष्टातूनचहे जग सुंदर झाले आहे परंतु, त्याच्या वाटेला सुख येतांना दिसत नाही हे स्वातंत्र्यांतर घडत आहे. याबाबत ते म्हणतात,

स्वातंत्र्याचा अर्थ हाकळू द्या
आता तरीगरीबाला घास मिळू द्या

अशा प्रकारे सामाजिक प्रश्नाचे चिंतन करणारीत्यांची कविता सामाजिक कविता होय.

डॉ. आंबेडकरांचा शोषण मुक्तीचा विचार तळागळातील माणसापर्यंत नेण्याचे महत्त्वपूर्ण कार्य कवी वामन कर्डक्यांनीकेले आहे. डॉ. आंबेडकरांनी उभारलेले सामाजिक लढे गावागावात पोहोचण्याचेकाम वामनाच्या धारदार लेखणीनेकेले आहे. त्यांची कविता सामाजिक अंगानेसमृद्ध आहे
वामन दादा यांच्या कवितेतील निसर्गप्रतिमा

आंबेडकरी संस्कृतीला जनमानसात कवितेच्या माध्यमातून घेऊन जाणारे वामनदादा करडक यांची कविता सामाजिक अंगानेश्रेष्ठतर आहेच पण, तिचे श्रेष्ठतव निसर्गप्रतिमांनी भरीव केले आहे. त्यांच्या कवितेतून सामाजिक प्रश्न मांडत असतांना त्यांची कविता सहजच निसर्गप्रतिमांचा वापर होतो डॉ. आंबेडकरांचा वौचारिक मळाकसा फुलुन आणि बहरून आला आहे. त्याबाबत, भाष्य करतांना वामनदादा म्हणतात

पाहा पाहा मंजुळातो माझ्या भीमरायाचा मळा
रानमाळ असता भिमाने देह येथे झिजविला
शिंपडून रक्ताचे पाणी शिवार हा भिजविला
इमानी माणसं बहरीली कणसं, नाचतो जोंधळा
पाहा पाहा मंजुळा...

लोककवी वामनदादा कर्डक : व्यक्ती आणि वाङ्मय / 43

अशा प्रकारे डॉ. आंबेडकरांच्या विचारांचा मळा फुलविणारा कवी वामन यांच्या कवितेत निसर्ग अवतारतो दुष्काळ, भुक याबाबत आक्रोशहीत्यांची कविता करते.

घरटे घरटे उदास येथे चारा मागते
लई तापली दुपार येथे चारा मागते

अशा प्रकारचा निसर्ग प्रतिमांचा वौशिष्ट्यपूर्ण वापर करून दुष्काळात भुकेने तळमळणारा लोकांची वेदना त्यांची कविता मांडते त्यांच्या कवितेतील निसर्ग समृद्ध असून हर्षभाव व्यक्त होतो. हराळी, केळी, आंबे, करदळी अशा निसर्गातील शब्द प्रतिमांचवापर करून कवी वामन यांची कविता निसर्गाचेसौंदर्य फुलवते आजूबाजूला डोलणारी पिके माणसाला मनमोहितकरतात. त्यांची निसर्ग संवेदना निसर्गाची सोबत करते. ते म्हणतात,

नवं हे नव्हाळीच, शेतहे गव्हाळीचं
शेजारी पिक डोलेसाळीचं
देणं हे माय माझ्या काळीचं

अशा प्रकारे काळ्या आईचे उपकार मानणारी त्यांची कविता निसर्गाचे लोभणीय दर्शन घडविते. काळ्या आईचे उपकार मानते. सकाळच्या सोनेरी पहाटेचे वर्णन करतांना त्यांची कविता निखळ निसर्ग चित्रित करते.

शुक्र, चांदणी येई वर वर
हलकेहलके उजळे अंबर
उषा सखीचा गालावरती
अमलू लागे छटा लालसर

अशा प्रकारे सकाळची जीवसृष्टी अशी जागृत होते. ती कोवळ्या कोवळ्या उन्हाचे लाल छटा निसर्गभर पसरतात. सुर्यकिरणासोबत नृत्य करणाऱ्या लता, वेली सकाळच्या विलोभणीय पहाटेचे सौंदर्य दर्शन घडवितात.

तांबूसले नभ निळे उजळे आभाळ
नाचे वेली पायामध्ये बांधुनिया चाळ
उठपेरी आली आली सोनेरी सकाळ

अशा सोनेरी सकाळचे वर्णन करणारी त्यांची कविता निसर्गाच्या प्रेमात पडतांना दिसते निसर्गाशी घट्ट नाते जोडणारी त्यांची कविता अनोखी आणि वौशिष्ट्यपूर्ण आहे.

सारांश -

वामनदादा कर्डक्यांच्या कवितेतील सामाजिकता आणि निसर्ग प्रतिमा यांचे घट्ट नाते आहे. सामाजिकतेबरोबरच निसर्गाशी अनुबंध जोडणाऱ्या निसर्ग प्रतिमांचा अन्वयार्थ वामन दादांनी आपल्या कवितेत लावला आहे त्यांची कविता निसर्गाशी नातेतर जोडतेच परंतु, सामाजिक प्रश्नही उजागर करतांना निसर्ग प्रतिमांच्या प्रभावीपणे वापर ते करतात मराठी काव्य विश्वामध्ये वामन दादांची कविता सामाजिकतेच्या अनुषंगाने निसर्गाचा अनव्यार्थ जोडण्याची वेगळीच रीत वामन दादांच्या कवितेने निर्माण केली. त्यांच्या कवितेने मराठी काव्य विश्वात अनोखे समाज विश्व व निसर्गाचा दुर्मिळ अनुबंध स्पष्टकेला आहे.

संदर्भ ग्रंथ:-

1. भवरे, महेंद्र, मराठी कवितेच्या नव्या दिशा - लोक वाङ्मय गृह प्रकाशन, दुआ, 2011, मुंबई पृष्ठक्र. 40,42.
2. ठाकुर, भगवान, आंबेडकरी साहित्य: स्थिती आणि स्थित्यांतरे, आकाश प्रकाशन, 2009, नागपुर, पृष्ठक्र. 77
3. डॉ. मेश्राम, योगेंद्र, दलितसाहित्या उदगम आणि विकास, मंगेश प्रकाशन, 1998 नागपुर, पृष्ठक्र. 185.
4. शेलार, सुधाकर, मराठीसाहित्यकाही लेखन बंध, स्वरूप प्रकाशन, 2013, औरंगाबाद, पृष्ठक्र. 140.
5. ठाकुर, भगवान, आंबेडकरी जलसे, सुगावा प्रकाशन, 2005, पुणे, पृष्ठ 69



Impact Factor - 8.572 (SJIF)
ISSN - 2278 -9308

FEBRUARY 2022
ISSUE NO. (CCCXXXVI) 336

B.Aadhar

Peer - Reviewed & Refereed Indexed

MULTIDISCIPLINARY INTERNATIONAL RESEARCH JOURNAL



संपादक

डॉ. जगदीश साबू

डॉ. शिवाजी नागरे

डॉ. श्रीकृष्ण काकडे



This Journal is Indexed in
Scientific Journal Impact Factor (SJIF)
Cosmos Impact Factor (CIF)
International Impact Factor Services (IIFS)



For Details Visit to : www.aadharsocial.com

Aadhar PUBLICATIONS



Scanned with OKEN Scanner



60	'शहर आत्महत्या करायचं म्हणतंय' : अगतिक महानगराचे आत्मवृत्त स्वप्नील राजेश इंगोले	287
61	'नंतर आलेले लोक'मधील स्त्री-प्रश्नांची चर्चा सायली सुरेश पिलणकर	292
62	आदिवासी निहाली भाषेचे बदलते स्वरूप प्रा. डॉ. श्रीकृष्ण काकडे / रश्मी जगदीशराव सातफळे	295
63	माधव कोंडविलकर यांच्या कादंबऱ्यातील बदलत्या जीवन जाणिवा डॉ. शिवाजी नीळकंठ नागरे/प्रा. सुवर्णा किसनराव घोषे	299
64	जागतिकीकरण आणि ग्रामीण कवितेतील जाणिवांचे संदर्भ प्रा. विक्रम उखर्डा मोरे	304
65	'ताई मी कलेक्टर व्हयनू' व 'आयदान' मधील नवजाणिवा प्रा.डॉ.शिवाजी नागरे / प्रकाश गंगाराम बावणे	309
66	'शिंपल्यातील मोती' या काव्यसंग्रहातील सर्जनशील जाणिवांचा वेध प्रा.पुरुषोत्तम प्र.सूर्य	314
67	स्त्रियांच्याआत्मचरित्रातील नवजाणिवा प्रा. डॉ. श्रीकृष्ण काकडे / उज्वला समाधान डांगे	318
68	कवी इंद्रजित भालेराव यांच्या काव्यातील बदलती ग्रामीण मानसिकता प्रा. शशिकांत काळे	323
69	नवकवितेतील कृषीजाणीवेची बदलती रूपे डॉ.श्रीकृष्ण वामन पदमणे	326
70	अण्णा भाऊ साठे : जीवन आणि कार्य नवजाणिवांचा आविष्कार प्रा. डॉ. वैशाली बाबुराव कोटंबे	328
71	आदिवासी साहित्यातील बदलते स्त्रीजीवन प्रा.चिन्नना चालुरकर	332
72	नव्वदोत्तर मराठी बालसाहित्यातील नवजाणिवा प्रा. डॉ. सौ. ममता इंगोले / प्रा. ए. बी. भावसार	335
73	एकविसाव्या शतकातील ग्रामीण कवितेतील नवजाणिवा प्रा. डॉ. श्रीकृष्ण काकडे / कु. शताब्दी विलासराव धांडे	340
74	संत साहित्यातील नवजाणीवा कु. प्राची विनोदराव मेंडे	344
75	नंदा खरे यांच्या साहित्यातील नवजाणिवा अभिजित अशोक इंगळे	347
76	हत्तीवादी साहित्य प्रा. सीमा चिमणकर	350
77	जागतिकीकरणाचा परिणाम व साहित्यातील गंभीरता सहा. प्रा. तुळशिराम शंकर कांबळे	352

जागतिकीकरण आणि ग्रामीण कवितेतील जाणिवांचे संदर्भ
प्रा. विक्रम उखर्डा मोरे
सहाय्यक प्राध्यापक, मराठी विभाग गो.से. विज्ञान, कला आणि वाणिज्य
महाविद्यालय, खामगांव जि. बुलढाणा ४४४३०३ महाराष्ट्र

उद्दिष्टे :- १. ग्रामीण कवितेत जागतिकीकरणाच्या प्रभावाचा संदर्भ शोधने
२. ग्रामीण कवितेतील बदलत्या जीवन जाणिवांचा शोध घेणे.

प्रस्तावना :

एकविसाव्या शतकाच्या पहिल्या दशकात भारतीय समाज जिजनातील विविध क्षेत्रात स्थित्यंतरे घडून आली. त्याचे प्रमुख कारण १९९० च्या गॅट करार, या निमित्त्याने भारत देशाने स्विकारलेले मुक्त अर्थव्यवस्थेचे धोरण. या धोरणाचा परिणाम म्हणजे जागतिकीकरण होय. यातूनच 'ग्लोबल व्हिलेज' ही कल्पना पुढे आली. भारत देशातील कृषीसंस्कृतीचा विचार करता या धोरणाचे काही चांगले परिणाम. जरी झालेत तरी, काही दुरगामी परिणाम मोठ्याप्रमाणात भारतीय समाज जीवनावर झालेत. भारत हा कृषीप्रधान देश जवळपास ७० टक्के लोक शेतीवर आधारित जीवन जगतात ग्रामव्यवस्था ही कृषीआधारित असल्याने मुक्त व्यापार धोरण आयात-निर्यातीवरची सैल बंधने, यामुळे शेतीव्यावसायला दुर्गती आली. जागतिकीकरणाच्या प्रभावाने भारतीय कृषीसंस्कृती सर्वांगाने प्रभावित झाली. भारतीयांच्या सामाजिक, राजकीय, आर्थिक, पर्यावरणीय जिजनात स्थित्यांतरे लक्षणीय रूपाने घडून आली. त्याला वाडःमयीही अपवाद नाही. मानवी जीवनावर प्रभाव टाकणाऱ्या जागतिकीकरणाने विकासाची भ्रामक कल्पना भारतीयांच्या गळी उतरवली, पाणी, विज, रस्ते, ह्या विकासाला गती देणाऱ्या गोष्टी मोफत दिल्याजातील, सर्वांची प्रगती साधली जाईल, बेकारी कमी होईल, रोजगार संधी वाढतील, जागतिक बाजारात शेतमाल नेता येईल व शेतकऱ्यांच्या परंपरागत समस्या, प्रश्न पुर्णपणे सुटतील. असा फसगत करणारा विचार प्रसारित करण्यात आला. परंतु खरे पाहता हा मोठा भ्रम आहे. हे आजच्या तरूण लेखकांना, कविंना वाटू लागले त्याचे मुलगामी चिंतण करणारी व आत्मभान आलेली आजची नवलेखकांची १९९० नंतरची पिढी, जागतिकीकरणाच्या प्रभावाने अस्वस्थ झाली. आपल्या पायाखाली ठेवलेला जागतिकीकरणाच्या बेमालूम विस्तवाने आपण पोळून, भाजून जात आहो याची अस्वस्थ जाणीव लेखकांना होऊ लागली. जागतिकीकरणाने कृषीसंस्कृतीला प्रभावीत केले या विषयीचे चिंतन नवशिक्षित झालेल्या ग्रामीण लेखक करू लागले. नव पिढीतील संवेदनशिल लेखक, कविंनी ग्रामिण वास्तवाची अस्वस्थ जाणीव आपल्या कवितेतून अभिव्यक्त केली. त्यामध्ये ग्रामीण संवेदनशिल कविचा उल्लेख करवा लागेल. नामवंत कविपैकी इंद्रजीत भालेराव, श्रीकांत देशमुख, जगदीश कदम, बालाजी मदन इंगळे, संतोष पद्रमाकर पवार, केशव देशमुख, पेशवयी पाटेकर, कल्पना दुधाळ, कैलास दौड, अशोक कोळी, सुरेश शिंदे, उत्तम बावस्कर, अजिम नवाजराही, प्रतिमा इंगोले सदानंद देशमुख, नारायण सुमंत, गोविंद पाटील अशी कितीतरी नावे, ग्रामीण कविंची सांगता येतील. जागतिकीकरणाच्या संदर्भाने पडझड होत असलेल्या ग्रामीण विश्वासचे वास्तव बदलते जगणे-भोगणे चित्रितकरणारे हे संवेदनशिल कवि ढासळलेल्या ग्रामसंस्कृती बाबत, मुलगामी चिंतन सजगतेने मांडताना दिसून येतात. कवि जो काळ जगत, अनुभवत असतो त्याचे भले बुरे पडसाद कविमनावर होतच असतात. काळा हा बदलतच असतो. काळानुरूप होणारे बदल, येणारे अनुभव, त्यातूनच जाणिवा निर्माण होतात अस्वस्थता संवेदनक्षम मनाला टोचत असतात.



त्यात भोवतालचे जगणे, त्याचा परिसर तिथे घडणाऱ्या घटना ह्या आपल्या कवितेचा विषय करावा असे अनेकांना वाटत असते. कालसंगत परिवर्तनाला कवेत घेणारी काळानुरूप 'जाणिव' हीच कवितेला जन्मास घालते. या अनुषंगाने १९९० नंतरच्या भारतीय समाज जीवनावर, कृषीजगावर, कृषीसंस्कृतीवर प्रभाव टाकणाऱ्या जागतिकीकरणाच्या संदर्भाने मराठी ग्रामीण कवितेत आविष्कृत होणारी कालसंगत जानिवेचे स्वरूप समजून घेण्याच्या उद्देशाने प्रस्तुत शोध निबंधाची मांडणी केली आहे. जागतिकीकरणाने मानवी जीवन प्रभावित केले आहे. तसेच भारतीय समाज व्यवस्थेतील विविध घटकांनाही त्याची बाधा काही अंशाने झाली. या साहित्य प्रवाहाचा विचार करता स्त्रीवादी, आदिवासी, दलित या साहित्यातील जीवन जाणिव ही प्रभावित झाल्या असल्या तरी, प्रस्तुत शोध निबंधामध्ये जागतिकीकरणाच्या अनुषंगाने प्रभावित झालेली ग्रामीण कवितेतील जाणिव या शोधलेखामध्ये विचारार्थ घेतलेली आहे.

बदलते ग्रामवास्तव, जीवन जाणिवांच्या अनुरोधाने प्रस्तुत विषय लक्षात घेण्याची मर्यादा या निबंधाची आहे.

जागतिकीकरण व ग्रामीण जाणिवेची कविता :-

जागतिकीकरणाने प्रभावित झालेले ग्रामजीवन कृषीसंस्कृतीच्या सर्वांगाने प्रभावित झाले आहे. कालसंगत घडणारे ग्रामीण जीवनातील परिवर्तन, सकारात्मक पेक्षा नकारात्मक जास्त आहे. जागतिकीकरणाची मुळात भूमिका ओरबडण्याची असून, मानवीविकासाला आकड्यात मोजणारी आहे. फक्त लुट करायची आणि सामान्य, कष्टकरी माणसाची जगण्याबाबत दमछाक कशी होईल आणि भांडवली व्यवस्थेचा तो गुलाम कसा होईल हेच जागतिकीकरणाची खुली नीती आहे. जागतिकीकरण म्हणजे काय हे सोपे करून सांगायचे झाल्यास शेतकरी जसा दंताळा काही वस्तुजमा करण्यासाठी वापरतो तेच रूप जागतिकीकरणाचे आहे. फक्त ओरबडा, सावटा, जमा करा आणि हतबल करून सोडा. सामान्य गरीब, कष्टकरी, मजूर, शेतकरी यांनी आबादाणीचा विचार करून नये, अशी निर्दयी शोषण व्यवस्था म्हणजे हे जागतिकीकरण. याचे अत्यंत दुरगामी परिणाम ग्रामसंस्कृती व समाज जीवनावर पडलेले आहेत. यामुळे मॉल कल्चर वाढत असून, महागाई वाढत आहे. शेती खर्चाचा मेळ नाहीसा झाल्याने शेतकरी अगतिक होऊन आत्महत्या करतो आहे. जागतिकीकरणाच्या नावाने रोवलेलं बुजगावन आत्महत्या करणाऱ्या शेतकऱ्याला खांदा देणारे आणि शेतजमिनीची 'वाट' लावणारे बकालपण आहे. दुःख, दारिद्र्य व शोषणाचा वारसा मिळालेल्या बळीराजाचा दररोज बळी घेतला जातो. त्यामुळे गावशिवाराला भकासपणा विकासाच्या गोड स्वप्नामुळे आला आहे. शेतकऱ्यांच्या घरादारात शेत शिवारात कॉपोरेट जगाने धुडंगुस घातला असून ग्रामीण जीवनात आकांत माजला आहे. निरागस निर्मळ जगणाऱ्या ग्रामीण माणसाची प्रेरणा व प्रवृत्ती कशी बदलते आहे. याचे वर्णन करतांना इंद्रजित भालेराव जागतिकीकरणाबाबत आपल्या कवितेत लिहतात.

जागतिकीकरणाचा एड्डींगचा डब्बा
कुणी धुतला माझ्या निर्मळ गंगेत
निरागस विहार करणाऱ्याच्या नाकात
कुणी आणून कोंबला अचानक आकांत

जागतिकीकरण म्हणजे एड्डीनचा डब्बा होय. ज्याने मरणाचा आकांत ओढवतो, भांडवलशाहीचा दुरगामी परिणाम भोगावा लागतो, खुला व्यापार भारतीय शेतकऱ्यांना कसा मारक ठरतो. आमचा शेतकरी ज्ञान विज्ञानाबाबत पुरेसा ज्ञानी नाही. बाजार त्याला कळत नाही आणि खुल्या व्यापारात त्याची फसगत होते. भांडवलशाहीचा दबावाने आयात-निर्यातीचे धोरण व्यापारी व भांडवलदार धार्जिने करार करून शेतकऱ्याला देशोधडीला लावले जाते. शेतकऱ्याचा घामाचे मोती



किती मातीमोल भावात विकावे लागतात. धड लागत खर्चही निघत नाही. अशी शेती, 'देखना इंडिया' कसा लूटून खाते याचे फसगतीचे चित्रण करतांना कवि नारायण सुमंत लिहतात.

मी देखणी मिस इंडिया

तुम्हा लुबाडण्याची मूर्तिमंत आयडिया
रोज वाकवते, झुकवते, माझे नाव भांडवलशाही
कर चुकवते, जकात चुकवते, जाहिरातीतून छान स्वप्न दाखवते.
राईचा पर्वत करते, छापिल किंमत हक्काने घेते
आणि शेतमालाचा लिलाव मांडून, कुणब्याले फाशी देते.

ही ग्रामवास्तावाची धग अधोरेखित करतांना भांडवलशाहीने शेतात रक्त आटवणाऱ्या दीन दुबळ्या कास्तकार शेतकऱ्याची कशी निराशा केली व शाईनिंग इंडियाने कशी शेतकरी कष्टकऱ्यांना फाशी घेण्याची वेळ आणली यांची दुःखत जाणिव जागतिककरणाच्या प्रभावाने कर्वींनी मांडली आहे. शेतकरी कष्टकरी माणसांचे जगणे हराम करणाऱ्या व्यवस्थेला कुठेतरी कृषीवंतांच्या जगण्याचा विचार करावा लागेल. या जगाला पोसणारा शेतकरी शोषणाचा परंपरागत बळी ठरतो. त्याला राजकारनी आश्वासनही देतात, परंतु त्याचा निवडणूकीपुरता केवळ वापर होतो, सहकार क्षेत्र, औद्योगिक क्षेत्र त्याचा शोषणावरच पोसले जाते, त्याला अंधरात ठेवूनच आयत-निर्यातचे धोरण टरवले जाते. सडक्या राजकारणा मागे लागून आजचे राजकारणी शेतकऱ्याचा शस्त्रासारखा कसा वापर करतात. नितीमत्ता हरवत चाललेल्या या समकाळात शेतकऱ्याच गन्धान खोट-खोट एकूण घेण्याच नाटक करणारे राजकारणी यांना प्रश्न विचारणारा शेतकरी आत्मभानावर येतो आहे, ही सुखद आशादायी जाणिवही ग्रामीण कवितेत व्यक्त होताला दिसून येते कवि म्हणतो,

पंतप्रधान म्हणाले, घेतलेल्या कर्जाच आणि कुटुंबाच नियोजन करता येत नाही
म्हणून शेतकरी आत्महत्या करतात, शेतकऱ्यांनी विचारलं

देशाच नियोजन जमलं नाही म्हणून, किती पंतप्रधानांनी आत्महत्या केल्या. ?

असा प्रश्न विचारणारी शेतकऱ्यांची पिढी उदयास येते आहे. जागतिकीकरणाच्या निखाऱ्याने शेतकऱ्यांना सजग व सावधान केल्याची जाणिव प्रस्तुत कवितेत चित्रीत होते. कृषीजगावर परिणाम करणाऱ्या समकालीन समाज वास्तवाचे भान ठेवणारे कवि नारायण सुमंत लिहतात की, जागतिकीकरणामुळे कृषीजन्माचे वाटोळे होत आहे. पेरायच बियाणं मल्टीनॅशनल कंपनीचं पेराय लागते. महागडी औषधे व किटकनाशके फवारावी लागतात. त्यातही बनावट औषधामुळे शेतकरी नागवला जातो. याबाबतचे चित्रण 'हंगाम' या कवितेत ते लिहतात,

बनावटी औषधाने, कोसळत्या बाजारभावाने

अन हरामखोर आयात-निर्यातीने

आणि भ्रष्टाचारी सिंचनाने

जोम धरताहेत फटवे

जागतिकरणामुळे भारतात परदेशी शेतीविषयक औषध कंपन्यांना व्यापार करण्याची मोकळीक भेटली आणि त्यांनी नफेखोरीसाठी ब्रॅंडेड बी-बियानांच्या व किटकनाशकांच्या नावाखाली भ्रष्टाचाराच सिंचन वाढवले. मातीशी खेळणाऱ्या शेतकऱ्याला मातीतच लोळवले. संवेदनाहिन बनत असलेली कॉर्पोरेट जमात शेतकऱ्यांचा शोषणाचा स्तर वाढवते ही जागतिकीकरणाची निदर्शनी देण आहे. जागतिकीकरणाच्या नावाने चांगभलं करणाऱ्या इंटरनॅशनल कंपन्यांना देशात परवानगी मिळाली त्यांचे उद्योग उभे करण्यासाठी शेतकऱ्यांच्या जमिनी घेण्याचा कायदा केला त्याला 'सेझ' असे नाव आहे. काय तर कच्चा मालावर प्रक्रिया करणारे उद्योग निर्माण झाले की, शेतकऱ्यांच्या



घरी सुबत्ता येईल, परंतु, त्याच्या सुपिक जमिनीच्या उरावर बसणाऱ्या कारखानदारांनी त्याला कशी पाताळात पाठवलं व भुमिहीन बनवलं जातय. यांचे प्रत्येकरी चित्र कैलास दौड लिहतात.

बळीचे वंशज आम्ही शेतकरी, चालतो पाताळी दृष्टीपुढे
वामनाचा आता, नाही पाय माथा, वामनाची गाथा संपेना
पहिल्या पायात आम्ही पायदळी, मग 'सेझ' तळी दिली भूमी

प्रत्यक्ष वामनरूपी शोषण व्यवस्था शेतकऱ्यांचा बळीच घेते सेझ कायदा म्हणजेच बळीला पाताळात धाडणारी गोष्ट विकासाच्या उजेडासाठी शेतकऱ्याला अंधारात पाठविण्याची तयारी या जागतिकीकरणाने केली आहे. अशा जाणिव जागतिकीकरणान्या अनुषंगाने आविष्कृत होते. भारत हा महासत्ता होणार हेही स्वप्न आम्हाला दाखविलं. पण कोणाच्या भरोसावर होणार हे सगळं ? यात, शेतकऱ्याला गृहीत धरलं. आणि जागतिकीकरणाच बेलगाम घोड चौखुर उधळलं. त्यामध्ये शेतकरी उध्वस्त झाला ही जाणिव पी. विठ्ठल यांच्या कवितेत आविष्कृत होताना दिसून येते. जागतिकीकरणाने शेती व शेतकऱ्यांच्या अस्तीत्वावरच प्रश्न उभे केले आहेत. हे भौतिक समृद्धिचे आभासमय चित्र आहे. शेतीचे फार्महाऊस झाल्याने, शेतकऱ्यांची वेदना बदलत नाही. प्रश्न शिल्लक राहतोच. शेतकऱ्यांच्या समस्या संपल्या असे नाही. शेतीविषयी आजच्या तरूणांना अनास्था वाटते. बाह्य जगाचा झगमगाट, इंटरनेटचे माथाजाल. हातातून न सुटणारा मोबाईल, त्यातील व्हाटसपअची दुनिया शेतकऱ्यांचा मुलांना शेतीमातीपासून तोडण्याचे काम करते आहे. आपण महासत्ता म्हणून जागापुढे येणार, असे खोटे-खोटे स्वप्न पाहणारी पिढी शेतीपासून फारकत घेते, या विषयी उपरोधकपणे पी. विठ्ठल आपल्या कवितेत लिहतात;

माणसाच्या भौतिक समृद्धिचा आलेख उंचावतोय,
शेतीचे फार्महाऊस होतायेत, गहू, ज्वारी,
हरबऱ्याऐवजी रोझगार्डनहोत आहेत.
शासनानं दिलेलं शिक्षण तळागळापर्यंत पोहचल
आमच्याही मूली रात्र रात्र जागून पाट्या करताहेत.
आता होत असतील एक दोन बलात्कार,
म्हणून, काय लगेच तुम्ही आम्हाला नावे ठेवावीत
एक मात्र खरं, आम्हाला महासत्ता बनायचंय
तुम्ही तुमचं ठरवा.

जागतिकीकरणाच्या परिवेशात निर्माण झालेली परिस्थिती वर्तमान जगण्याला जागतिकीकरणाने कशी बाधा झाली याच सामाजिक भान आणि जागतिकीकरणाची जाण मराठी ग्रामीण कवितेला वेगळेपणाची जाणिव आहे हे वैशिष्ट्याने नोंदवावे लागेल, तसे स्पष्टही होते.

सारांश :-

१९९० नंतर आलेल्या जागतिकीकरणाने ग्रामजिवनाला ग्रामसंस्कृतीतील विविधाअंगी प्रभावीत केले. परंपरागत कृषी जगण्याला परिवर्तनाची आशा लावून, विकासाची भ्रामक कल्पना रूजवली. शेठ सावकाऱ्यांच्या लुटीपेक्षा भांडवलशाहीने अवलंबलेली शेतकऱ्यांची महालुट थांबवता येईल का? खुल्या बाजाराची स्पर्धा फायद्याची असली तरी चंगळवादाच्या 'यज्ञात' कुणाची आहुती आपण देणार असा प्रश्न आज उपस्थित करणारे अनेक ग्रामिण कवि आहेत. काळ बदलतो, त्याची तत्वेही बदलतात त्या विषयीच्या जीवन जाणिवाही ग्रामीण कवितेत अधोरेखित होतात, आणि काळाची सोबत करणाऱ्या संवेदनशिल मनाच्या अस्वस्था जाणिवा व त्याचे संदर्भ जागतिकीकरणात लपलेले आहेत. काळानुरूप बदलाचे पडसाद कवि मनावर उमटतात, कविता जन्म घेते. तिथून व्यक्त होणाऱ्या व्यथा वेदना दैन्य, उपासमार, शोषण व नितीशून्यता, आधुनिकीकरणाचा खोटा



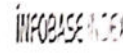
हव्यास, मातीशी खेळणाऱ्या इमानदार कास्तकाराला हमीभावासाठी आहुत्या द्यावा लागतात. शेतकऱ्यांचे शोषण करणारे कायदे रद्द करण्यासाठी दहा अकरा महिने आंदोलन करावे लागते. तरीही त्याचा आवाज ऐकून न एकल्याचे सोंग करणारी भांडवली व्यवस्था, शेतकरी, कष्टकरी माणसाच्या सुखासाठी, त्याच्या जगण्याला माणूसपण देण्यासाठी कधीच कृषीसंस्कृतीच्या बाजूने पाझरना नाही. म्हणूनच आजच्या ग्रामीण कवितेला जागतिकीकरणाच्या राक्षसाला कृषीसंस्कृतीचे भक्ष देऊ नये, असे पोट तिडकीने वाटते. परंतु काळ थांबवता येत नाही आणि वास्तवाकडे पाठ करून, पुढे चालताही येत नाही. अशी ग्रामीण जीवन जानिवांना प्रभावित करणारी जागतिकीकरणाची प्रभावशाली प्रक्रिया, कृषीसंस्कृतीला जानिवांच्या दृष्टीने प्रभावित करते. त्यांचे सर्वकष संदर्भ जागतिकीकरणात दडलेले व लपून आहेत. असे ग्रामीण कवितेतील जाणिवांच्या अनुषंगाने म्हणायला काय हरकत आहे.

निष्कर्ष :-

१. ग्रामीण कवितेवर जागतिकीकरणाचा प्रभाव आहे.
२. ग्रामीण कविता लिहणाऱ्या कविंची 'जाणिव' वास्तवाशी प्रामाणिक आहे. तीच्यात कालसंगत जीवनाचे संदर्भ आहेत.
३. जागतिकीकरणाच्या संदर्भाने ग्रामसंस्कृतीवर हे परिवर्तन लादले नसून, कालसंगत घडणारे बदल या कवितेने स्विकारले.
४. कृषीजगताचे प्रश्न ही कविता मांडते, बदलत्या काळासोबत चला असा आशावादी बोध देते.

संदर्भ ग्रंथ -

१. पळवेकर, अशोक, जागतिकीकरण आणि मराठी कविता, २०१० नवेगावकुस स्मरनिका, अमरावती
२. डॉ. सुरवाडे, मनोहर, ग्रामीण साहित्य स्वरूप आणि चिकित्सा, सुगावा प्रकाशन, अमरावती
३. कोत्तापल्ले, नागनाथ, ग्रामीण साहित्य स्वरूप व प्रेरणा
४. देशमुख, श्रीकांत, 'बळीवंत', शब्दालय प्रकाशन श्रीरामपुर, प्र.आ. २००६
५. कोळी, अशोक, कौतिक, 'गावा कडल्या कविता' साक्षात प्रकाशन, औरंगाबाद, प्र.आ. २००८
६. सुमंत, नारायण, 'सातबारा', श्री विद्या प्रकाशन, पुणे प्र. आ. २००४
७. पी. विठ्ठल, माझ्या वर्तमानाची नोंद, गोदा प्रकाशन, औरंगाबाद प्र. आ. २०११
८. भालेराव, इंद्रजित, 'टाहो', 'पिकपाणी' स्वरूप प्रकाशन, औरंगाबाद



प्रा.विक्रम उ.मोरे

सहायक प्राध्यापक
मराठी विभाग

गो.से.विज्ञान, कला आणि
वाणिज्य महाविद्यालय खामगांव
जि.बुलढाणा 444303, महाराष्ट्र

One Day International Interdisciplinary E-Conference On
BENEFITS OF LIFE VALUES IN CONTEMPORARY SOCIAL SYSTEM
On 30th September, 2021 @
K.M. MALKAPUR, D.M & P.H.S. P. COLLEGE, BALAPUR, & V. S. S., BRANCH AKOLA

संविधानातील मूल्यव्यवस्था आणि समकालीन समाजवास्तव

ABSTRACT

लोककल्याणाचा पुरस्कार करणारी 'बहुजनहिताय बहुजनसुखाय' या तत्वाने प्रेरित असलेल्या संविधान किंवा कायद्यापुढे सर्व भारतीय नागरिक समान आहेत, असे मानते. परंतु, भारतीय समाजातील विविधता वैशिष्टपूर्ण समाजजीवनाचे वास्तव, येथील समाजरचना, धर्मव्यवस्था, अर्थकारण, राजकारण इत्यादी मानवी समाजजीवनावर प्रभाव टाकणा-या घटकांनी भारतीय संविधानाने घालून दिलेली मूल्यव्यवस्था स्विकारली आहे का ? राबविली का ? यांचे उत्तर नकारात्मकच आहे. राजकारण, धर्मकारण, सांस्कृतिक जीवन, आर्थिक जीवन संविधानिक मूल्यव्यवस्थापाहिजे तेवढी व्यवहारात प्रभावित झालेले नाही. आजचे सामाजिक वास्तव निरक्षण करता नकाराची शक्यता आहे. पुढील काही मुद्द्यांच्या आधारे समकालीन समाजव्यवस्थेत संविधान मुल्यांची उपयोगिता स्पष्ट करण्याचा माझा प्रयत्न आहे.

उद्दिष्ट्ये :-

- 1- संविधानिक मूल्यव्यवस्थेची कालसंगत उपयोगिता शोधने
- 2- समकालीन समाजवास्तव उच्चतम जीवमूल्यांचा वर्तमानाच्या संदर्भाने विचार करणे

प्रस्तावना -

समकालीन भारतीय समाजजीवन व समाजव्यवस्थेचे संचालन संविधानाने स्थापित झालेल्या लोकशाही प्रणालीच्या नियंत्रणात आहे. लोकशाही ही केवळ राजकीय प्रणाली नसून सामाजिक सहजीवनाची प्रक्रिया आहे. ही प्रक्रिया राबवितांना भारतीय संविधानाने मान्य केलेली मूल्यव्यवस्था समकालीन समाजजीवनावर सुपरिणाम करणारी असावी, अर्थातच सामाजिक नीती विवेक आणि श्रेष्ठदर्जाचे नितीधैर्य असावे. तरच निकोप व निर्मळ जीवन जगता येईल सत्य, शिव, सुंदर हेच मानवी जीवनाचे उदात्त ध्येय राहिले आहे. ही आदर्श मूल्ये त्याचा अनुबंध संविधानिक मूल्याशी जोडता येतो का ? तर होय.

परंतु, प्रश्न आहे की, संविधानाने स्विकारलेली मूल्यव्यवस्था समकालीन समाजवास्तवात परिणामकारकपणे राबविली जाते का ? स्वातंत्र्य, समता, बंधुता, सामाजिक न्याय, धर्मनिरपेक्षता, वैज्ञानिकता इत्यादी तत्वे भारतीय समाजमानसिकतेने पूर्ण अर्थाने स्विकारली का ? समकालीन समाजवास्तवाचे निरक्षण व अवलोकन संविधानिक मूल्यव्यवस्थेने केले असता, भारतीय व्यवस्था निराश व निरस आणि

समाजजीवनाचा अपेक्षाभंगठरल्याचे चित्र अतीकडे दिसून येते आहे.

लोकशाही समाजजीवन शासनप्रणालीचा तिरस्कार मुलतत्ववादी व वर्चस्ववादी प्रवृत्तीने निर्माण केला आहे. येथील काही प्रतिगामी विचारधारेला संविधानिक मूल्यव्यवस्थाच मान्य नाही, तसेच पुरागामी विचार करणा-या चळवळी समकालात गोरून गेल्या आहेत. यामागील कारण मिमांस येथे प्रस्तुत नाही. संविधानातील उच्चतम जीवनमूल्ये आणि आजचे समाजवास्तव या बाबतचा अनुबंध समाकाळाच्या संदर्भात शोधण्याचा प्रस्तुत शोध निबंधात प्रयत्न करण्यात आला आहे. सामाजिक, धार्मिक, सांस्कृतिक, क्षेत्राच्या मर्यादेत संविधानाने निर्माण केलेली मूल्यव्यवस्था आणि आजचे समाजवास्तव कसे आहे. या बाबत प्रस्तुत शोधनिबंधात मर्यादा घालून घेतली आहे. समग्र भारतीयांच्या जीवनाला प्रभावित व सुस्थित प्रगतीची वाट दाखविणारा, समाजसहजीवनाची प्रेरणा देणारा, शोषणाविरुद्ध हक्क देणारा व मूलभूत हक्काचे संरक्षण करणारा आणि भारतीय नागरिकांना आपल्या कर्तव्याबाबत दिशादर्शविणारा एक महत्त्वाचा राष्ट्रग्रंथ म्हणून संविधानाला अत्यंत महत्त्व आहे. तसेच त्याकडे पाहिले जावे.

लोककल्याणाचा पुरस्कार करणारी 'बहुजनहिताय बहुजनसुखाय' या तत्वाने प्रेरित असलेल्या संविधान किंवा कायद्यापुढे सर्व भारतीय नागरिक समान आहेत, असे मानते. परंतु, भारतीय समाजातील विविधता वैशिष्टपूर्ण समाजजीवनाचे वास्तव, येथील समाजरचना, धर्मव्यवस्था, अर्थकारण,

राजकारण इत्यादी मानवी समाजजीवनावर प्रभाव टाकणा-या घटकांनी भारतीय संविधानाने घालून दिलेली मूल्यव्यवस्था स्विकारली आहे का ? राबविली का ? यांचे उत्तर नकारात्मकच आहे. राजकारण, धर्मकारण, सांस्कृतिक जीवन, आर्थिक जीवन संविधानिक मूल्यव्यवस्थापाहिजे तेवढी व्यवहारात प्रभावित झालेले नाही. आजचे सामाजिक वास्तव निरक्षण करता नकाराची शक्यता आहे. पुढील काही मुद्द्यांच्या आधारे समकालीन समाजव्यवस्थेत संविधान मुल्यांची उपयोगिता स्पष्ट करण्याचा माझा प्रयत्न आहे.

जातीयवास्तव आणि मुल्यसंवर्धन :-

भारताची जातीव्यवस्था आणि भारतीय संविधान मूल्यव्यवस्था पुर्णतः भिन्न आहे. भारतीय संविधानाने समतेचे मूल्य स्विकारले आहे आणि जातीय व्यवस्था विषमतः आधारीत आहे. येथील जातीप्रथा मानवी जीवनावर प्रभाव टाकणारी दुष्ट निती आहे. आजही व्यवहारातून जात नष्ट झाली नाही. माणसात भेद करणारी ही अनैसर्गिक व्यवस्था असून मानवी मुल्ये नाकारते. जातीय श्रेष्ठत्वाचा अहंकार जपणा-या उच्च वर्णीय जाती दलीतांना आजही तुच्छ समजतात. जाती-जातीतही तुच्छता भाव आहे. युपी, बिहारमध्ये आजही दलितांना नीच दर्जाची वागणूक दिली जाते. उच्च वर्णीय जाती गट तिरस्कार मानसिकतेने त्यांच्याशी व्यवहार करतात भारतीय संविधानाने जात व्यवस्था नष्ट केली आहे परंतु व्यवहारात तिचे अस्तित्व आजही कायम आहे हे भारतीय समाज व्यवस्थेचे दुर्भाग्य आहे. शाळा महाविद्यालयाच्या दाखल्यावर जातीची नोंद करून लोकशाही मध्ये जातीचे पुर्णजीवनहोत आहे. मानवतेच्या विरोधात असून मानुसकीचे अवमूल्यन करणारे आहे. भारतीय संविधानाने राज्य धोरणाची निर्देशक तत्वे सांगतात अनुच्छेद-46 मध्ये म्हटले आहे की, अनुसुचित जाती, अनुसुचित जनजाती, दुर्बल घटक, यांच्या शैक्षणिक, आर्थिक, धार्मिक जीवनाचे विशेष संवर्धन संविधान करेल. त्यांची विशेष काळजी घेतली जाईल सामाजिक स्तरावरील सर्व प्रकारचा भेदभाव आणि शोषण यापासून त्यांचे संरक्षण करील. असे नमुद असतांना आजही जातीय द्वेषातून दंगलीच्या घटना संविधान लागू होउन 71 वर्षे झाले तरीही घडत आहे.

धर्माधशक्तीचा वर्चस्ववादी दृष्टिकोनात फारसा फरक पडलेला नाही. हे अनेक घटकांच्या आधारे स्पष्ट होते. जम्मु जिल्ह्यातील कठुआ गावात एका आठ वर्षीय मुलीवर ती खालच्या जातीची असल्यामुळे तिने देवळात प्रवेश केल्यावर गावातील आठ नराधर पुरुषांनी देउळ बाटविले म्हणून तिच्यावर बलात्कार केला. आणि त्या चिमुकलीला मारूनही टाकले त्यांची तक्रार पोलिसांतही घेतली गेली नाही कारण .पोलीसातील

अधिकारी हे उच्चवर्गीय होते. उलट अन्यायग्रस्त कुटुंबाच्या विरोधात मोर्चे काढले गेले. या घटनेतील नराधमांची चौकशीही करण्यात आली नाही. तर त्या दलीत कुटुंबाला न्याय मिळणे तर दुरच आज दलितांची आर्थिक स्थिती सुधारली तरीही, त्यांच्याशी जातीय द्वेषाची दुर्भावणा कायम ठेवली जाते. कारण जात ही 'मानसिक विकृती' असून दुर्भावना मुलक जाणीव आहे. ही मानसिकता बदलणे काळाची गरज आहे. खैरलांजीतील भोतमांगे परिवाराची नियोजित घडून आणलेली हत्या प्रकरण, उत्तरप्रदेशातील उण्णाव येथे दलित मुलीवर झालेला बलात्कार, खामगांव तालुक्यातील चितोडा अंबिकापूर येथील दलित तरुणाचा रचनात आलेला हत्येचा कट या सर्व वादी दलितांच्या विषयी द्वेष भावना असल्यामुळेच घडत आहे. महाराष्ट्रात मराठा मार्चांनी अॅट्रोसिटी कायदा रद्द करावा म्हणून केलेली मागणी जाती वर्चस्वाच्या दृष्टिकोनातून आहे. दलितांचे संरक्षण करणारा अॅट्रोसिटी अॅक्ट रद्द झाल्यास दलितांवर अन्याय होत राहतील. हा कायदा रद्द करणे म्हणजे चोराने चोरी करावी आणि त्यानेच मागणी करावी की चोरीची शिक्षा असलेला कायद्याची तरतूद रद्द करा. एखाद्या बलात्काराने एखाद्या स्त्रीवर बलात्कार करावा आणि त्यानेच म्हणावे की स्त्रियाच पुरुषांना फसवितात म्हणून हा कायदा पुरुषविरोधी आहे तो रद्द करवा हे कितपत बरोबर वाटते. प्रत्येक कायद्याचा वापर आणि गैरवापर होतच असतो त्यामुळे कायदा रद्द करणे गरजेचे नसते. उलट कायदा प्रभावी पणे राबविणारी यंत्रणा किती ंसक्षमतेने व विवेकाने काम करते का हे महत्त्वच आहे असते. रोहित वेमुला नावाच्या एका दलीत विद्यार्थ्याने उच्च वर्णीय प्राध्यापकांनी त्रास दिल्याने आत्महत्या केल्याचे उदाहरण आहे. आपल्या हक्क आणि अधिकारासाठी जेव्हा दलित व्यवस्थेशी भांडतात तेव्हा त्यांनाच जातीवादी ठरविले जाते. अशा प्रकारे जातीची श्रेष्ठत्वत आजही बेमालून पणे काम करते. भारताचे राष्ट्रपती म्हणून के.आर.नारायण यांची जेव्हा निवड झाली तेव्हा भारतातील न्यूज चॅनेल व वर्तमानपत्रांनी ते पहिले भारतीय दलित राष्ट्रपती म्हणून पुढे आले आहे. अशा बातम्या छापल्या राष्ट्रपतींना दलित म्हणजे कितपत योग्य आहे. येथेच जातीश्रेष्ठत्वांचा सिध्दांत काम करतो. म्हणून भारतीय संविधानमूल्य समकालीन समाजवास्तव समजून घेउन अपेक्षित उपयोगिता आव्हानात्मक पध्दतीने पुढे न्यावी लागेल. धर्मनिरपेक्षता व जीवनमूल्य :-धर्मव्यवस्था ही मानवाने स्वतःच्या जगण्याच्या विशिष्ट पध्दतीला धारण करण्याची पध्दती म्हणून जन्मास घातली आहे. धर्मव्यवस्था ही मानवनिर्मित असून सामुहिक जीवनाचे नितीतत्व त्यामध्ये सांगितले आहे. दया, क्षमा, शांती, प्रेम, अहिंसा ही मानवी मूल्य

धर्मांनी प्रस्तुत केली आहे त्याआधारावर जीवन जगल्यास मानणासे जीवन सुखी होते. परंतु, समकालीन चारत्तव जीवनाकडे पाहिले असता. या मुल्यांची मोडतोड होतांना दिसते भारतीय संविधानाने स्विकारलेली धर्मनिरपेक्षता येथील बहुधर्मीय समाजव्यवस्थेला निश्चितच दिशादर्शक व फायद्याची आहे. परंतु, अलीकडे 'हिंदु खतरे' मे हे आणि हिंदु राष्ट्राची करण्यात येणारी मागणी धर्म निरपेक्षतेच्या तत्वाला हरताळ फासते. 'ना मुसलमान खतरे मे हे, ना हिंदु खतरे मे हे खतरे मे तो मानवताही हे' कोणत्याही धर्माची अरेरावी खपवून घेतली जाऊ नये. यासाठी संविधानाने धर्मनिरपेक्षता हे सर्वोत्तम मुल्य भारतीय समाजाला दिले आहे. आजही ख्रिश्चन, मुस्लिम यांचा द्वेष केला जातो. हा एक प्रकारचा सांस्कृतिक दहशतवाद आहे. समाजाची स्थिर झालेली घडी विस्कटून टाकणा-या धर्माध शक्ती अलीकडे जोर धरू लागले आहे. सन 2017 मध्ये दिल्ली जवळच्या एका खेड्यात जुनैद नावाच्या एका मुस्लिम तरुणाची धावत्या ट्रेनमध्येच हत्या करण्यात आली होती. दुस-या दिवशी ईद असल्यामुळे ईदीसाठीची खरेदी करून तो गावी परत जात होता. तेव्हा त्याच्या थैलीमध्ये गोमास आहे अशी अफवा करण्यात आली. त्यांच्या डोक्यावर ईस्लामी टोपी असल्यामुळे त्यालाच जमावाने पकडले. आणि ठार केले. तेव्हा त्या ट्रेनच्या डब्यामध्ये जवळपास 200 प्रवासी प्रवास करीत होते. परंतु, एकाही सुज प्रवाशाने अटकाव केला नाही. उत्तर प्रदेशातील दादरी या गावात मोहम्मद अखलाद नावाचा एक मुस्लिम युवकाने आपल्या घरामध्ये गोमास ठेवल्याच्या कारणावरून उच्चवर्णीय त्याला घरात कोंडून मारून टाकले म्हणजे गाय या पशुचे महत्त्व धार्मिक दृष्टिकोनातून असेलही परंतु, मुस्लिम हा सुध्दा प्राणूस आहे हे तत्वच ते लोक विसरले. हे दैर्घ्य म्हणावे लागेल. येथील न्यायव्यवस्था ही उच्च वर्णियांची मक्तेदारी बनली आहे. तिच्यावर त्यांचाच प्रभाव आहे. डिसेंबर 2017 मध्ये दिल्ली येथे ऑल इंडिया डेमोक्रेटिक मेन्य असोसिएशन भरली तेव्हा मोहम्मद अखलाक याची मुलगी शाईस्तालापरिषदेतील लोकांनी विचारल्यावर तिने सांगितले की, माझ्या वडीलांना ज्यांनी धार्मिक द्वेषातून ठार मारले त्यांना चांगल्या नोक-याही भेटल्या आहेत. आम्हांला मात्र गाव व शिक्षणही सोडावे लागले. आमच्या बाजूने न्याय केला गेला नाही. कारण न्याय देणारे हे उच्च वर्णीय होते. अर्थातच न्याय व्यवस्थाही धर्मानंद लोकांच्या हातात आहे. मग, धर्मनिरपेक्षता हे संविधानिक मुल्य राबविले कसे जाईल. बहुधर्मीय असलेल्या या राष्ट्रामध्ये धर्मनिरपेक्षता या तत्वानेच आपण सुस्थिर राहू शकतो धर्माधर्मात अभिव्यक्तीस्वातंत्र्य यात मुळीच शंका नाही. अभिव्यक्ती स्वातंत्र्य आणि आजची समाजवास्तविकता :-

घटनेच्या कलम 19 नुसार भारतीय नागरिकांना संविधानाने अभिव्यक्तीचा अधिकार दिला आहे. विचार, धर्मप्रसारण प्रचार करणे, हे 'अभिव्यक्ती स्वातंत्र्य' आहे. या संविधानिक मुल्याचा विचार केला असता मानवी विकासाला साहाय्यभूत ठरविणारे ते मुल्यगामी तत्व आहे. माणसाच्या प्रगतीमध्ये या तत्वाचा मोलाचा वाटा आहे. लेखक, कवी, पत्रकार, कलाकार, विचारवंत व कोणताही सर्जनशील व्यक्ती याला अभिव्यक्तीची गरज असते. हे घटनेने मान्य केले आहे. लोकशाहीवर निष्ठा ठेउन अभिव्यक्ती स्वातंत्र्य उपभोगल्यास प्रगतीस साधता येते. परंतु, वर्तमान वास्तव दुर्दैवाने उलट घडत आहे. 20 ऑगस्ट 2013 रोजी महाराष्ट्रामध्ये अंधश्रद्धा निर्मूलन समितीचे अध्यक्ष डॉ. नरेंद्र दाभोळकर यांची हत्या झाली. 16 फेब्रुवारी 2015 रोजी कॉमरेड गोविंद पानसरे यांचा खून झाला. 30 ऑगस्ट 2015 रोजी कर्नाटकच्या वेळगांवमध्ये प्राध्यापक कलवुर्गी यांची राहत्या घरात गोळ्या झाडून हत्या करण्यात आली. पत्रकार गौरी लंकेश यांनाही मारण्यात आले. ही सर्व मंडळी समाजाला मानवतावादी विचार देण्याचे काम करीत होते. ते प्रखर बुद्धिवादी व विवेकाने आपले विचार मांडत असतात. या विचारवंतांचे विचार येथील मुलतत्ववादी सनातन प्रवृत्तीच्या काही लोकांना आवडले नसतील. परंतु, ते देवधर्माबद्दल कधीही बोलत नव्हते समाजातल्या अनिष्ट रूढी प्रथा, परंपरा, अविज्ञान, जादूटोना, भूतबाधा, बुआबाजी, याबद्दलच विचार मांडत होते. त्यांच्याशी प्रतिवाद न करता त्यांना जीवनातून संपवून टाकणे म्हणजे अभिव्यक्ती स्वातंत्र्याची गळचपी करण्यासारखी आहे. एखाद्याची विचार आपणांस पटत नसतील तर, ते घ्यायचे किंवा न घ्यायचे हे सर्वस्वी आपल्यावर अवलंबून आहे. परंतु, हे सार्धे तत्व लक्षात न घेता एकदमच विवेकवादी लोकांच्या जीवावर उठणे त्यांची हत्या घडविणे हे अभिव्यक्ती स्वातंत्र्याची पायमल्ली आहे. आजचे वर्तमान वास्तव समजून घ्यावे.

वैज्ञानिक दृष्टिकोन आणि आजचे वर्तमान :-

विज्ञानामुळे मानवाने मोठी प्रगती साधली विज्ञान हा मानवी जीवनाचाच एक भाग आहे. या अर्थाने ते मुल्य आहे. उन्नत व जागृत समाजाचे लक्षण म्हणून त्याकडे पाहता येईल. अखिल मानव जातीच्या विकासासाठी वैज्ञानिक दृष्टिकोन जनमानसात रुजला पाहिजे. विनोबा भावे याबाबत म्हणतात की, 'येत्या काळात धर्म आणि राजकारण जाईल विज्ञान व अध्यात्मच राहिल' परंतु, वर्तमान सामाजिक वास्तवाचे अवलोकन केले असता शिकली, सवरलेली माणसेही अंधश्रद्धा पाळतात आणि या विज्ञान तत्वाला हरताळ भासतात. कोणताही कार्यकारण भाव लक्षात न घेता आमचे भारतीय लोक देवा

कडून अपेक्षा करतात की देवा,बाप्पा महागाई करी कर स्त्रीयांवर होणारे अन्याय करी कर, कोरोनाचे संकट दूर कर, देवा पाउस पडू दे, यामागे अज्ञानच आहे विज्ञान नाही. भरपूर पसाणात पाउस पडाचचा असेल तर, झाडे लावावे लागतात. ते न करता देव आणि दैवावर विसंबून राहणे म्हणजे विज्ञानाकडे तोड फिरवणे आहे. महाविद्यालयात विज्ञान शिकविणारा एखादा पाठ्यापक जेव्हा नवी कार घेतो तेव्हा आपल्या कारच्या नटघरला तो तिंबू, मिर्ची व काळा धागा बांधतो. सामान्य माणसाने असे केल्यास ते आपण समजू शकतो. परंतु, शिकलेली माणसं जेव्हा अंधश्रद्धेचे पालन करतात तेव्हा वैज्ञानिक मुल्य न स्विकारल्याचे हे लक्षण आहे. त्याची व्यवहारिकता आम्ही सिध्द करू शकतो नाही. देव, धर्म, नशील याभोवती गुरफटलेला माणूस विज्ञानाचे बोट धरून जेव्हा चालेल तेव्हा वैज्ञानिक मुल्य जनमाणसात रुजेल यात शंका नाही.

गोषवारा :-

आपल्या देशाने स्विकारलेली आधुनिक मुल्यव्यवस्था संविधान आधारीत आहे. स्वातंत्र्य, समता, न्याय, बंधुता, धर्मनिरपेक्षता व वैज्ञानिक दृष्टिकोन हे आधुनिक भारतीय समाज व्यवस्थेमध्ये रुजलेली संविधानिक मुल्ये आहे. समकालीन, समाजजीवन या तत्वाने प्रभावित व्हायला पाहिजे हाच संविधानाचा मुल मंत्र आहे. शाळा कॉलेजमधून संविधानाचा अभ्यास व्हायला पाहिजे तरच संविधानाने निर्माण केलेली मुल्यव्यवस्था लोकांच्या लक्षात येईल. संविधान केवळ कायद्याचे पुस्तक नाही. तर माणसाच्या विकासाचा तो केंद्र बिंदू आहे. संविधानाची उद्देशपत्रिका व मार्गदर्शक तत्वे यांचे निरीक्षण केले असता नैतिक मुल्यांचा आधारावरच नव समाजाची उभारण करता येते. हा संविधानाचा संकल्प आहे. परंतु, संविधान राबविणा-याच्या हाती संविधानाच्या मुल्य व्यवस्थेच्या यश-अपयशाची जबाबदारी आहे. जगातील सर्वात आदर्श संविधान म्हणून जग भारताकडे पाहते. कारण, मानवी जीवन मुल्यांना प्रत्यक्ष उपयोगितेच्या मुल्यांच्या आधारावर त्याचे श्रेष्ठत्व सिध्द करता येते. भारतीयांचे उन्नत आणि उदात्त आणि प्रगतीशिल जीवन संविधानाच्या बळावरच सुस्थिर व प्रगत होउ शकते. हे राज्य कर्त्यांनी समजून घ्यायला पाहिजे. 'बहुजन हिताय बहुजन सुखाय' हाच संविधानाचा मुल मंत्र आहे. संविधानाच्या यश-अपयशाची जबाबदारी हे संविधान राबविणा-यावर येउन पडते. संविधान सभेपुढे भाषण करतांना डॉ.आंबेडकर यांचे वक्तव्य येथे मला प्रस्तुत वाटते ते म्हणाले होते की, 'संविधान कितीही चांगले असो. ती राबविण्याची जबाबदारी ज्यांच्यावर आहे ते जर अप्रमाणिक असतील तर ते वाईट

ठरल्याशिवाय राहणार नाही. तसेच, संविधान कितीही वाईट असो तरी, ते राबविण्याची जबाबदारी ज्यांच्यावर आहे ते प्रामाणिक असतील तर ते चांगले असल्याशिवाय राहणार नाही'. आज डॉ.बाबासाहेब आंबेडकर यांच्या विचाराची प्रचिती येत आहे. घटनेप्रमाणे वागण्याची निती भारतीय समाजजीवनात रुजल्याशिवाय मानवी जीवन मुल्यांची धारणा भारतीय समाजात पक्की होणार नाही. सत्य, अहिंसा, सहिष्णुता, समता, न्याय, धर्मनिरपेक्षता व वैज्ञानिक दृष्टिकोन हे संविधानिक मुल्य समाजाच्या जीवन व्यवहाराचा भाग झाला पाहिजे तरच, वर्तमान समाजामध्ये संविधानिक मुल्यांची परिणाम कारकता स्पष्ट होईल. दासळलेली मुल्य व्यवस्था संविधानिक मुल्यांच्या आधारेने दुरुस्त करता येईल. त्या दिशेने आपण विचार करूया आणि संविधानिक मुल्यांची जपवणूक करूया.

संदर्भ :-

- 1- भा.ल.भोळे, धर्म, समाज आणि राजकारण, पृ.94,
- 2- राम पुनिया, धर्मवाद-जमातवादाच राजकारण, पृ.34
- 3- डॉ.अशोक चौसाळकर संपा, धर्म, समाज आणि राजकारण पृ.74
- 4- जनार्दन वाघमारे, उदारमतवाद संसदीय लोकशाही आणि संविधान, विचारशलका, जाने-मार्च 1992, लातूर
- 5- फा.फ्रान्सिस दिब्रिटो, अभिव्यक्ती स्वातंत्र्याचा प्रश्न, लेख, अक्षरगाथा जानेवारी 2016

ISSN - 2279 - 0489
AN INTERNATIONAL MULTIDISCIPLINARY
HALF YEARLY RESEARCH JOURNAL

GENIUS

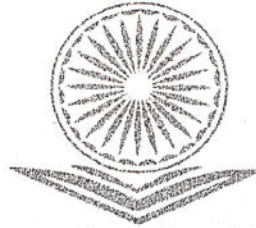
Volume - X

Issue - II

February - July - 2022

English / Marathi

Peer Reviewed Refereed and
UGC Listed Journal No. 47100



ज्ञान-विज्ञान विमुक्तये

IMPACT FACTOR / INDEXING

2020 - 6.538

www.sjifactor.com

❖ **EDITOR** ❖

Asst. Prof. Vinay Shankarrao Hatole

M.Sc (Maths), M.B.A. (Mktg.), M.B.A. (H.R.),
M.Drama (Acting), M.Drama (Prod. & Dir.), M.Ed.

❖ **PUBLISHED BY** ❖

Ajanta Prakashan

Aurangabad. (M.S.)





CONTENTS OF MARATHI



अ.क्र.	लेख आणि लेखकाचे नाव	पृष्ठ क्र.
१३	स्वातंत्र्योत्तर काळातील ग्रामीण विकासाच्या योजना डॉ. पुरुषोत्तम रा. भांडे	६२-६६
१४	भारतीय एकता, अखंडता, समस्या व उपाय प्रा. डॉ. भाऊराव रामेश्वर तनपुरे	६७-७१
१५	स्वतंत्र भारताच्या वाटचालीची ७५ वर्षे व छत्रपती शाहू महाराज यांचे आरक्षण धोरणातील योगदान डॉ. सुभाष गवई महादेव उकडा सातव	७२-७५
१६	भारतातील अजून स्त्री व्यक्ती का नाही प्रा. डॉ. गजानन रा. लोहवे	७६-८०
१७	आदिवासी चळवळ आणि स्त्रिया डॉ. शंकर मारोती सावंत	८१-८५
१८	इ.स. २००० नंतरची समस्याप्रधान कादंबरी 'पाडा' प्रा. विक्रम उखडा मोरे	८६-९३
१९	एकनाथी भागवतातील भौतिक पर्यावरण विचार प्रा. डॉ. ज्ञानेश्वर महादेवराव गाडे	९४-९७
२०	डॉ. बाबासाहेब आंबेडकरांचे लोकशाही विषयक विचार डॉ. प्रदीप मोहन कांबळे	९८-१०३
२१	नवभारताचे शिल्पकार : पंडित जवाहरलाला नेहरू प्रा. डॉ. पी. आर. जुनघरे	१०४-१०८
२२	नवीन शैक्षणिक धोरणावर जागतिकीकरणाचा प्रभाव डॉ. अतुल नारायण खोटे	१०९-११३
२३	“बुर्गाट” एकविसाव्या शतकातील स्त्री समस्या प्रधान कादंबरीचे स्वरूप प्रा. सिद्धार्थ कुंडलिक इंगोले	११४-११७
२४	भारतीय संविधान व लोकशाहीची वाटचाल प्रा. सौ. सुषमा सु. जाजु	११८-१२१

१८. इ.स. २००० नंतरची समस्याप्रधान कादंबरी 'पाडा'

प्रा. विक्रम उखर्डा गोंरे

सहायक प्राध्यापक, मराठी विभाग, गो.से विज्ञान, कला व वाणिज्य महाविद्यालय, खामगांव, जि. बुलढाणा.

प्रस्तावना

समस्याप्रधान कादंबरी संकल्पना सर्वप्रथम डॉ. भालचंद्र नेमाडे यांनी मांडली. मराठी कादंबरी प्रेरणा व स्वरूप या निबंधामध्ये (1980) त्यांनी समस्याप्रधान कादंबऱ्याचा एक गट तयार करून सामाजिक समस्येचे सर्जनात्मक स्वरूप निर्देशित करणारी साहित्यकृती समस्याप्रधान म्हणून ओळखली जावी असे नमूद केलेले आहे. 1854 साली बाबा पद्मजी लिखित 'यमूनापर्यटन' ह्या कादंबरीत विधवांचा प्रश्न मांडला आहे.

समाजजीवनात विधवांना कोणकोणत्या समस्यांना सामना करावा लागतो, समाजाचा त्यांच्याकडे पाहण्याचा दृष्टिकोण, याबाबतच्या समस्येच्या अनुषंगाने यमूनेची कहाणी चित्रित झालेली आहे. या साहित्यकृतीला मराठीतील पहिली 'समस्याप्रधान कादंबरी' मानले जाते. तसे विचार, करता प्रत्येक कादंबरीत कोणती ना कोणती समस्या चित्रित असते. रजनप्रधान, रीतीवादी, ऐतिहासिक अशा कादंबऱ्याही समस्यांचे मांडण्याचा प्रयत्न करतात, मानवी जीवन नानाविध समस्यांनी घेरलेले आहे. सामाजिक, आर्थिक, राजकीय, धार्मिक, पर्यावरणीय, सांस्कृतिक या अनुरोधाने कमी-अधिक स्वरूपात समस्यांचे जेव्हा बहुसंख्य लोकांचे सामुहिक जीवन प्रभावित करते, त्याच्या परिणामाची जाणिव वास्तव जगण्याला छळत असते, तेव्हा एखादा सर्जनशील लेखक, त्या समस्येच्या मुळांशी कारणात्मक दृष्टीने व सर्जनात्मक अनुभूतीने भिडतो.

त्याविषयी चिंतनाशिलमनाने विचार करतो, त्या समस्येच्या विविधांगी बाजू समजून घेतांना अस्वस्थ होतो, त्याच्या सर्जनशील मनाने त्या प्रश्नांची उकल करावी. चर्चा केली जावी, भूमिका घेतली जावी अशा जाणिवेने एखादा लेखक प्रेरित होतो. त्या प्रश्नांच्या, समस्येच्या अनुषंगाने त्याच्या अनुभव, जाणिवेचे अभिव्यक्त करतो त्या अभिव्यक्तीचे मांडणीचे रूप कथा, कादंबरी नाटक यांचा रचनाबंध तयार करतो. समस्येचा केंद्रकाभोवतीचा विषय, आशय, पात्ररचना, घटना, प्रसंग, भाषा, वातावरण निर्मिती या घटकांचा विचार प्रामुख्याने एखाद्या समस्येची मांडणी करण्यासाठी जेव्हा प्रभावीपणे, कलात्मकभान राखून व समस्या हेच प्रेरणाद्रव्य मानून लिहिली गेलेली साहित्यकृती, समस्याप्रधान म्हटली जाते.

प्रस्तुत शोध निबंधामध्ये प्रामुख्याने समस्याप्रधान कादंबरी म्हणून, 'पाडा' या कादंबरीचा विचार करता येईल, असे मला वाटते. १९९० नंतर आपल्या देशात 'खाऊजा' धोरण अंमलात आणले गेले. जागतिकीकरणाचा प्रभाव सर्वच क्षेत्रावर पडू लागला, त्यामुळे भारतीय अर्थव्यवस्थेवर काही सुपरिणाम

सोडल्यास भारतीय कृषीजगतावर याचे दुरगामी परिणाम झालेला आहे. मुठभर भाडवंलदार व फार्महाऊसवाल्या शेतकऱ्यांसाठी कदाचित जागतिकीकरण फायद्याचेही ठरले असेल, परंतु; बहुसंख्य शेतकरी समाजावर भाडवली अर्थव्यवस्थेत दुरगामी परिणाम झाले. त्यामुळे अनेक समस्या निर्माण झाल्या. अनेक प्रश्न तयार झाले. प्रस्तुत शोध निबंधामध्ये जागतिकीकरणाच्या नंतर अर्थात त्याला 'नवोदत्तरी साहित्य जाणिवा' म्हटले जाते. त्या अनुषंगाने समस्याप्रधान कादंबरी म्हणून 'पाडा' या कादंबरीचे स्वरूप वैशिष्ट्ये, समस्येचे केंद्रक, आशय, अभिव्यक्ती पात्ररचन, भाषा या बाबतीत केळी उत्पादन शेतमालाला भाव न मिळण्याच्या समस्येभोवती कथानक आहे. त्या समस्येचा विविध बाबींवर विचार करणारे, कथानक आणि रचनाबंध याचा विचार लेखक करतो. जाणीवपूर्वक एखादी भूमिका या विषयीचे चिंतन कलात्मक पातळीवर मांडणी करून साहित्यकृती जन्मास घालतो. यादृष्टीने, समस्याप्रधान कादंबरी म्हणून 'पाडा' ह्या अशोक कौतिक कोळी लिखित कादंबरीत कोणती तत्वे प्रस्तुत झालेली आहेत, हा विचार करण्याची मर्यादा प्रस्तुत शोधनिबंधाला आहे.

समस्याप्रधान कादंबरीची रुपरेखा

नवोदत्तरी साहित्यातील नविन जाणिवाचा प्रस्तुत शोध निबंधात समस्या प्रधानतेच्या अनुषंगाने विचार केला असता, नव्या आर्थिक धोरणाचे प्रभावित झालेले कृषिजीवन, त्यात निर्माण झालेल्या समस्या व प्रश्न याच चित्रण करणाऱ्या अनेक कादंबऱ्या व लेखन करणारे मराठी लेखक मराठी साहित्य प्रवाहात आढळून येतात. झाडाझडती, मेड इन इंडिया, सेझ. तहान या सारख्या कादंबऱ्यांनी समस्याप्रधानतेचे तत्व मांडल्याचे दिसून येते. विश्वास पाटील, शंकर सखाराम, सदानंद देशमुख, यांच्या लेखनात कुठल्यातरी समस्येचा सर्वांगीण विचार केल्याचे आढळते. समस्येच्या केंद्रकाभोवती फिरणार कथानक किंवा कादंबऱ्याच्या रचनाबंधाचे सर्व घटक एखाद्या समस्येचा अनुरोधाने, कलात्मक अनुभव चित्रित केल्याचे दिसते. पाणीटंचाई प्रश्न असेल, विस्थापित धरणग्रस्तांचा प्रश्न, शेतमालाचा योग्य दर न मिळण्याची समस्या, लोडशेडींग प्रश्न, सेझ कायदा व शेतकरीचे प्रश्न. त्याचे विविधांगी समस्या दर्शन उपरोक्त साहित्यकृतीत आहे.

समस्येच्या अनुरोधाने प्रस्तुत काही लेखाकांनी कादंबरीचे लेखन केल्याचे आढळते. जीवनाच्या विविध क्षेत्रात राजकारण, धर्मकारण, अर्थकारण, संस्कृती, पर्यावरण इत्यादींचा समावेश होतो. २१व्या शतकातील शेतकऱ्यांचे प्रश्न, तसेच अर्थव्यवस्थेतील धोरणामुळे काही प्रश्न उद्भवलेले आहेत. तसेच मराठी साहित्यात धर्मव्यवस्थेने निर्माण केल्याला रूढी म्हणून पाळलेला समस्याचा विचार नव्याने करण्यासाठी दिशादर्शक अशी अनुभूती देणारी राजन गवस यांची तणकट, भांडारभोग या कादंबऱ्या धर्माच्या नावाखाली, देवदासी प्रथेने निर्माण केलेला समस्याचा मुलगामी वेध घेतात, विचार करतात. ह्या प्रथा धर्माच्या नावाखाली सुरू आहेत, परंतु ; त्याने मानवीजीवनात अनेक समस्या उद्भवल्या याचे चित्रण त्यामध्ये येते. अलिकडच्या काळात समाज जीवनातील नानाविविध घटकांना नव्याने भेडसावणाऱ्या किंवा नवाने निर्माण

झालेले प्रश्न , समस्येचे रूप धारण करतात. त्याबाबत चिंतन, त्या समस्याच्या विविध बाजू समजून घेवून समकाळातील नव्या प्रश्नाबाबतच्या जाणिवा कादंबरीतून व्यक्त झाल्याचे दिसून येते . जशे की,, संतोष जगताप यांची , 'विजेने चोरलेले दिवस' ही कादंबरीत विजेच्या लोडशेडीगची समस्या व तिचे दुरगामी परिणाम. त्या अभावी शेताला पाणी देण्याचा प्रश्न व त्यातून निर्माण झालेल्या समस्या याबाबत ग्रामीण वास्तव जीवन चित्रित झालेली आहे.

'छावणी' नामदेव माळी यांची कादंबरी ही दुष्काळी समस्येचे चित्रण करते. उत्तम कांबळे याची कादंबरी उस तोडकामगारांची समस्या मांडणारी कादंबरी. निशाणी डावा अंगठा, ही रमेश इंगळे उतरादकर यांच्या कादंबरीत ग्रामीण शिक्षण व्यवस्थेतील समस्या चित्रित करण्यात आले आहे. 'तहान' ही सदानंद देशमुख यांची तिवपाणीटचाईचे चित्रण करणारी कादंबरी.

'चाळेगत' ही प्रविण बांदेकर यांची मत्सव्यवसाय करणाऱ्या मत्सीमार लोकांच्या समस्येची चित्रण करणी कादंबरी, अशा काही 21 व्या शतकातील सन २००० नंतरचे समाज जीवनातील , विशेष करून कृषी समस्यांची उल्लेखनीय कलात्मक पातळीवर मांडणी केलेली आहे. -- या कादंबऱ्याला 'समस्याप्रधान' का म्हटले जाते ? . कारण या साहित्यत समस्येला प्राधान्य दिले असल्यामुळे. अशा कादंबऱ्यांना समस्याप्रधान कादंबरी अशी मान्यता द्यायला हरकत असू नये.

कारण या उल्लेखलेल्या कादंबऱ्यामध्ये एखाद्या समस्ये बाबतचे कलात्मक भान अधोरोखित झाल्याचे आढळते, म्हणून मला या कादंबऱ्याला 'समस्याप्रधान 'कादंबऱ्या म्हणायचे आहे. आपणापुढे प्रश्न उभा राहतो की 'समस्याप्रधान कादंबरी' कशाला म्हटले पाहिजे.

कशाला हे नवे प्रचलन, जशे इतिहासिक नाटक, राजकीयदृष्ट्या विषय मांडणी कादंबरी राजकीय कादंबरी. पौराणिक विषय असलेली पौराणिक कादंबरी, मनोविश्लेषणात्मक कादंबरी, आदिबंधात्मक कादंबरी असे वैशिष्ट्यपूर्ण कादंबरीचे प्रकार केले आहेत. त्याच प्रमाणे एखादी भूमिका घेऊ , समस्येचे चित्रण करणारी कादंबरीस 'समस्याप्रधान कादंबरी 'म्हटले जाते.

परंतु; मला येथे मांडायचे आहे की, समस्येच्या केंद्रकाभोवती एखादा लेखकाने कथाकन अथवा रचनाबंधाचे सर्व घटक समस्येला अनुलक्षून, एखाद्या समस्येची मांडणी केलेली असेल, समस्येच्या शोधाचे 'भाण 'ठेवून ती कलात्मक अनुभूती सिध्द झालेली असेल, तर; त्या कलाकृतीला 'समस्याप्रधान' कलाकृती म्हटले जावे. कादंबरीचा आकृतिबंध समस्येच्या अनुषंगाने, अनुभूतीचे चित्रण वास्तव पातळीवर झालेले असेल , तशी जाणीवही अभिव्यक्त होत असेल तर, ती समस्याप्रधान कलाकृती म्हटली पाहिजे. असे या ठिकाणी मला नोंदवावे वाटते.

समस्याप्रधान कादंबरी म्हणजे काय? असा प्रश्न केल्यास त्यांची सुसष्ट व्याख्या करता येणे कठीण आहे. कारण साहित्य हा विषय साचेबंध नसतो. तो व्याख्येत बसत नाही ती सर्जनशील निर्मीत आहे.. मला वाटते 'समस्याप्रधान कादंबरी' म्हणजे अशी साहित्यलेखन कृती की, ज्यामध्ये एखाद्या

समस्येला केद्रक ठरवून त्या प्राधान्य रूपाने निर्माण झालेली समस्या ही, सर्व समाज जीवनाला व्यापलेली असते, त्याच्या दुरगामी परिणाबाबत मुलगमी चिंतन करणारी, त्या समस्येला कारण, उत्पत्तीची चर्चा करणारी संवेदनशिलता.

कारणाबाबत चिंतन करणारा, भूमिका घरणारा दृष्टीकोण हा, 'समस्याप्रधान' कादंबरीचा प्रेरणास्त्रोत असतो. उपरोक्त वैशिष्ट्याचा अर्तभाव असलेली साहित्य कृतीला समस्याप्रधान कादंबरी म्हटले जाते..

समस्या प्रधान कादंबरी 'पाडा'

मराठी साहित्यातील ग्रामसंस्कृतितील समाजजीवनाचा वेध घेणारी प्रामुख्याने कृषिनिष्ठ जीवन जगणाऱ्या चांगदेव तापकिर या शैतिनिष्ठ जीवनाची वाताहत झालेल्या केळी उत्पादक, शेतकऱ्याची दुःखद काहणी 'पाडा' या कादंबरीत लेखक अशोक कौतिक कोळी यांनी रेखाटलेली आहे. कृषिसंस्कृतीवर आघात करणाऱ्या अनेक बाबी आहेत. सर्वात मोठी आघात करणारी गोष्ट म्हणजे सर्वदूर शेतकऱ्याला वाटयला येणारी व त्याच्या जगण्याचे गणित बिघडविणारी गोष्ट म्हणजे शेतमालाला भाव, योग्य दर न मिळण्याची समस्या. ही समस्या केळी उत्पादक, संत्रा बागयदार, द्राक्षे, बागायतदार याप्रमाणे इतरही शेतमाल उत्पादकाच्या बाबतीत त्यांच्या जीवनाचा गळा दाखवणारी बाब आहे.

योग्य तो भाव न मिळण्याची समस्या संबंध देशभर कमी अधिक स्वरूपात आहे. प्रस्तुत कादंबरी 'पाडा' मध्ये केळी उत्पादक शेतकऱ्याची समस्या अशोक कौतिक कोळी यांनी रेखाटलेली आहे. खानदेशातील केळी उत्पादक शेतकरी चांगदेव तापकिर हा अल्पभूधारक बागायतदार, आणि वर्षानुवर्ष केळी पिकवतो. बागायतदार म्हटला की, कोरडवाहु शेतकऱ्या पेक्षा बऱ्यापैकी असेलला हा शेतकरी आहे. असे आपणास वाटते. परंतु हा खोटा भ्रम आहे. असे कादंबरी वाचल्यावर लक्षात येते. केळीचा 'पाडा' पिकायला येतो. तरी, व्यापारी योग्य असा भाव देत नाहीत, रक्ताच पाणी आटवून रात्रदिवस शेतात राबणारा शेतकरी आपल्या मुलाबाळांसरख केळीचा सांभाळ करतो.

खर्च वारेमाप करूनही व्यापाऱ्याचे भाव पाडणाऱ्या धोरणामुळे, केळी उत्पादक शेतकऱ्यांच्या सोसायट्यातील घराणेशाही राजकारणामुळे, सोसायट्या मध्ये शेतकरी असतानाही व्यापारी दलाल दरसाल अडवणुक करून भावपाडून शेतकऱ्याची शिकार करतात. केळीचा योग्य दर, भाव मिळावा म्हणून शेतकरी व्यापाऱ्यांच्या विरोधात केळी फेको आंदोलन करतात, तरी मात्र केळीला भावच मिळू दिला जात नाही. कारण शेतकरी पिकावयाचे धणी आहे. परंतु भाव ठरवण्याचा अधिकार त्याला नाही. या बाबत 'पाडा' कादंबरीतला चांगदेव भाष्य करतो. जन्मदात्याला मालक ठरू न देत.

नाहह, टाईमावर दुसऱ्याच्या तोंडाकडे पाहव लागत, आपुन पिकव्याचे ,जलम द्याचे धनी, येच्या उपपर आपल्या हाती काही नायी. त्येच्यांन शेतकरी कुयुझन, कुयुझून मरू राहाले. हमेशकरता मरण हायच त्येचे नसीबी, दलाल, गब्बर हून राहले, त्येच्या जीवावर. शेतकऱ्याच रगहत वरपून-वरपून सारे सोकावून राहिले, भडविचं-थामल पायझे हे। पृ७९

असा चांगदेव तापकीरचा उद्वेग मन खिन्न करणारा आहे. शेतकऱ्यांच्या दुःखाची व्यथांची करूणांमय काहाणी सांगणारा दुःखाचा वेदना ग्रंथच आहे. शेतकऱ्यांच्या जीवावर पोसली जाणारी शोषणकारी समाजव्यवस्था, शेतकऱ्यांच्या वाट्याला सुखाचे दिवस येवून देणार नाही. नोकरशाही, राजकारणी, सरकारचे आयात-निर्यातीच्या धोरण ठरविण्यासाठी जरी शेतकऱ्यांची पोरं असली तरी, शोषणाचे दात त्यांचेच मोठे आहेत. याच प्रत्यंतर एका प्रसंगातून लेखक रेखाटतात.

चांगदेव तापकीर च्या नेतृत्व एम.सीबीच्या कार्यालयात मोर्चा नेला जातो, इंजिनियर साहेब शेतकऱ्यांचा गऱ्हाण ऐकून घेत नाही. साहेब शेतकऱ्यांचाच मुलगा आहे असे इंजिनियर साहेब स्वःता सांगतो, तेव्हा चांगदेव म्हणतो "त्येस म्हणयाचे हे मग आमाले, शेतकऱ्यांच्या मुलगा आसुन आम्हच्या पुळका काहुन यु नि राहला तुम्हाले? शेतकऱ्यांचा हिरव कायीज करपून राहल ते दिसत नाही का तुम्हाले ?३७ शेतकऱ्यांचा सर्वस्व म्हणजे त्याचे शेती. त्यातील पिकपाणी, परंतु लोडशेडींग सुरू झाल्यावर केळी करपून जा लागली परंतु कारखाण्यासाठी शहरासाठी दिवसरात्र लाईट दिली जाते.

शहर लाईटात अन् आमी अंधारात.असे तो म्हणतो. शेतकऱ्याला मात्र लोडशेडींगचा समाना करावा लागतो. अशा नानाविध समस्यांचे चित्रण 'पाडा' मध्ये अशोक कोळी यांनी केले आहे. पिढ्यापिढ्या खुडून खाणाऱ्या या व्यवस्थेत व्यापारी अडते, दलाली एंजेट यांची शेतकऱ्यांकडे पाहण्याची दृष्टी तुळतेची आहे. हलकट, लाचार असे म्हणून तो हिणवल जातो. कधी शेतकरी राजा म्हणून जखमेवर मिळ चोळल जाते. या विषयची खदखद व्यक्त करतांना या कादंबरीतली प्रमुख व्यक्तीरेखा चांगदेव तापकीर म्हणतो, हमालावून बी निपत्तर जीवन हाय आमचं.

हलकट अडाणी.समझते आमाले हल्ली नीरा व्यापारी. ह व्यापाऱ्यांनी शेतकऱ्यांलं निन्हा हलकट समजते आम्हाले. आम्ही पिकवतो म्हणूनच कमीशन खायाले भेटायलं तुम्हाले. पृ. ३९. शेतकऱ्यांच्या जीवावर मोठे होणारे कमीशन एजेटं मात्र शेतकऱ्यांना हलकट समजातात. बाजार समितीत शेतकरीच संचालक असले तरी, व्यापारी अडत्याचीच मार्कटात चलती असते. संचालक मंडळ व्यापाऱ्यांच्याच हुकमावर चालते या विषयी तो म्हणतो.

'तुम्हाले काय वाटते बाजार समित्याचे संचालक मंडळ आपलं होय, आसं मुळीच नायी, वन्हून वाटते आसं तर, परतेकशाथ न्यार हे । मुखवटा शेतकऱ्यांचा आनू चेहरा व्यापाऱ्यांचा हाये संचालक मंडळाचा बी. पृ. ७८. असा शोषणाचा छुपा चेहरा येथे दिसून येतो. केळी उत्पादक शेतकऱ्यांच्या भाववाढीच्या समस्यांच्या मुळाशी जाऊन त्यांचं म्हणणं बोलीभाषेत वास्तव रेखाटन केले आहे.

केळी उत्पादक शेतकऱ्यांच्या जीवनात. अनेक समस्या उद्भवतात त्याची कारणे दाखवून दिले आहे. लेखकाचे सखोल चिंतन कलात्मक पातळीवर वाचकांच्या मनाला विलक्षण अनुभव, पाडा ही कादंबरी देते. ही कादंबरी 21व्या शतकातील शेतकऱ्यांची सर्वांगिन व्यथा मांडणारी कादंबरी आहे असे मला वाटते. गढूळ राजकारण आणि सरकारचे ध्येयधोरण याचे परिणाम शेतकऱ्याला भोगावे लागतात. हीजाणीव प्रगल्भतेने

व्यक्त होताना दिसून येते. म्हणूनच केळी उत्पादक शेतकऱ्याला योग्य असा भाव मिळत नाही, केळी उत्पादक शेतकऱ्याला सोसायट्यात्यातील राजकारण, व्यापारी अडत्याचे कमिशन यामुळे केळी बागतयदारास केळीचे उत्पन्न परवडत नाही. व्यापाऱ्याची ऐकी व भाव पाडण्याचा एकत्रित प्रयत्न. शेतकऱ्यांनी कितीही आंदोलने मोर्चे काढले तरी, शेतमालाल योग्य दर न मिळण्याची समस्या केळी उत्पादक शेतकऱ्याला जीवनाची व्यथा वाढवते.

याचे वास्तववादी चित्रण या 'पाडा' या कादंबरीत कोळी यांनी केले आहे. वऱ्हाडी , खानदेशी बोलीतील संवाद, त्यातून प्रसंगाची केलेली मांडणी वाचकाला खिळवून ठेवते. केळी उत्पादक शेतकऱ्याची समस्या ही, त्यातील पात्र, व्यक्तीरेखा, घटना, प्रसंग ,संवाद आणि समस्याप्रधान कथानक, केळी उत्पादक शेतकऱ्याच्या समस्यांचा परिघ व्यापून आहे. म्हणूनच मराठी कादंबरीतील वैशिष्ट्यपूर्ण कादंबरी 'पाडा' ही आहे.

केळी उत्पादक शेतकऱ्याच्या विविध प्रश्नांचे चिंतन करणारी त्याच्या उत्थानासाठी संघर्षात्मक भूमिका घेणारी 'पाडा' ही कादंबरी कलात्मक दृष्टीनेही मनाला व्यथित करते चिंतन करायला भाग पाडते. भाव न मिळाल्यामुळे शेतकऱ्याचे जगण्याचे गणित बिघडते परिणामी रस्त्यावर केळी फेकण्याची दुर्दैवी वेळ येते. पोरीचे लग्न जुळले असताना केळीच्या पाड्याला भाव न मिळाल्यामुळे चांगदेव च्या मुलीचे ठरलेला हुंडा देता येत नाही. हुंड्यासाठी अडवणूक होते, लग्नाच्या बस्ता त्यालाही पैसे नसतात. त्यामुळे लग्न मोडते सुनिताचे लग्न मोडल्यामुळे कमळा बाईला वेड लागते. पण, ती हार मानत नाही.

चांगदेव तापकीरन केळीपाडा तोडून ट्रॅक्टर मार्केटात नेलेला असतो भाव न मिळाल्यामुळे केळी फेकू आंदोलनात तो सगळ्या केळी रस्त्यावर फेकून देतो ही बातमी कमळाबाईला माहित पडते तेव्हा त्यांच्यावर दुःखाचा आघात कोसळतो पुढे पत्नी कमलाबाई आजारी पडते तिच्या दवाखान्याचा खर्च झोपावत नाही. केळीला भाव न आल्यामुळे तो दवाखान्याचा खर्च करू शकत नाही. पत्नीला वाचवण्यासाठी तो बैल जोडी बाजारात नेतो, तेव्हा त्याचं काळीजच बाजारात विकून टाकला असं त्याला वाटतं इतकं सारं करूनही पत्नी मात्र औषधा अभावी दवाखान्यात मारते. असं मनाला हेलावून सोडणार हा प्रसंग वाचकाच्या मनाला अस्वस्थ करून जातो.

केळी उत्पादकांच्या समस्येच्या अनुषंगाने ग्रामीण व्यवस्थेचे आजच्या वर्तमान काळात कसे धिंडवडे उडाले आहेत हे लक्षात येतं. हे विदारक सत्य लेखक कलात्मक पातळीवर प्रभावीपणे मांडतो. समस्येचा विविध बाजू समजून उमजून घेतल्यानं कथानकाची रचना, त्यातील व्यक्तीरेखा, प्रसंग, घडणाऱ्या अनुषंगीक घटना, त्यातून येणारे संवाद त्याला खुलवणारी वऱ्हाडी-खानदेशी बोली याचा सुरेख वापर कोळी यांनी केला आहे. या कादंबरीत समस्येच्या केंद्रकाला कलात्मक पातळीवर चित्रित केलेले आहे. म्हणूनच 'पाडा' ही 'समस्याप्रधान कादंबरी' मराठी साहित्यातील उल्लेखनीय कादंबरी आहे.केळी उत्पादक शेतकऱ्यांचे प्रश्नांची चर्चा करणारी , संवेदनाशील चिंतन मांडणारी, आजच्या शेतकऱ्याचे प्रश्न

आणि समस्या याची मांडणी करणारी, त्यांच्या समस्येची कारणे आणि त्यावर उपाय सूचवणारी ही कादंबरी आहे, असे स्पष्टपणे मला नोदवावे वाटते.

सारांश

समस्याप्रधान कादंबरी म्हणून 'पाडा' ही अशोक कौतीक काळी यांची कादंबरी केळी उत्पादक शेतकऱ्याची समस्या विविधांगी समजून घेण्याचा कलात्मक प्रयत्न, लेखकाने केलेला आहे. या कादंबरीतील मुख्य व्यक्तीरेखा चांगदेव तापकीर, त्याची पत्नी कमळाबाई. तिचा दवाखान्या अभावी झालेला मृत्यू, मनाला हेलावून सोडतो. बसता घेण्यासाठी वेळेवर पैसे नसल्यामुळे लग्न मोडते बहिणीच्या घरी हुंडा दिला जाईल म्हणून लग्न ठरते, पण, व्यापारी केळीबाग विकत घेत नाहीत, भावासाठी अडवणूक करतात परिणामी बाग सडतो पाळा विकल्या जात नाही.

ठरलेला हुंडा ह न दिल्यामुळे सुनीताच्या सासरहून सुनिता जळाल्याची बातमी येते. जाळून मारले जाते. मनाला चटका लावणारे शेतकरी जीवनाचे चित्रण पाडा मध्ये आहे. म्हणजे शेतीचे अर्थकारण बिघडले की, शेतकऱ्यांची कशी दैना होते किती समस्या ओव्या होतात. याचे वास्तववादी चित्रण या कादंबरीत झालेले आहे. जागतिकीकरण, औद्योगिकीकरण आणि सरकारचे आयात-निर्यातीच्या धोरण, वाढता खर्च यामुळे अलीकडच्या काळात अनेक शेतकऱ्यांनी आत्महत्या केल्या आणि आजही होत आहेत. हे वास्तव चित्र कधी बदलणार ? हा प्रश्न आहे. ग्रामीण समाज जीवन असं समस्यांनी घेरलेला आहे.

केळीच्या पाडाला भाव मिळण्यासाठी शेतकरी आंदोलन करतात. परंतु; व्यापारी एजेटं याचे शोषण करण्याचे धोरण थांबवता येत नाही. अशी खंत येथे व्यक्त केली आहे. शेतमालाला भाव मिळण्यासाठी खुपदा आंदोलने केलीत परंतु, शेतकऱ्याला त्याच्या कष्टाच्या पिकाला भाव ठरविण्याचा अधिकार, आजही मिळाला नाही. हे वास्तव सत्य जाणिव, बदलते ग्राम वास्तव, पाडा या कादंबरीत अधोरेखित केलेले आहे. केळी उत्पादक शेतकऱ्याच्या समस्येचे मुलगामी चिंतन, त्या समस्येवर उपाययोजना सुचविणारे शेतकऱ्यांना संघर्षासाठी मानसिक बळ देणारी सर्जनात्मक भूमिका 'पाडा' या कादंबरीत कलात्मकतेचे भाण ठेवून चित्रित झालेली आहे. समस्याप्रधान कादंबरीचे सर्व वैशिष्ट्ये या कादंबरीत दृष्टीपथास येतात. यात मूळीच शंका नाही.

21 व्या शतकाचे भान राखणारी, ग्रामीण जीवनाची व्यथा मांडणारी, नवे प्रश्न आणि समस्या व आव्हाने याची कलात्मक वेध घणारी ही कादंबरी आहे.

निष्कर्ष

1. समस्याप्रधान कादंबरीत एखाद्या समस्येचे मुलगामी चिंतन केलेले असते.
2. समस्येच्या सर्व बाजूनी जाणिवपूर्वक मांडणी करण्याचा कादंबरीकार प्रयत्न करतो. समस्ये च्या सुत्रा भोवतीचा रचनाबंध आहे..

3. सन २००० नंतर आलेल्या आर्थिक धोरणामुळे ग्रामसमाज जीवनात अनेक समस्या उद्भविल्या आहेत. त्याबाबत सजग चिंतन करायला हवं, हे भाण कादंबरीकाराला आहे.
4. 'पाडा'कादंबरीत केळी उत्पादक शेतकऱ्याला योग्य तो बाजारभाव न मिळाल्याने शेतकऱ्याचे कुटुंब उध्वस्त होते.
5. या कादंबरीच कथानक समस्येच्या विविध बाजू अधोरेखित करतं. आजचा शेतकरी व्यवस्थेच्या विरोधात संघर्षाची भूमिका घेतल्याचे चित्रण या कादंबरीत आहे.

संदर्भ

1. प्रा. डॉ. वासुदेव वले, जागतिकीकरणाचा मराठी साहित्यावर प्रभाव, प्रशांत पब्लिकेशन (२०१४) जळगांव.
2. डॉ. किशोर सानप, मराठी कादंबरी नव्या दिशा, निर्मल प्रकाशन २०००५, नांदे
3. समस्याप्रधान कादंबरी, अक्षरवेर्भी, २०००८ लेख, डॉ. अरुण कृष्णा शिंदे
4. वासुदेव मुलाटे. ग्रामीण साहित्य चिंतन आणि चर्चा, स्वरूप प्रकाशन २००५ औरंगाबाद
5. कोळी अशोक कौतिक, 'पाडा' शब्दालय प्रकाशन, २००६ श्रीरामपुर.
6. मराठी कादंबरी प्रेरणा व स्वरूप ,लेख १९८०, डॉ. भालचंद्र नेमाडे.

Structural and spectral studies of Ce³⁺ ...
tandfonline.com/doi/full/10.1080/10667857.2020.1859052

Home | All Journals | Materials Technology | List of Issues | Volume 37, Issue 7 | Structural and spectral studies of Ce³⁺ ...

Materials Technology
Advanced Performance Materials
Volume 37, 2022 - Issue 7

Submit an article | Journal homepage

285 Views
11 CrossRef citations to date
8 Altmetric

Research Article
Structural and spectral studies of Ce³⁺ doped Sr₃Y(BO₃)₃ nano phosphors prepared by combustion synthesis
Sanjay Prakash Hargunani, Rajkumar Pandurang Sonekar, Anoop Singh, Ajit Khosla & Sandeep Arya
Pages 450-461 | Received 04 Sep 2020, Accepted 19 Nov 2020, Published online: 09 Dec 2020
Cite this article | <https://doi.org/10.1080/10667857.2020.1859052> | Check for updates

Full Article | Figures & data | References | Citations | Metrics | Reprints & Permissions | Read this article

ABSTRACT
In this work, a series of Ce³⁺ activated Sr₃Y(BO₃)₃ phosphors were synthesized by the solution combustion method. The synthesized phosphors were characterized via X-ray diffraction (XRD), scanning electron microscopy (SEM) and Fourier transform infrared

Related Research
People also read | Recommended articles | Cited by 11

Sample our Physical Sciences Journals
-> Sign in here to start your access

Search | 12:17 PM

PAPER • OPEN ACCESS

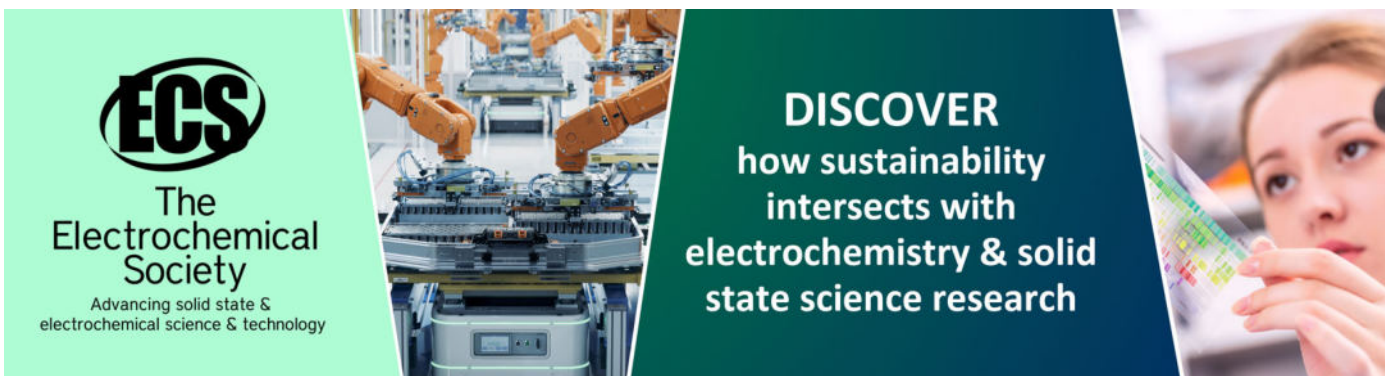
Combustion synthesis of $\text{Ba}_3\text{Y}_{1-x}\text{Sm}^{3+}_x(\text{BO}_3)_3$ as red-light emitting phosphors for indoor plant cultivation applications

To cite this article: S P Hargunani *et al* 2021 *J. Phys.: Conf. Ser.* **1913** 012016

View the [article online](#) for updates and enhancements.

You may also like

- [Crystal structure and luminescence properties of thermally stable \$\text{Sm}^{3+}\$ -doped \$\text{Sr}_3\text{In}\(\text{PO}_4\)_7\$ orange-red phosphor](#)
Ke Su, Qianxin Zhang, Xuening Yang et al.
- [\$\text{SrIn}_2\text{O}_4:\text{Eu}^{3+}, \text{Sm}^{3+}\$: A Red Emitting Phosphor with a Broadened Near-Ultraviolet Absorption Band for Solid-State Lighting](#)
Panlai Li, Zhijun Wang, Zhiping Yang et al.
- [Energy transfer mechanism from \$\text{Gd}^{3+}\$ to \$\text{Sm}^{3+}\$ in \$\text{K}_3\text{Gd}\(\text{PO}_4\)_2:\text{Sm}^{3+}\$ phosphor](#)
Palvi Gupta, A K Bedyal, Vinay Kumar et al.



ECS
The
Electrochemical
Society
Advancing solid state &
electrochemical science & technology

DISCOVER
how sustainability
intersects with
electrochemistry & solid
state science research

Combustion synthesis of $\text{Ba}_3\text{Y}_{1-x}\text{Sm}^{3+}_x(\text{BO}_3)_3$ as red-light emitting phosphors for indoor plant cultivation applications

S P Hargunani^{1*}, R P Sonekar¹, Harmanpreet Kaur², J G Mahakhode³ and Samikha B Dhoble⁴

¹Department of Physics, G. S. College Khamgaon, India

²Department of Physics, University Institute of sciences, Chandigarh University, Mohali-140413, India

³Department of Electronics, D.B. Science College, Gondia-441614, India

⁴Department of Physics, R.T.M. Nagpur University, Nagpur, India

E-mail: spargunani.sh@gmail.com

Abstract. In this paper, a series of Sm activated $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ phosphors are synthesized by high-temperature solution combustion method. The concentration of Sm ions is changed from 1 to 5 mol% in the host lattice of BYB crystal. The crystal structure, phase of formation, particle size, elemental analysis, photoluminescence study of synthesized phosphors are done using X-ray diffraction, FE-SEM, Fourier transform infrared spectroscopy (FTIR) and photoluminescent (PL) techniques. The excitation spectra consisted of strong bands in the NUV and blue region. The phosphors on excitation at 449 nm exhibited a strong emission peak in the region 630–660 nm, which corresponds to the absorption spectra of PR phytochrome. The obtained photometric results show that these can be used for the design of light-emitting diodes for indoor plant applications, houseplants gardening and in horticultural fixtures.

Keywords: Red phosphor; samarium; BYB crystal; Indoor plants; phytochrome.

1. Introduction

In the recent scenario, innovations of “horticulture” has been increasing tremendously due to its advantages over the conventional approaches used for the growth of plants under sunlight. Undoubtedly, “natural and artificial” light plays a pivotal role in the development of plants via different plant mechanisms [1–4]. In plants chlorophyll A, chlorophyll B absorbed the light in UV-blue region in the range 420–500 nm and phytochrome (P_R), phytochrome (P_{FR}) absorbed the light in the “red and far-red” region from 640 to 750 nm. [5–7]. The red color plays a vital role in plant growth. Therefore much emphasis has been paid on the development of red phosphors for indoor plant lighting devices. Up to now, many Mn^{4+} and Eu^{3+} doped phosphors have been reported as red light-emitting phosphors for room and greenhouse plant requirement [8–11]. This is due to the reason the emission spectral line of these phosphors match well the absorption lines of Phytochrome P_R . In a recent study by Rajendran and Vaidyanathan [12], authors reported for the first time Sm^{3+} activated $\text{NaSrY}(\text{MoO}_4)_3$ phosphors for the fabrication of LEDs for plant growth. In the present report, Sm^{3+} activated $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ phosphor



for indoor plant applications synthesized via combustion route. It is found that under blue excitation at 449 nm, the phosphors exhibit wide emission spectra from 630nm to 660 nm, which matches well with the absorption spectra of P_R . Thus, this phosphor can be used for the development of Light emitting diodes for in-house plant applications, for sun-shed plant growth, and indoor gardening.

$Ba_3Y(BO_3)_3$ belongs to the $M_3Ln(BO_3)_3$ family [13]. The BYB crystal exists in two structures i.e., low-temperature α - $Ba_3Y(BO_3)_3$ with space group $P6_3cm$ and high-temperature β - $Ba_3Y(BO_3)_3$ with space group $R3$. The photoluminescence properties under doping are different for both phases. The structure of low-temperature phase α - $Ba_3Y(BO_3)_3$ is consist of boron atoms with three fold coordinates, yttrium ions having sixfold coordinates, barium atoms having nine and six coordinates[14]. Maggayet *al.* synthesized the $Ba_3Y(BO_3)_3: Eu^{3+}, Bi^{3+}$ phosphor via solid-state reaction and studied it as a phosphor for w-LEDs using N-UV LED chips [15]. Wu *et al.* described $Ba_3Y(BO_3)_3: Sm^{3+}$ as potential orange-red phosphors for white LEDs [16]. Yu *et al.* investigated luminescent and energy transfer in α - $Ba_3Y(BO_3)_3: Ce^{3+}, Tb^{3+}$ [17]. In the present work, the synthesis of $Ba_3Y(BO_3)_3$ phosphors by solution combustion method is a new approach. The luminescent properties of Sm^{3+} activated $Ba_3Y(BO_3)_3$ prepared by solution combustion method is not described yet. All the results are studied in detail.

2. Experimental

2.1 Materials & synthesis

Sm activated $Ba_3Y(BO_3)_3$ phosphors were synthesized using modified solution combustion route. SCS involves highly exothermic redox chemical reaction. It is chain of flaming, smoldering and explosive reaction. The starting precursors $Ba(NO_3)_2$, $Y(NO_3)_3$, H_3BO_3 , and $Sm(NO_3)_3 \cdot 6H_2O$ of analytical grade were taken according to stoichiometric ratio $Ba_3Y_{1-x}Sm_x(BO_3)_3$ ($x= 0.005, 0.01, 0.02, 0.03, 0.04, 0.05$ 0.01). As a source of Boron, Boric Acid is used. The compound is neutral. So neither extra oxidizer nor fuel is necessary for solution combustion synthesis. In 10 to 20ml double distilled water all precursors were dissolved. In this solution, fixed amount urea as a fuel was added calculated using propellant chemistry [18]. The solution was stirred on hot plate magnetic stirrer maintained at a temperature of 90 °C for 50 min. The viscous solution formed was transferred to Platinum crucible and kept into a 700 °C preheated muffle furnace. Within few minutes, the water evaporated and combustion reaction took place with the liberation of gases. The resulting foamy powder was grounded gently into a fine powder and subjected to further heat treatment at 950°C for 5 hours in a muffle furnace in reducing environment. Reducing environment was developed using activated charcoal. After heating the obtained phosphors were grounded into fine powder and used for further characterizations.

2.2 Characterizations

XRD of synthesized phosphor were recorded by Rigaku Miniflex II X-ray diffractometer using the $Cu-K\alpha$ radiations ($\lambda= 1.54060 \text{ \AA}$) and scanning in the 2θ range from 10-80°. The obtained patterns were compared with the available ICSD file. The Fourier transform infrared spectra (FTIR) were recorded in the 300-4000 cm^{-1} range using FTIR spectrophotometer Model RZX (Perkin Elmer). The surface morphology and elements studies were done by scanning electron microscopy [Model JSM6100 (JEOL)]. The emission and excitation spectra were recorded using F-7000 FL spectrophotometer with a scan speed 240 nm/min. The width of the slit for excitation-emission spectra was set 1nm. All the characterizations were done at room temperature.

3. Results and Discussion

X-ray diffractograms were recorded to determine the phase and crystal structure of the synthesized phosphors. $Ba_3Y(BO_3)_3$ host lattice possesses hexagonal crystal structure with the space group $P6_3cm$ (No.185). All B^{3+} ions are coordinated with three O^{2-} ions forming the BO_3^{3-} triangles. Y sites with six co-ordination number and Ba sites with 9 co-ordination number are separated by parallel planes of BO_3^{3-} anion group. The crystal structure is comprised of isolated BO_3 triangles, YO_6 octahedral and

BaO₄ polyhedral. Figure 1 represents the XRD patterns of Ba₃Y_{0.97}(BO₃)₃:0.03Sm³⁺ phosphors. The XRD patterns are well-matched with the standard inorganic crystal structure (ICSD) file (reference no. 99537) of the Ba₃Y(BO₃)₃ structure.

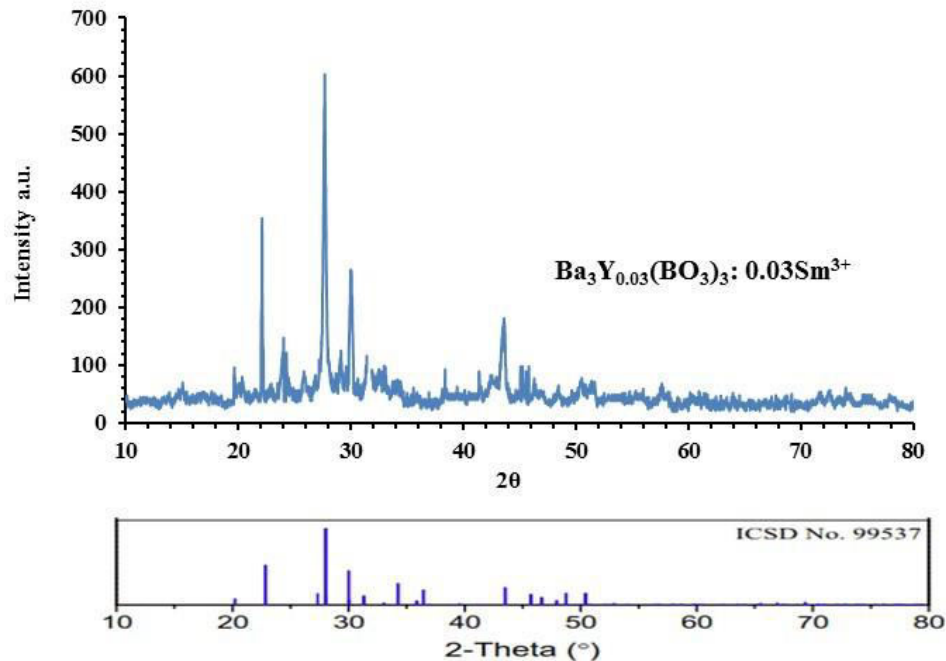


Figure 1. XRD & ICSD file of Ba₃Y_{0.97}(BO₃)₃:0.03Sm³⁺ phosphor

Figure 2 represents the FTIR spectra of the Ba₃Y_{0.97}(BO₃)₃:0.03Sm³⁺ sample in the region 300–4000 cm⁻¹. The strong bands above 1100 cm⁻¹ are due to the B–O stretching mode of the triangular [BO₃]⁻ groups [19]. The bands in the range 700–800 cm⁻¹ correspond to the B–O out of plane bending vibration, which confirms the presence of the [BO₃]⁻ groups. Due to the complete combustion of nitrate and organic matter peaks in 1500–2000 cm⁻¹ were absent. The presence of peak at 523 cm⁻¹ relates to the Y–O vibrational motion [20].

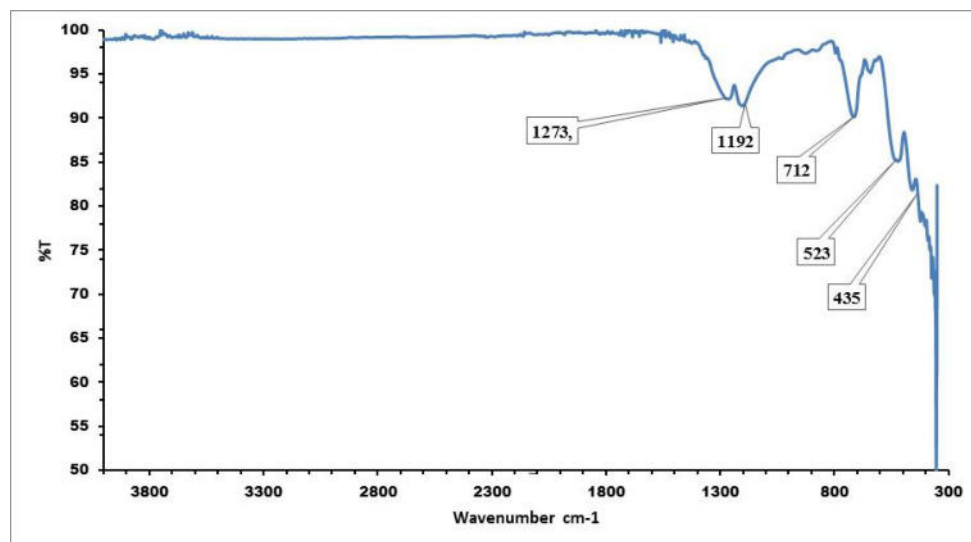


Figure 2. FTIR of Ba₃Y_{0.97}(BO₃)₃:0.03Sm³⁺

The “SEM micrographs” of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ phosphors at various magnifications are displayed in figure 3 (a-b). From the microstructures, it seems to be that the particles consist of non - uniform grains with agglomeration. The cause of the agglomeration is due to the high-temperature treatment [21]. The “Average particle size” is in the sub-micrometer range due to the “agglomeration of the particles”. Fig. 4 represents the EDX spectra of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ phosphors. The spectra consist of Ba, Y, B, O, and Sm elements. No other elements than these are found, which represent that organic residues are completely removed. These results are “Consistent with the FTIR and XRD” results.

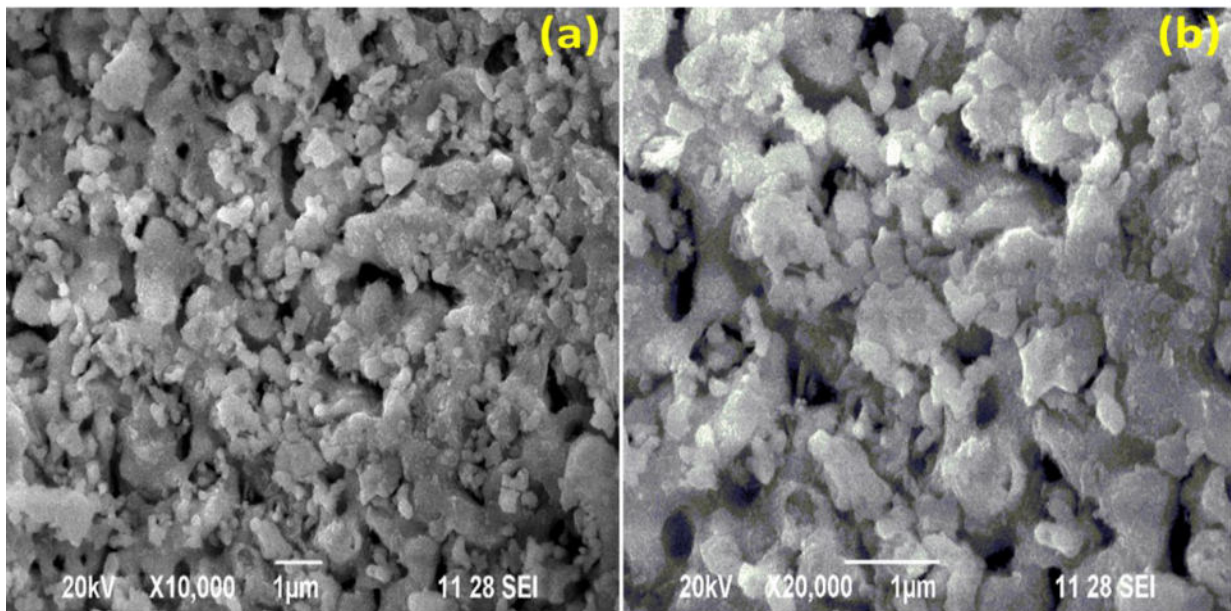


Figure 3. (a-b) SEM micrographs of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ phosphor at different magnifications

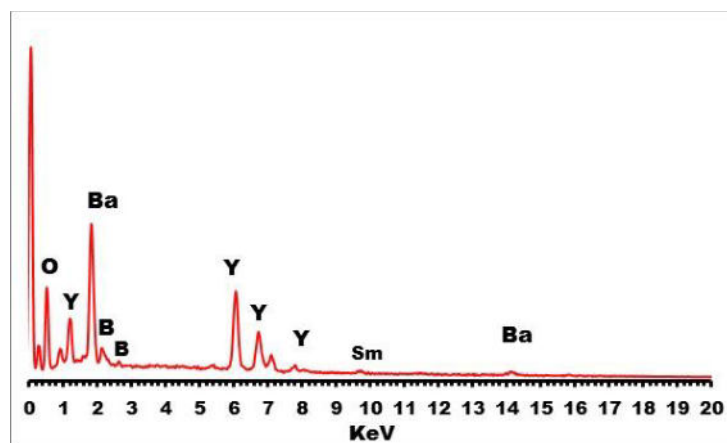


Figure 4. EDX spectra of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ phosphor

Figure 5 represents the PL excitation spectra (PLE) of $\text{Ba}_3\text{Y}_{0.03}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ recorded in the region 300-550 nm at 644 nm emission wavelength. PLE spectrum consists of three main peaks at 388 nm (${}^6\text{H}_{5/2}$ to ${}^6\text{P}_{7/2}$), 449 nm (${}^6\text{H}_{5/2}$ to ${}^4\text{P}_{7/2}$), and 487 nm (${}^6\text{H}_{5/2}$ to ${}^4\text{I}_{11/2}$) [22]. The intensity of the PLE peak at 449 nm is highest. Figure 6 shows the PL of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ under 449 nm excitation. At 449 nm excitation, the PL spectra show three emission peaks centered at 590 nm, 644 nm, and 651 nm which are due to intra 4f shell transitions from excited level ${}^4\text{G}_{5/2}$ to ground level ${}^6\text{H}_{5/2}$, ${}^6\text{H}_{7/2}$, ${}^6\text{H}_{9/2}$ of

Sm^{3+} ions, respectively [23]. The broadband in the region 630-660 nm well matches with the absorption spectra of Pr_R . Thus, $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3: 0.03\text{Sm}^{3+}$ phosphor can be used to modulate plant growth. The peak at 590 nm corresponding to the $^4\text{G}_{5/2}$ to $^6\text{H}_{5/2}$ transitions is magnetic dipole transition and does not affect by crystal field. The peak at 644 and 651 nm were related to the $^4\text{G}_{5/2}$ to $^6\text{H}_{9/2}$ is electric dipole transitioning and dependent on the crystal field. Mostly, the “Intensity of electric dipole transition to the intensity of Magnetic dipole transition” is used to determine the symmetry of local surroundings of Sm^{3+} in the crystal [16,24,25]. It is found that that the “Ratio of the Intensity of the Electric to Magnetic Dipole Transition is less than one”, which represents that the Sm^{3+} ions have occupied the symmetry position in the host crystal lattice. The emission spectra of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3: 0.03\text{Sm}^{3+}$ is also recorded under excitation at 388 nm, as shown in figure 7. The peak shape of all the samples was the same except noticeable change in intensity of peaks at 590 nm and 644 nm. To study the phenomena of concentration quenching in $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Sm}^{3+}$ ($x= 0.01, 0.02, 0.03, 0.04, 0.05$), the emission spectra are recorded at 449 nm excitation wavelength. PL spectra of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Sm}^{3+}$ phosphors are shown in figure 8. It can be seen from fig. 8 that P-L intensity increases with an increase in the Sm^{3+} ion concentration. The optimum Photo-Luminescence intensity is noticed for $x=0.03$, and beyond this concentration quenching followed. The probable reason of concentration quenching is increase in non-radiative transitions. The variation in the intensity with Sm concentration is shown in figure 9.

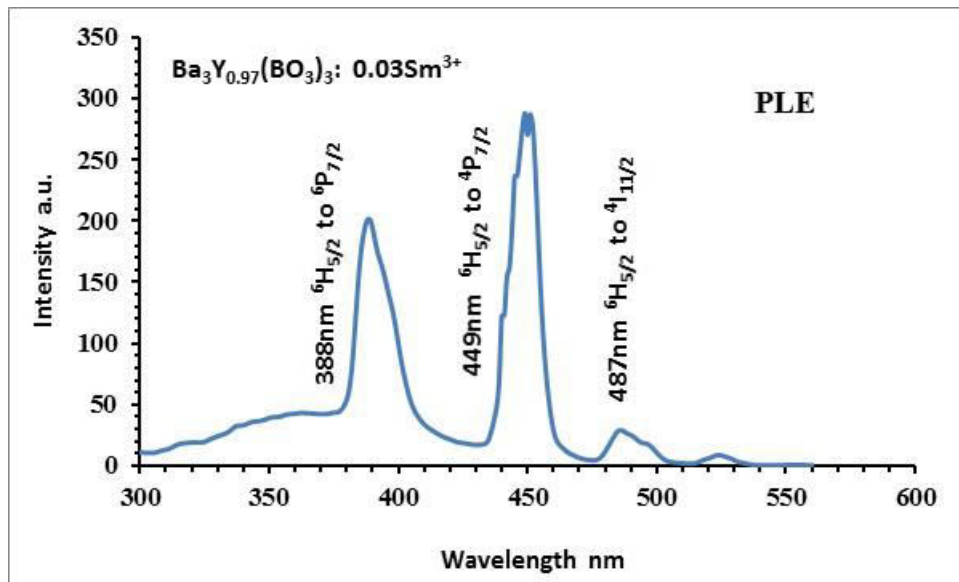


Figure 5. PLE of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ at room temperature

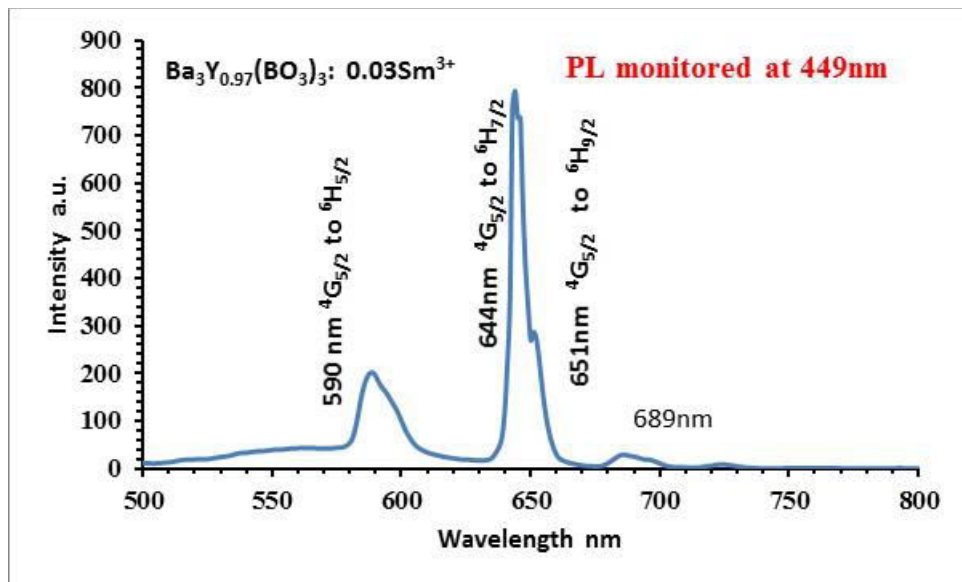


Figure 6. PL emission spectra of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ at room temperature

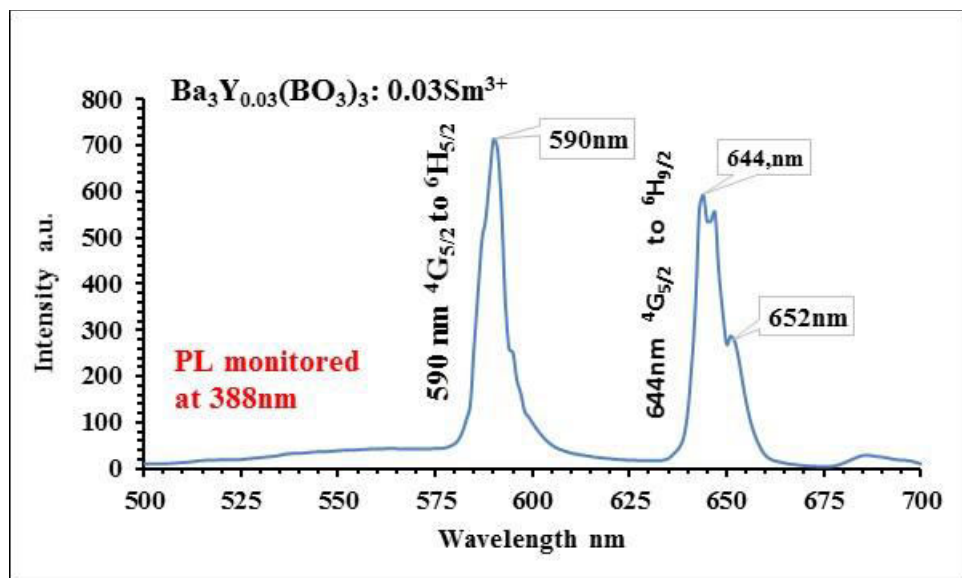


Figure 7. PL of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ at room temperature

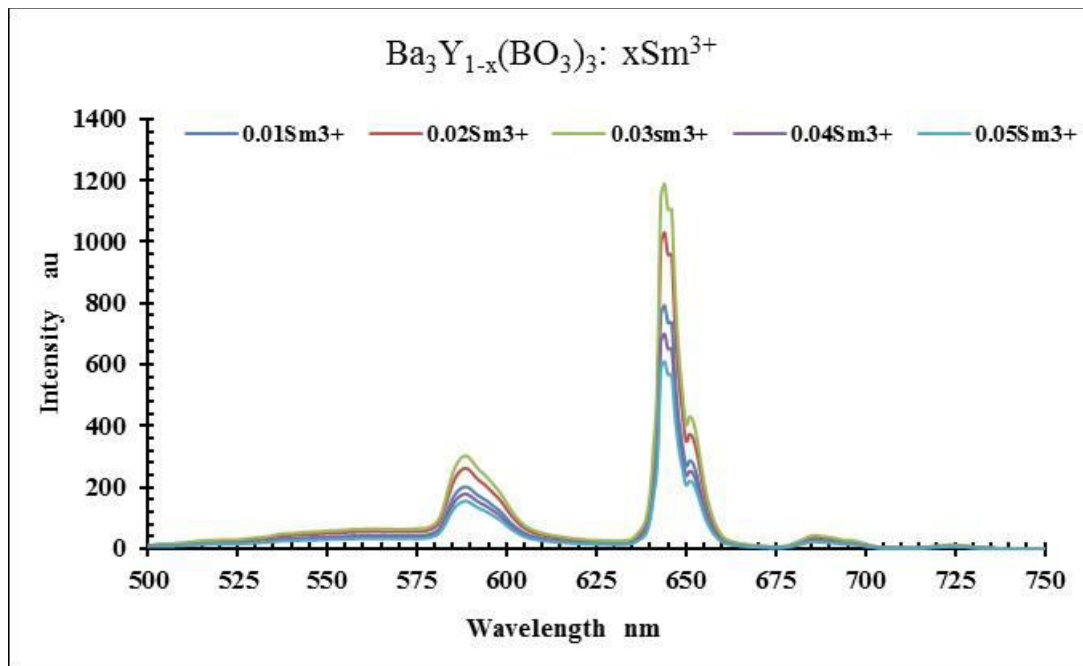


Figure 8. PL of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Sm}^{3+}$

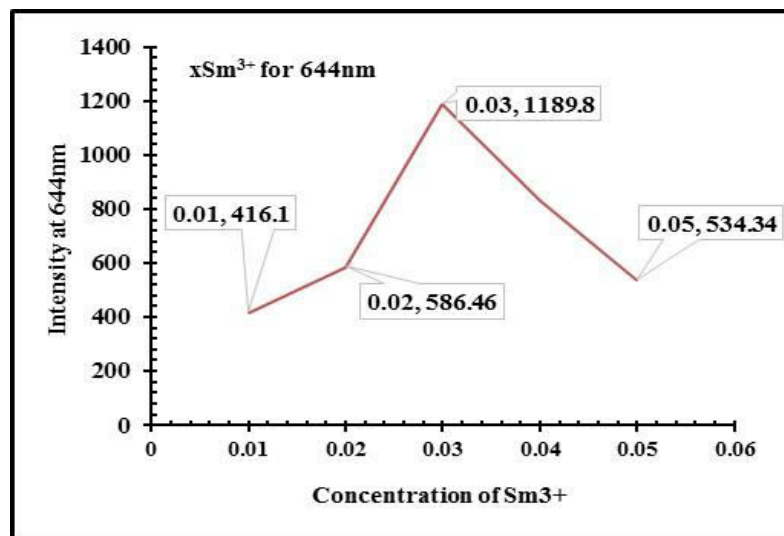


Figure 9. Variation in PL intensity with Sm ion concentration

Figure 10 and 11 represent the CIE chromaticity coordinates & color gamut diagram of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ phosphor. The “CIE coordinates” of the phosphor $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ for fixed concentration of Sm^{3+} at 449 nm and 388 nm excitation were computed. The “CIE coordinates for spectra” observed under 449 nm and 388 nm excitation were determined to be (0.722, 0.277) and (0.602, 0.396), respectively. The “CIE coordinates” under excitation at 449 nm fall in the deep-red region. These phosphor-compounds can be excited by NUV and blue light, so can be used to fabricate the LEDs.

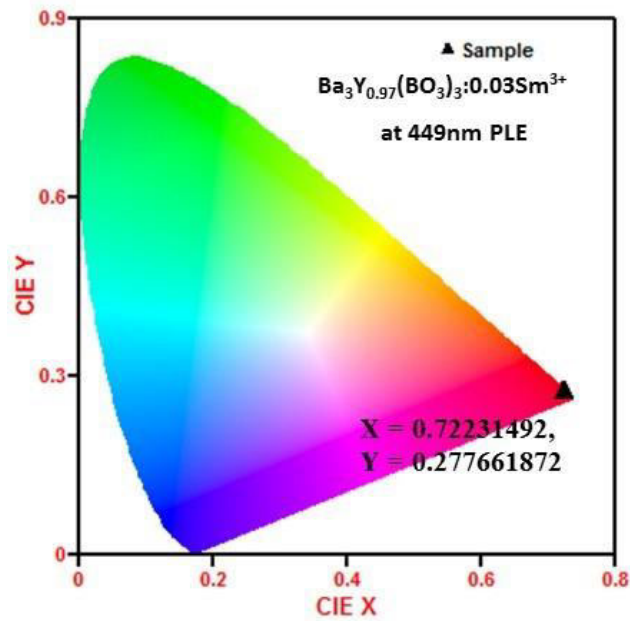


Figure 10. CIE diagram of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ excitation at 449 nm

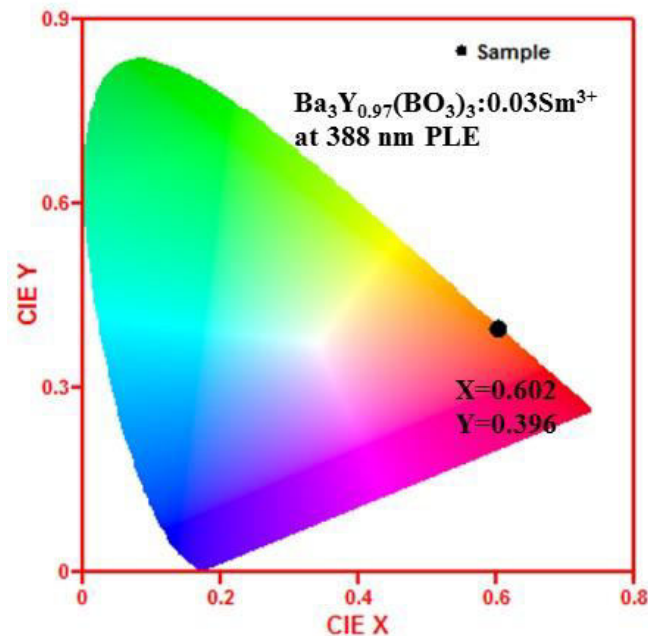


Figure 11. CIE diagram of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ excitation at 388 nm

4. Conclusions

$\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Sm}^{3+}$ phosphors were synthesized by modified solution combustion route. XRD pattern confirmed the $\alpha\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ structure of synthesized phosphors. The microstructures confirmed the formation of agglomerated particles with the average size in sub-micrometer range. It was observed that under excitation at 449 nm, PL spectrum consisted of highly intense peak at 644 nm, low-intensity peak at 589 nm, 651 nm and at 690 nm, while excitation at 388 nm, PL spectrum consisted of highly intense peak at 589 nm and low intensity line at 644 nm and 652 nm. Thus, by

changing the excitation wavelength, the color of emission changed from pure red to radish orange. It is color-tunable phosphor under photoluminescence excitation at two different wavelengths. In addition, the emission spectra of the prepared phosphors correspond to the absorption spectra of P_R phytochrome. The maximum Photoluminescence intensity was found for 3 mol% of Sm³⁺ ions. The CIE – chromaticity coordinates also fall in the red region. Also, the emission spectra of the presented phosphors correspond to the absorption spectra of P_R phytochrome. The emission of phosphors in the Red region under blue excitation makes them suitable candidates for ‘Red’ light-emitting diodes for “In-house plant applications”, “Indoor plant gardening”.

References

- [1] Kang, M., Wu, H., Yang, Q., Huang, L., Hu, Q., Ma, T., Li, Z. and Liu, J., 2020. A chromosome-scale genome assembly of *Isatis indigotica*, an important medicinal plant used in traditional Chinese medicine. *Horticulture research*, **7**(1) pp110.
- [2] Ditta, A. and Arshad, M., 2016. Applications and perspectives of using nanomaterials for sustainable plant nutrition. *Nanotechnol Rev* **5** 209–229.
- [3] Cupellini, L., Calvani, D., Jacquemin, D. and Mennucci, B., 2020. Charge transfer from the carotenoid can quench chlorophyll excitation in antenna complexes of plants. *Nature communications*, **11**(1) pp1-8.
- [4] Arsenault, E.A., Yoneda, Y., Iwai, M., Niyogi, K.K. and Fleming, G.R., 2020. Vibronic mixing enables ultrafast energy flow in light-harvesting complex II. *Nature communications*, **11**(1) pp1-8.
- [5] Xiang, J., Chen, J., Zhang, N., Yao, H. and Guo, C., 2018. Far red and near infrared double-wavelength emitting phosphor Gd₂ZnTiO₆: Mn⁴⁺, Yb³⁺ for plant cultivation LEDs. *Dyes and Pigments*, **154**pp257-262.
- [6] Ren, Y., Chen, T., Su, L., Cheng, X., Chen, T., Guo, S. and Yu, X., 2019. Photoluminescence properties of Ba₂LaSbO₆: Mn⁴⁺ deep-red-emitting phosphor for plant growth LEDs. *Journal of Luminescence*, **209**, pp1-7.
- [7] Zhang, Y., Huang, Y., Li, M., Liang, C., Zhu, H., Zhong, Y., Yang, N., Zhou, Z. and Xia, M., 2020. Tuning the luminescence properties of Mn⁴⁺-activated CaYAlO₄ phosphor by co-doping cations for indoor plant cultivation. *Journal of the American Ceramic Society*.
- [8] Shi, L., Wang, S., Han, Y.J., Ji, Z.X., Liu, L., Ma, D., Mu, Z.F., Mao, Z.Y., Wang, D.J., Zhang, Z.W. and Zhao, Y., 2020. Effects of Ti⁴⁺-and W⁶⁺-substitution on photoluminescence properties of Sr₂GdSbO₆: Mn⁴⁺ phosphor for plant cultivation. *Journal of Alloys and Compounds*, pp 154475.
- [9] Kong, Li, Yingying Liu, Langping Dong, Liang Zhang, Lu Qiao, Wensheng Wang, and Hongpeng You. 2020 "Enhanced red luminescence in CaAl₁₂O₁₉: Mn⁴⁺ via doping Ga³⁺ for plant growth lighting." *Dalton Transactions* 496 1947-1954.
- [10] Hu, J., Huang, T., Zhang, Y., Lu, B., Ye, H., Chen, B., Xia, H. and Ji, C., 2019. Enhanced deep-red emission from Mn⁴⁺/Mg²⁺ co-doped CaGdAlO₄ phosphors for plant cultivation. *Dalton Transactions*, **48**(7) pp455-2466.
- [11] Chen, J., Zhang, N., Guo, C., Pan, F., Zhou, X., Suo, H., Zhao, X. and Goldys, E.M., 2016. Site-dependent luminescence and thermal stability of Eu²⁺ doped fluorophosphate toward white LEDs for plant growth. *ACS applied materials & interfaces*, **8**(32) pp20856-20864.
- [12] Marikumar, R. and Vaidyanathan, S., 2020. Zero-concentration quenching: A Novel Eu³⁺ based red phosphor with Non-layered crystal structure for white LEDs and NaSrY (MoO₄)₃: Sm³⁺ based deep-red LEDs for plant growth. *Dalton Transactions*.
- [13] Khamaganova, T.N., 2006. Synthesis of indium alkali-earth double borates M₃In(BO₃)₃. *Russian journal of inorganic chemistry*, **51**(1) pp32-34.
- [14] Pan, S., Hu, Z., Lin, Z. and Wang, G., 2003. Growth and X-ray diffraction of Nd³⁺-doped Ba₃Y(BO₃)₃ crystal. *Journal of crystal growth*, **247**(3-4) pp452-456.
- [15] Maggay, I.V.B. and Liu, W.R., 2018. Novel red-emitting Ba₃Y(BO₃)₃: Bi³⁺, Eu³⁺ phosphors for N-UV white light-emitting diodes. *Journal of nanoscience and nanotechnology*, **18**(1), pp3-10.
- [16] Wu, X., Zheng, J., Ren, Q., Bai, W., Ren, Y. and Hai, O., 2019. Synthesis and luminescent properties of a novel orange-red Ba₃Y(BO₃)₃: Sm³⁺ phosphors for white LEDs. *Polyhedron*, **164**pp17-22.
- [17] Cheng, Z., Yu, J., Zhang, Y. and Zou, N., 2017. Luminescence and energy transfer mechanism of α-Ba₃Y(BO₃)₃: Ce³⁺, Tb³⁺. *Journal of Luminescence*, **192**pp1004-1009.
- [18] Patil, K.C., Aruna, S.T. and Ekambaram, S., 1997. Combustion synthesis Curr. Opin. Solid State Mater. Sci. **2** 158–165.

- [19] Hargunani, S.P., Palaspagar, R.S., Sonekar, R.P. and Omanwar, S.K., 2019, May. Photo-luminescence study of red borate phosphor $\text{Sr}_3\text{Y}_{1-x}(\text{BO}_3)_3:x\text{Eu}^{3+}$. In *AIP Conference Proceedings* (Vol. 2104, No. 1, p. 030027). AIP Publishing LLC.
- [20] Kumar, D., Sharma, M. and Pandey, O.P., 2015. Morphology controlled $\text{Y}_2\text{O}_3:\text{Eu}^{3+}$ nanophosphors with enhanced photoluminescence properties. *Journal of Luminescence*, **158** pp268-274.
- [21] Shi, L., Wang, S., Han, Y.J., Ji, Z.X., Ma, D., Mu, Z.F., Mao, Z.Y., Wang, D.J., Zhang, Z.W. and Liu, L., 2020. $\text{Sr}_2\text{LaSbO}_6:\text{Mn}^{4+}$ far-red phosphor for plant cultivation: Synthesis, luminescence properties and emission enhancement by Al^{3+} ions. *Journal of Luminescence*, **221** pp 117091.
- [22] Motloung, S.J., Lephoto, M.A., Tshabalala, K.G. and Ntwaeborwa, O.M., 2018. Combustion synthesis and characterization of $\text{MVO} \cdot 5\text{P}_2\text{O}_7$: Sm^{3+} , Tm^{3+} (M= Gd, La, Y). *Physica B: Condensed Matter*, **535** pp211-215.
- [23] Durairajan, A., Balaji, D., Rasu, K.K., Babu, S.M., Valente, M.A., Thangaraju, D. and Hayakawa, Y., 2016. Sol-gel synthesis and photoluminescence analysis of $\text{Sm}^{3+}:\text{NaGd}(\text{WO}_4)_2$ phosphors. *Journal of Luminescence*, **170** pp743-748.
- [24] Naktode, P.K., Shinde, K.N. and Kokode, N.S., 2016. Effective red-orange emitting $\text{CaMgPO}_4\text{Cl}:\text{Sm}^{3+}$ halophosphate phosphor. *Results in physics*, **6**pp.869-872.
- [25] Mahajan, R., Kumar, S., Prakash, R. and Kumar, V., 2018, August. Synthesis and luminescent properties of Sm^{3+} activated lithium zinc borate phosphor. In *AIP Conference Proceedings* (Vol. 2006, No. 1, p. 030045). AIP Publishing LLC.

PAPER • OPEN ACCESS

Wavelength down-conversion study of $\text{Ba}_3\text{Y}_{1-X}(\text{BO}_3)_3: x \text{Tb}^{3+} \& \text{Eu}^{3+}$ [$0.005 \leq X \leq 0.05$] phosphor for solid state lighting applications

To cite this article: S P Hargunani *et al* 2021 *J. Phys.: Conf. Ser.* **1913** 012021

View the [article online](#) for updates and enhancements.

You may also like

- [Efficient white light emitting diodes based on Cu-doped ZnInS/ZnS core/shell quantum dots](#)
Xi Yuan, Jie Hua, Ruosheng Zeng et al.
- [Measurement model of circadian action factor of phosphor-converted white LEDs based on photometric, electrical, and thermal properties](#)
Xuehua Shen, Huanting Chen, Min Xu et al.
- [Recent Advances and Challenges in Obtaining Stable CsPbX₃ \(X = Cl, Br, and I\) Nanocrystals Toward White Light-Emitting Applications](#)
G. Krishnamurthy Grandhi, Krishnaiah Mokurala, Joo Hyeong Han et al.

ECS
The
Electrochemical
Society
Advancing solid state &
electrochemical science & technology

DISCOVER
how sustainability
intersects with
electrochemistry & solid
state science research

Wavelength down-conversion study of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x \text{Tb}^{3+} \& \text{Eu}^{3+}$ [$0.005 \leq x \leq 0.05$] phosphor for solid state lighting applications

S P Hargunani*¹, R M Chavan¹, R P Sonekar¹ and N S Dhoble²

¹G.S. Science, Arts, Commerce College, khamgaonDist:- Buldhana M.S. India

²Department of Chemistry, Sevadal Mahila Mahavidhyalaya, Nagpur-4400099, Maharashtra, India

Email: *sphargunani.sh@gmail.com

Abstract. In this work, we synthesized the Tb^{3+} and Eu^{3+} doped $\alpha\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ phosphor using the solution combustion method. Using the powder XRD pattern and FTIR low-temperature phase of $\alpha\text{-Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Tb}^{3+} \& \text{Eu}^{3+}$ was confirmed. Element composition with percentage was verified by FE-SEM-EDS. Stoke's shift values were calculated which confirms the high thermal stability of the phosphor & its use in high power WLED. Photoluminescence study at room temperature was done. Intrinsic absorption due to the 4f-4f transition of Eu^{3+} results intense red emission from $\alpha\text{-Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Eu}^{3+}$ makes it suitable for pc-WLED and confirms the Centro-inversion symmetry site of Eu^{3+} in the host. Green emission at NUV excitation from $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Tb}^{3+}$ results from cross-relaxation of Tb^{3+} in a host. The concentration quenching reason for both activators was investigated by calculating and comparing critical distance. The purity of luminescence color was confirmed by plotting CIE-chromaticity co-ordinates on CIE-Color gamut. The entire work confirms the importance of synthesized phosphor along with previously reported same host materials. The reported phosphor may be suitable for NUV converted WLED, wavelength conversion devices, and high power RGB – WLED.

Keywords: Solution combustion, Borate Phosphors, Terbium, Europium, Photo-luminescence.

1. Introduction: Inorganic phosphors based WLED are widely used because of properties like energy efficiency, lifetime, stability, Cost-effective, design and ecofriendly nature. Inorganic luminescent materials have considerable importance in fluorescent lamps, solid-state lighting, phosphorescent paints, in road marking paints, high power LED etc. Wavelength conversion and color mixing are the most commonly used technology to produce white light [1-6]. So, the development of efficient phosphors for the wide possible applications is the favorite research area of material science. Abundant energy levels and the large number of possible transitions in the visible/UV light region makes the rare earths most common dopants in synthesis of borate phosphors [7]. Among Rare earth ion, Tb^{3+} is one of the most prospective green-emitting activators due to its 4f-4f transitions and Eu^{3+} is the promising red-emitting activator dopant [8].

The borate compound with formula $\text{M}_3\text{Ln}(\text{BO}_3)_3$ ($\text{M} = \text{Ba}, \text{Sr}, \text{and Ln} = \text{La-Lu}, \text{Y}, \text{Sc}$) were reported as promising phosphors for W-LED applications. The $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ crystal exists in two structures, i.e., low-temperature phase $\alpha\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ with space group $\text{P6}_3\text{cm}$ and high-temperature phase $\beta\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ with space group $\text{R}\bar{3}$. The photoluminescence properties under doping are different for both phases. The structure of $\alpha\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ is consist of 3-F-C boron atoms, 6-F-C yttrium atoms, 9 & 6-F-C barium atoms [9]. Irish Valerie et.al synthesized the $\text{Ba}_3\text{Y}(\text{BO}_3)_3: \text{Eu}^{3+}, \text{Bi}^{3+}$ phosphor via a solid-state reaction and studied it as a phosphor for w-LEDs using N-UV LED chips [10]. Xiulan Wu. *et.al.* described $\text{Ba}_3\text{Y}(\text{BO}_3)_3: \text{Sm}^{3+}$ as orange-red phosphor for WLEDs [11]. Jingjie Yu *et.al.* investigated luminescent and the



transfer of energy in α - $\text{Ba}_3\text{Y}(\text{BO}_3)_3:\text{Ce}^{3+}, \text{Tb}^{3+}$ [12]. Luminescent Research groups from all over the world are working for efficient phosphors for WLED had studied and proved the importance of borate host $\text{Ba}_3\text{Y}(\text{BO}_3)_3$. But synthesis of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ phosphor by solution combustion method is new approach. The luminescent properties of $\text{Eu}^{3+}\text{-Tb}^{3+}$ co-activated $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ prepared by solution combustion method is not described yet. $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ has been investigated for nonlinear optical applications and studied for w-LEDs applications by doping it with Eu^{3+} and Tb^{3+} . Photoluminescence (PL) properties, color chromaticity, Energy transfer mechanism for $\text{Eu}^{3+}, \text{Tb}^{3+}$ is also investigated.

2. Materials and methods: Powder samples of $\text{Ba}_3\text{Y}(\text{BO}_3)_3: x\text{RE}$ ($0 \leq x \leq 0.8$) ($\text{RE} = \text{Eu}^{3+}\text{-Tb}^{3+}$) were synthesized by a solution combustion method. The Exothermic reaction between nitrates and urea was used for the synthesis of the borate host luminescent materials. In the SCS, nitrate solution of A.R. grade [99.9% purity] precursors [$\text{Ba}(\text{NO}_3)_2, \text{Y}(\text{NO}_3)_3, \text{H}_3\text{BO}_3, \text{Eu}_2\text{O}_3, \text{Tb}_2(\text{SO}_4)_3$] in the stoichiometric amount was used as an oxidizer while NH_2CONH_2 is a fuel for combustion [13,14]. The boric acid is a neutral compound act as a source of boron. The chemical was combined with 10 ml of de-ionized water in a beaker and vigorously stirred for 20 min at a temperature of 90°C . The prepared paste was then kept in crucible and put in to a 680°C preheated furnace. The paste solution boiled and ignited within a few minutes to create a self-propagating flame, as shown in the figure 1. The entire combustion of solution with yellow-orange flame as shown in figure 1-A was completed in 4 to 5 minutes, but the crucible was left for the next few minutes in the furnace to ensure the completion of the decomposition. After removing crucible from the furnace, it cooled to room temperature. The prepared powder samples or foamy powder as shown in figure 1-Bis grinded into fine powders using pestle-mortar. The powders were post annealed at 950°C for 5 hours in a muffle furnace in air and in reducing environment using charcoal.

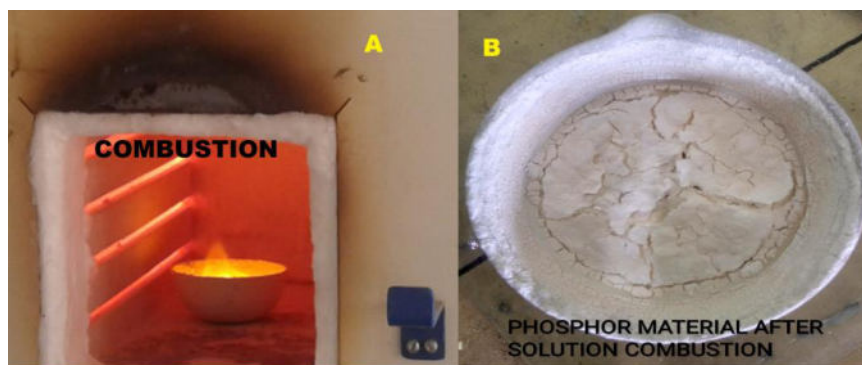


Figure 1. (A) Combustion in furnace (B) foamy powder after combustion

3. Results and discussion

3.1 XRD: On a R-M-II X-ray Diffractometer, powder X-ray spectra were taken and compared with available ICSD and JCPDS images. The synthesized phosphor powder XRD pattern was reported using the $\text{Cu-K}\alpha$ wavelength ($\lambda = 1.54060 \text{ \AA}$) and scanning from 20° - 80° . The powder XRD patterns of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ and $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{RE}$ [$\text{RE} = \text{Eu}^{3+}, \text{Tb}^{3+}$] phosphors are shown in figure 2. It is noted that all the diffraction peaks of $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{RE}$ powder phosphor matches with the standard JCPDS file no 51-1849 and ICSD file no 39744. As XRD patterns of different doped phosphors are same, we can draw the conclusion that prepared phosphors are single phase. The dopant $\text{Eu}^{3+}, \text{Tb}^{3+}$ ions don't distort

crystal structure of phosphor. $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ powder phosphor possesses hexagonal C-S with the S-G P63 cm (No.185). All B^{3+} are attached with three oxygen ions forming the BO_3^{3-} triangles. Y and Ba sites are separated by parallel planes constructed by BO_3^{3-} anion group. All Barium sites has the 9-co-ordination number. All Y^{3+} ions have the 6-co-ordination number. Crystal structure comprised of isolated BO_3 triangles; YO_6 octahedral and BaO_4 polyhedral. $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ possess layer structure of BO_3 triangles. Cell axes values are $a=b=9.419 \text{ \AA}$; $c=17.590 \text{ \AA}$; $V=1352.67 \text{ \AA}^3$ [15].

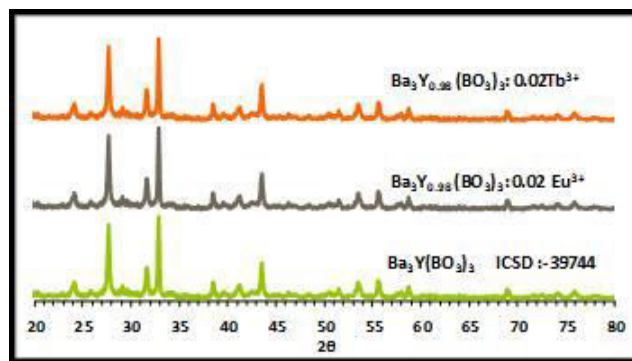


Figure 2. XRD and ICSD pattern of phosphors

3.2 FTIR: FTIR of sample was done on F.T. Infra-Red Spectrophotometer Model RZX (Perkin Elmer). The FT-IR spectra of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ and $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{RE}$ [RE= Eu^{3+} , Tb^{3+}] phosphors at NTP is given in Figure 3- A-B. The B-O stretching mode of the triangular $[\text{BO}_3]$ groups should be assigned to the peaks noted beyond 1050 cm^{-1} , while the bands with a limit of approximately 750 cm^{-1} are due to the B-O outside plane bending, confirming the presence of the $[\text{BO}_3]$. The lack of $1350\text{-}2500 \text{ cm}^{-1}$ peaks suggests the total removal of nitrate and organic matter. The absence of peak lines in $3200\text{-}3600 \text{ cm}^{-1}$ are due to unavailable O-H stretching mode. In the range of 650 cm^{-1} - 1600 cm^{-1} , FTIR shows some large bands. The 459 cm^{-1} , 544 cm^{-1} , 724 cm^{-1} bands represent the out of plane bending mode of the BO_3 group. The BO_3 groups inside plane movement are seen at 892 cm^{-1} , 939 cm^{-1} by the bands. The unsymmetrical straightenoscillation of the BO_3 unit is allocated to bands peaking at 1196 cm^{-1} , 1272 cm^{-1} and 1408 cm^{-1} .

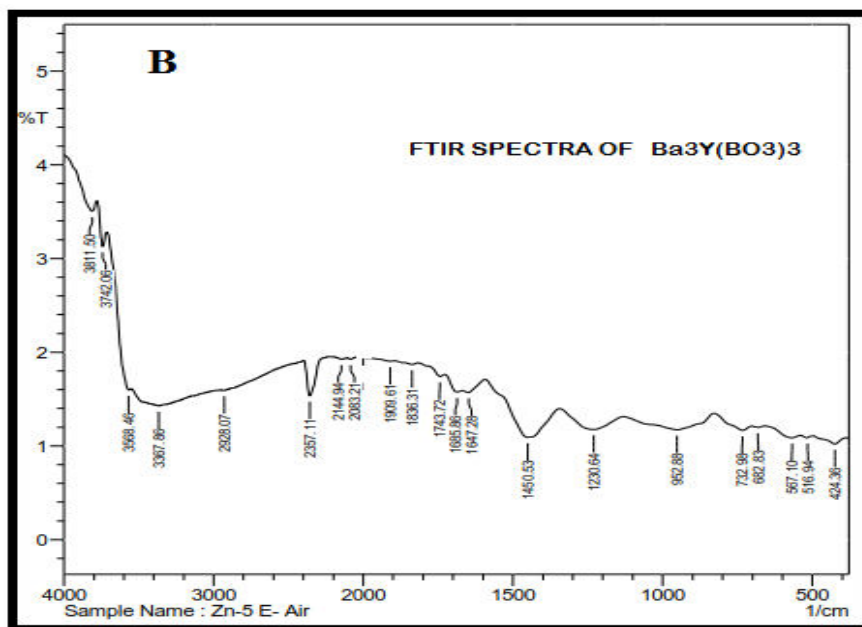
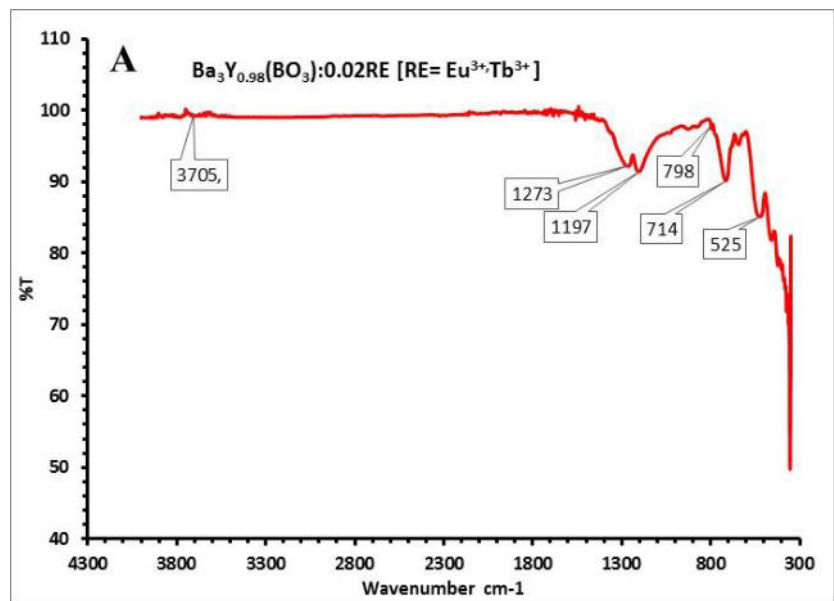


Figure 3. FTIR of (A) $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{Eu}^{3+}$ and (B) $\text{Ba}_3\text{Y}(\text{BO}_3)_3$

3.3 FE-SEM-EDS: For $Ba_3Y_{1-x}(BO_3)_3:xEu^{3+}$ calcined powder sample surface morphology and elemental composition analysis was performed. In Figure 4, the SEM micrographs of $Ba_3Y_{1-x}(BO_3)_3:xEu^{3+}$ phosphors are shown. The phosphor microstructure consists of irregular grains with phenomena of agglomerate. The synthesised phosphors particles have an average polycrystalline size of around 0.2-1 μm . SEM EDS graph confirms the presence of each element at proper concentration in as prepared phosphor material. FE-SEM photographs at different resolution are shown in inset of EDS graph given in figure 5. EDS elemental mappings show the presence of constituent elements Ba, Y, B, O, Eu, with a homogeneous distribution in the phosphor powders.

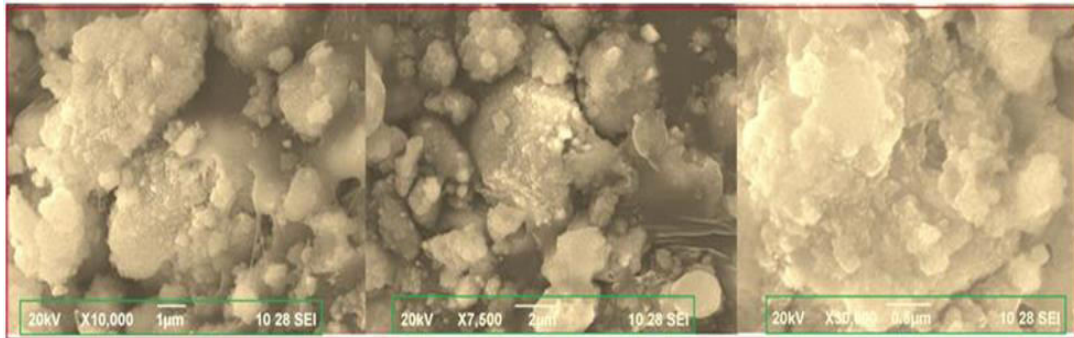


Figure 4. SEM micrographs of $Ba_3Y_{1-x}(BO_3)_3:xEu^{3+}$ phosphor

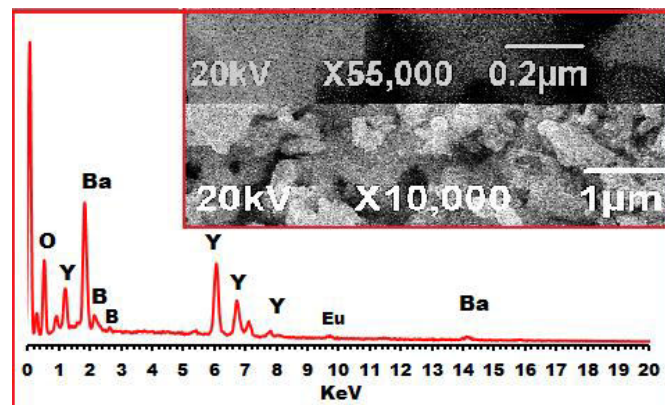


Figure 5. Element Mapping of SEM micrographs of $BYB: xEu^{3+}$ phosphor

3.4 Photo-Luminescence study

3.4.1 PL and PLE study of $Ba_3Y_{1-x}(BO_3)_3:xEu^{3+}$: Photoluminescence excitation (PLE) and emission spectra (PL) of $Ba_3Y_{0.98}(BO_3)_3:0.02Eu^{3+}$ material is given in figure 6. The spectrum is noted on F7000 FL Spectro-photometer under scan speed 240 nm/min, PLE-PL slit width 1nm. Broad absorption band ranging from 200nm to 400nm shows wide high intensity f-f shoulder peak at 350nm and low intensity CTB at 239nm. 350nm peak is due to the ${}^7F_0 \rightarrow {}^5D_4$ transition of Eu^{3+} in crystal. Emission spectrum monitored at 350nm consist of a series of sharp lines of wavelength 595nm [${}^5D_1 \rightarrow {}^7F_1$], 614nm [${}^5D_1 \rightarrow {}^7F_2$],

652nm [$^5D_1 \rightarrow ^7F_3$]. Stokes shift value at 350nm PLE and 614nm PL is $2340 \times 10^3 \text{cm}^{-1}$. To find optimal doping concentration of Eu^{3+} a series of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x \text{Eu}^{3+}$ [$x = 0.02, 0.03, 0.04, 0.05$] phosphor powder was synthesized and their PL emission spectra for 252nm excitation were recorded. Highest PL intensity was noted for 4 moles% of Eu^{3+} in phosphor.

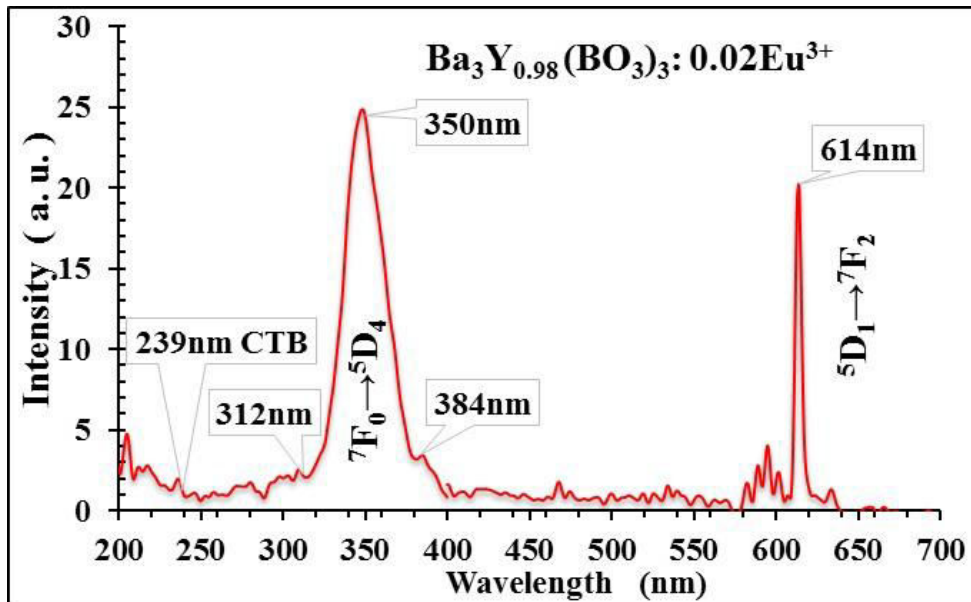


Figure 6. PL-PLE spectra of $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{Eu}^{3+}$ at room temperature

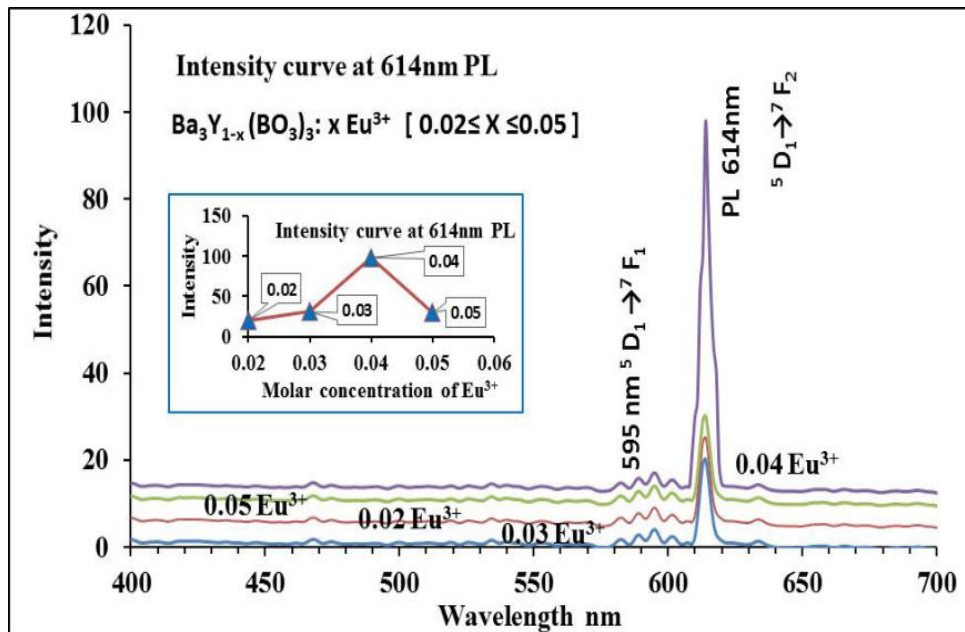


Figure 7. Concentration Quenching of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Eu}^{3+}$ [$0.02 \leq X \leq 0.05$]

3.4.2 PL and PLE study of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Tb}^{3+}$: -Photoluminescence excitation (PLE) and emission spectra (PL) of $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3: 0.02\text{Tb}^{3+}$ phosphor is shown in figure 8. The excitation spectrum consists of a broadband ranging from 200 to 390nm with maximum intensity at 354nm and low intensity peaks at 224nm, 327nm. The excitation peak at 354nm is due to ${}^7\text{F}_6 \rightarrow {}^5\text{D}_3$ transition of Tb^{3+} , low intensity peak at 224nm is due to ${}^7\text{F}_5 \rightarrow {}^5\text{D}_4$ and 327nm corresponding to ${}^7\text{F}_4 \rightarrow {}^5\text{D}_4$ transition of Tb^{3+} . Photoluminescence emission spectrum is recorded in the range 450nm to 700nm at 354nm excitation wavelength. Emission spectrum monitored at 354nm excitation consist of series of peaks i.e 486nm (${}^5\text{D}_4 \rightarrow {}^7\text{F}_6$), 544nm (${}^5\text{D}_4 \rightarrow {}^7\text{F}_5$), 552nm (${}^5\text{D}_4 \rightarrow {}^7\text{F}_4$), 584nm (${}^5\text{D}_4 \rightarrow {}^7\text{F}_3$) that is almost in green region of spectrum. Photoluminescence emission intensity is maximum for 544nm line. When photoluminescence excitation is recorded by monitoring emission line at 544nm we get excitation peak at 354nm. Stokes shift value at 354nm PLE and 544nm PL is $2225 \times 10^3 \text{cm}^{-1}$. In order to decide concentration quenching series of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Tb}^{3+}$ [$x=0.01, 0.02, 0.03, 0.04, 0.05$] powder phosphor prepared. PL for different concentrations of Tb^{3+} is recorded for the excitation of 354nm at room temperature and is shown in figure 9. Concentration quenching curve is shown inside the PL curve. Photoluminescence intensity for both important peaks 486nm and 544nm is maximum for 0.04 molar concentration of Tb^{3+} .

3.4.3 Concentration quenching: Beyond Critical concentration (4mole % for Eu^{3+} and Tb^{3+}) non radiative energy transfer takes place in dopant ions of phosphor. Critical distance $R_c [= (3V / 4\pi \chi_c N)^{1/3}]$ where 'V' is the volume of the unit cell, 'N' is the number of occupied sites in the unit cell, and ' χ_c ' is the critical concentration] for Eu^{3+} and Tb^{3+} is about 18 Å which is far greater than 5 Å indicates electric multipolar interaction as main reason of concentration quenching in phosphor material. Figure (10) shows quenching curve.

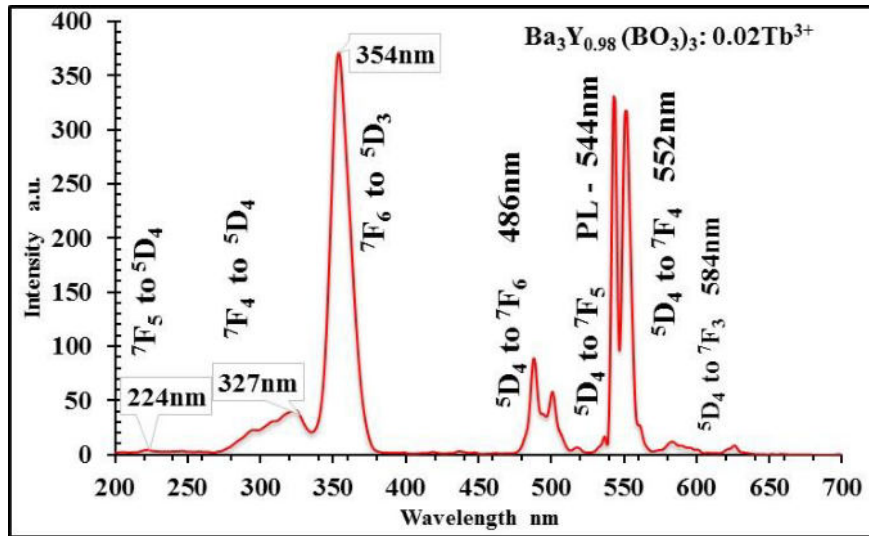


Figure 8. PLE-PL spectrum of $Ba_3Y_{0.98}(BO_3)_3: 0.02 Tb^{3+}$

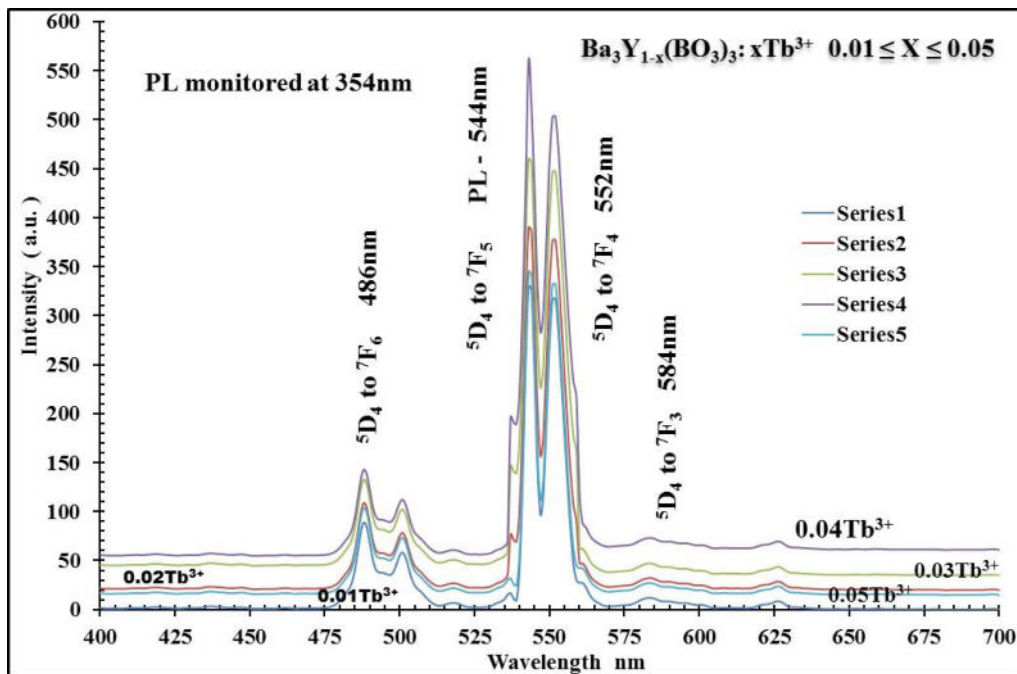


Figure 9. Photoluminescenceresults of $Ba_3Y_{1-x}(BO_3)_3: x Tb^{3+}$ monitored at 354nm.

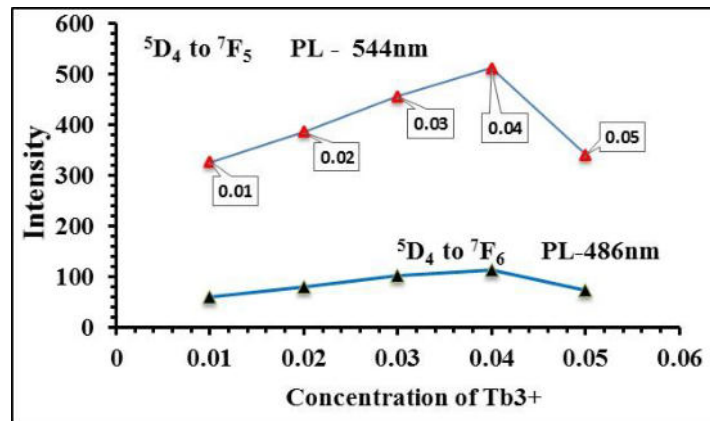


Figure 10. Concentration Quenching of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3:x\text{Tb}^{3+}$ at 544nm & 486nm

3.5 1931-CIE-chromaticity: The CIE-diagram provides the quantitative connections in the visible electromagnetic spectrum between pure physical colours and perceived physiological colours in human colour vision. Using LED-TUNING-NL Software [<https://www.ledtuning.nl/en/cie-converter/>], chromaticity coordinates are computed. The coordinates of chromaticity are utilized in the 'GO-CIE' CIE plot utility programme designed by the IIT Roorkee 'OrganicMaterial Laboratory'. [<http://professorship.iitr.ac.in/~krjt8fcy/gocie.html>]. CIE Chromaticity co-ordinates for $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{Eu}^{3+}$ at PL wavelength 614nm are $X = 0.6774$, $Y = 0.3223$. It comes in red region of CIE Chromaticity diagram and is indicated by black triangle in figure 12. For $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{Tb}^{3+}$ at 544nm PL line chromaticity co-ordinates are $X = 0.2585$, $Y = 0.7305$. It is in green region of spectrum and is indicated by black triangle in figure 12. CIE- coordinates of synthesized phosphors lie on Wide Gamut RGB. For UV excitation light we got green and red luminescence as shown in figure 11.

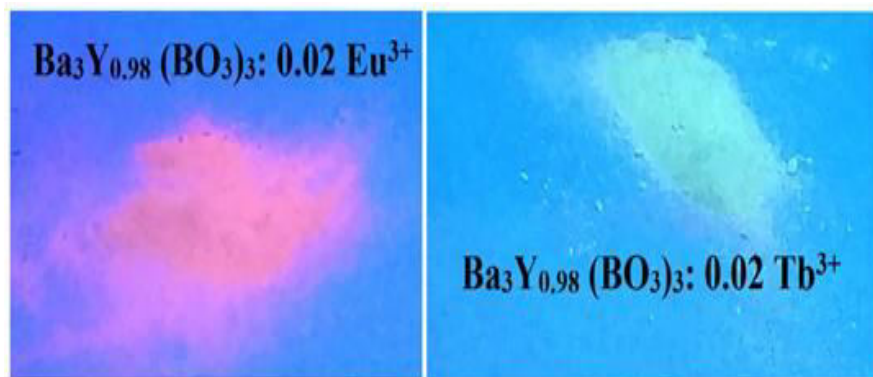


Figure 11 Luminescence photographs of $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{Eu}^{3+}$ and 0.02Tb^{3+}

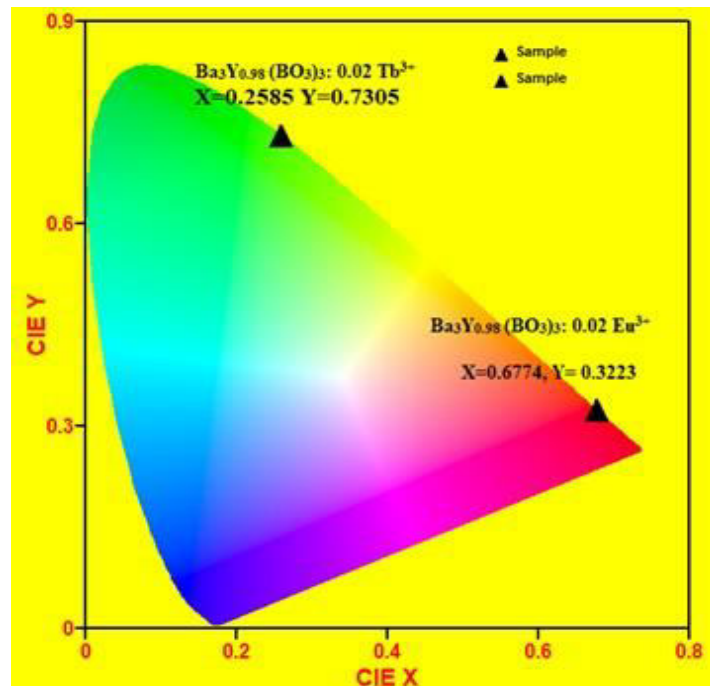


Figure 12 CIE-Chromaticity diagram of $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3: 0.02 \text{Eu}^{3+}$ and 0.02Tb^{3+}

The color quality of light in terms of ‘color correlated temperature (CCT)’ is given by the McCamy empirical formula [16].

$$\text{‘CCT} = -437n_3 + 3601n_2 - 6861n + 5514.31\text{’}$$

Where n is the ‘Inverse slope line’ having value, $n = (X - X_e) / (Y - Y_e)$. Here ‘ (X, Y) ’ are CIE-co-ordinates and ‘ $(X_e=0.332, Y_e=0.186)$ ’ co-ordinates for epicenter. Lamps with CCT value below 3200K are considered as Warmth sources and having value more than 4000K are considered Cool sources of light in appearance. For $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{Eu}^{3+}$ phosphor CCT value is 4148 and for $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{Tb}^{3+}$ CCT value is 6515.

4. Conclusions: Using Solution combustion method synthesis of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ polycrystalline phosphor is achieved. XRD pattern matches with the standard JCPDS file no 51-1849 and ICSD file no 39744. “ $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x \text{Eu}^{3+}$ ” is NUV excited “Red emitting phosphor”. $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Eu}^{3+}$ phosphor shows prominent luminescence for 614nm ascribed to electric dipole transition of $^5\text{D}_1 \rightarrow ^7\text{F}_2$. It happens only when Eu^{3+} occupy symmetry site in host crystal. Intrinsic absorption due to 4f-4f transitions is strong compared to CTB absorption at 234nm. $\alpha\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ host crystal partially allowed parity forbidden 4f-4f transition in Eu^{3+} ion having centro symmetric site occupancy. Due to Broad excitation band (312nm to 384nm) the material is useful in NUV excitation-based lighting applications. 1931-CIE- chromaticity co-ordinates for 614nm maximum emission line are $X = 0.6774, Y = 0.3223$.

$\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Tb}^{3+}$ is NUV excited green emitting phosphor. Photoluminescence excitation spectrum is broadband from 220 to 390nm with maximum intensity at 356nm (${}^7\text{F}_6 \rightarrow {}^5\text{D}_3: \text{Tb}^{3+}$). Luminescence is noted in almost green region with high intensity at 544nm (${}^5\text{D}_4 \rightarrow {}^7\text{F}_5$). 1931-CIE- chromaticity coordinates for 544nm high intensity emission line are $X=0.2585$, $Y=0.7305$. For both dopants Eu^{3+} , Tb^{3+} concentration quenching occurs at 4mole% resulting from electric multipolar interaction. Stokes's shift of $2340 \times 10^3 \text{cm}^{-1}$, $2225 \times 10^3 \text{cm}^{-1}$ shows that $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3: 0.02\text{Eu}^{3+} \& \text{Tb}^{3+}$ phosphor produce less electron-phonon interaction and possess greater thermal stability. So, it may be the promising material for high power RGB-white light emitting diodes. $\text{Ba}_3\text{Y}(\text{BO}_3)_3: x\text{Eu}^{3+}$ and $x\text{Tb}^{3+}$ are quantum cutting phosphor at low temperature phase. We also suggest this material for white light emitting diodes base on color mixing.

5. References:

- [1] Chen, Lei; Lin, Chun-Che; Yeh, Chiao-Wen; Liu, Ru-Shi. 2010. "Light Converting Inorganic Phosphors for White Light-Emitting Diodes." *Materials* 3, 3: 2172-2195.
- [2] Xia, Zhiguo, Zihan Xu, Mingyue Chen, and Quanlin Liu. 2016 "Recent developments in the new inorganic solid-state LED phosphors." *Dalton transactions* 45, 28: 11214-11232.
- [3] Huang, Xiaoyong. 2014 "Red phosphor converts white LEDs." *Nature Photonics* 8, 10: 748-749.
- [4] Tsao, Jeff Y. 2004 "Solid-state lighting: lamps, chips, and materials for tomorrow." *IEEE Circuits and Devices Magazine* 20, 3: 28-37.
- [5] Dutta, Dimple P., and A. K. Tyagi. 2009 "Inorganic phosphor materials for solid state white light generation." *In Solid State Phenomena Trans Tech Publications Ltd*, 155, pp. 113-143.
- [6] Ye, S., F. Xiao, Y. X. Pan, Y. Y. Ma, and Q. Y. Zhang. 2010 "Phosphors in phosphor-converted white light-emitting diodes: Recent advances in materials, techniques and properties." *Materials Science and Engineering: R: Reports* 71, 1: 1-34.
- [7] Yuhua, W. A. N. G., Z. H. U. Ge, X. I. N. Shuangyu, W. A. N. G. Qian, L. I. Yanyan, W. U. Quansheng, W. A. N. G. Chuang, W. A. N. G. Xicheng, D. I. N. G. Xin, and G. E. N. G. Wanying. 2015 "Recent development in rare earth doped phosphors for white light emitting diodes." *Journal of Rare Earths* 33, 1: 1-12.
- [8] Basavaraj, R. B., H. Nagabushana, G. P. Darshan, B. Daruka Prasad, M. Rahul, S. C. Sharma, R. Sudaramani, and K. V. Archana. 2017. "Red and green emitting CTAB assisted $\text{CdSiO}_3: \text{Tb}^{3+}/\text{Eu}^{3+}$ Nano powders as fluorescent labeling agents used in forensic and display applications." *Dyes and Pigments* 147: 364-377.
- [9] Wang, De-Yin, Teng-Ming Chen, and Bing-Ming Cheng. 2012 "Host sensitization of Tb^{3+} ions in tribarium lanthanide borates $\text{Ba}_3\text{Ln}(\text{BO}_3)_3$ (Ln=Lu and Gd)." *Inorganic chemistry* 51, 5: 2961-2965.
- [10] Maggay, Irish Valerie B., and Wei-Ren Liu. 2018 "Novel red-emitting $\text{Ba}_3\text{Y}(\text{BO}_3)_3: \text{Bi}^{3+}, \text{Eu}^{3+}$ phosphors for N-UV white light-emitting diodes." *Journal of nanoscience and nanotechnology* 18, 1: 3-10.
- [11] Wu, Xiulan, Jinle Zheng, Qiang Ren, Wenni Bai, Yuhan Ren, and Ou Hai. 2019 "Synthesis and luminescent properties of a novel orange-red $\text{Ba}_3\text{Y}(\text{BO}_3)_3: \text{Sm}^{3+}$ phosphors for white LEDs." *Polyhedron* 164: 17-22.
- [12] Cheng, Zhiyuan, Jingjie Yu, Yanjie Zhang, and Nianyu Zou. 2017 "Luminescence and energy transfer mechanism of $\alpha\text{-Ba}_3\text{Y}(\text{BO}_3)_3: \text{Ce}^{3+}, \text{Tb}^{3+}$." *Journal of Luminescence* 192: 1004-1009.
- [13] Mimani, T., and K. C. Patil. 2001 "Solution combustion synthesis of nanoscale oxides and their composites." *Materials Physics and Mechanics (Russia)* 4, 2: 134-137.
- [14] Bajaj, N. S., and S. K. Omanwar. 2012 "Combustion synthesis and luminescence characteristic of rare earth activated LiCaBO_3 ." *Journal of Rare Earths* 30, 10: 1005-1008.
- [15] Qiao, Xuebin, and Hyo Jin Seo. 2015 "Phase transition, structural and spectroscopic properties of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ phosphor." *Journal of Alloys and Compounds* 637: 504-508.
- [16] Kasturi, Singh, R. Marikumar, and Sivakumar Vaidyanathan. 2018 "Trivalent rare-earth activated hexagonal lanthanum fluoride ($\text{LaF}_3: \text{RE}^{3+}$, where RE= Tb, Sm, Dy and Tm) nanocrystals: Synthesis and optical properties." *Luminescence* 33, 5: 897-906.

6. Acknowledgements: This work was supported by Physics Department, S.G.B.A.U. Amravati. We are Thankful to Head, Department of Physics S.G.B.A.U. for providing PLE-PL and XRD facility.

Photo-Luminescence study of $\text{Ba}_3\text{Gd}_{1-x}(\text{BO}_3)_3 : X \text{Ce}^{3+}$ phosphor

S. P. Hargunani¹, R. P. Sonekar¹, V. R. Panse², Marta Michalska-Domanskais³, N. S. Bajaj⁴

¹Department of Physics, G. S. College khamgaon, Dist: Buldana (M.S.), INDIA.

²Department of Physics, Late B.S.Arts Prof.N.G.Sci & A.G.Comm College Sakharkherda, India-443202

³ Institute of Optoelectronics, Military University of Technology, Poland.

⁴Department of Physics, Toshniwal Arts, Commerce & Science College

²Corresponding author's e-mail address: vshl.panse@gmail.com

Abstract

The polycrystalline powder sample of Ce^{3+} activated barium gadolinium borate phosphors $\text{Ba}_3\text{Gd}_{1-x}(\text{BO}_3)_3 : X \text{Ce}^{3+}$ ($0.01 \leq X \leq 0.06$) are prepared by solution combustion. Formation of phosphor in desired crystalline phase confirmed by powder XRD characterization & FTIR. A SEM image shows the irregular grains with average particle size $2.5\mu\text{m}$. The excitation spectrum consists of a single broad absorption band from 200 to 400 nm with the prominent excitation peak at 343 nm [$^2\text{F}_{5/2}$ to $^5\text{D}_1$ of Ce^{3+} ions]. Strongest emission peak of 488nm [$^5\text{D}_1 \rightarrow ^2\text{F}_{5/2}$] and weak of 501nm [$^5\text{D}_1 \rightarrow ^2\text{F}_{7/2}$] wavelength which is of blue light is observed at 343nm UV light excitation. $\text{Ba}_3\text{Gd}_{1-x}(\text{BO}_3)_3 : X \text{Ce}^{3+}$ phosphor emits blue light under UV excitation. Maximum PL emission takes place at 3 mole percentage of Ce^{3+} . Concentration quenching for Ce^{3+} ions is studied. Hence $\text{Ba}_3\text{Gd}_{1-x}(\text{BO}_3)_3 : X \text{Ce}^{3+}$ is new UV excited blue emitting phosphor useful for UV/Blue chip WLEDs.

Keywords

Borate phosphor, Photoluminescence, Red emission, W- LED.

1. Introduction

The syntheses of compounds $\text{M}_3\text{Ln}(\text{BO}_3)_3$ M =Sr, Ba and Ln=La–Lu, Sc, Y have been reported in recent past years [1]. The spectroscopic properties of vacuum ultraviolet and x-ray excited Ce^{3+} ion-activated $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ have been reported by Hong-bin Liang et.al. They studied luminescence properties of Ce^{3+} -doped barium gadolinium borate $\text{Ba}_3\text{Gd}(\text{BO}_3)_3:\text{Ce}^{3+}$ under vuv, uv, and x-ray excitations. $\text{Ba}_3\text{Gd}(\text{BO}_3)_3:\text{Ce}^{3+}$ is a poor x-ray phosphor. The dopant Ce^{3+} is slightly larger than Gd^{3+} but it will not distort the crystal lattice of $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ too seriously and is expected to replace Gd^{3+} ions [2]. $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ doped with Eu^{3+} ion was prepared by high temperature solid-state method and luminescence was studied by ZHOU Liya et.al. $\text{Ba}_3\text{Gd}(\text{BO}_3)_3:\text{Eu}^{3+}$ phosphor was effectively excited by the near ultraviolet (UV) light (396 nm) and blue light (466 nm). The main

emission peaks are at 611 and 616 nm , it was red emitting phosphor [3]. Cerium trivalent ion has only one 4f electron and only single discrete 4f energy level shielded by the completely filled 5S², 5P⁶orbital. General emission of Ce³⁺ has doublet character with wavelength difference approximately 40nm. Broad emission band is due to inter-configurationally 5d¹-4f¹ allowed transition of Ce³⁺. For blue luminescence Ce³⁺ ions is worthy to use in phosphors. For the important point of application, each proper mono-color-blue LED phosphor must meet the following necessary conditions. (1) The phosphor must show higher thermal stability. (2) The phosphor must efficiently absorb the 340nm - 400nm excitation energy. (3) The CIE coordinates of the phosphor are close to the NTSC standard values. BaMgAl₁₀O₁₇:Eu²⁺ (BAM) is one kind of reported commercial blue phosphor used in fluorescent lamps, because of its efficient blue emission [11]. Ca₂B₅O₉Cl:Eu²⁺, is another suitable Blue-Emitting Phosphor for n-UV Excited Solid-State Lighting [12]. Ca₂Pb₃(PO₄)₃Cl : Ce³⁺ is recently reported blue emitting lamp phosphor [13]. Sr_{1-x}Ca_xLu₂O₄:Ce³⁺ is blue phosphor for high CRI white LEDs [14-15].

2. Experimental

Phosphors were prepared by the solution combustion synthesis [4,5]. Stoichiometric amounts of high purity starting materials, Ba(NO₃)₂ (A.R.), H₃BO₃ (A.R.), CO(NH₂)₂ (A.R.), Gd(NO₃)₃.6H₂O (A.R.), Ce(NO₃)₃.6H₂O as given in table (1) are used for phosphor preparation. All chemicals from Merck of AR grade of (99.99%) purity. The starting materials with little amount of double distilled water were mixed thoroughly in agate mortar to obtain a homogeneous solution. Excess water was removed by heating the samples at temperature 100°C for about 30 min and the paste was then transferred directly to a pre-heated Muffle furnace, maintained at temperature 680°C, for combustion. Following the combustion, the resulting foamy samples was crushed to obtain fine particles and then annealed for 3 h at temperature 950°C. As prepared Borate phosphor material was characterized by powder XRD, SEM, PL and FT-IR techniques. Surface morphology and elemental analysis of the calcined powder sample was observed by scanning electron microscopy [SEM:Model JSM6100 (Jeol)].

Table 1 Merck -AR grade chemicals used for synthesis

Ba₃Gd_{0.97}(BO₃)₃ : 0.03 Ce³⁺					
Precursors	Ba(NO₃)₂	Gd(NO₃)₂	H₃BO₃	NH₂CONH₂	Ce(NO₃)₃.6H₂O
Molar ratio	3	0.96	3	7.45	0.04
Weight in gm	7.8405	1.08388	1.853	4.4744	0.194028

3. Results and Discussion

3.1. X-ray diffraction

Powder X-ray diffraction measurements of $\text{Ba}_3\text{Gd}_{0.970}0.03\text{Ce}^{3+}(\text{BO}_3)_3$ phosphor were taken on a Rigaku Miniflex II X-ray Diffractometer and compared with JCPDS No.(52-1327) as shown in figure 1-A. The maximum peaks matches with the standard pattern. The additional peaks are present in recorded pattern are due to impurities. Sharp peaks in XRD pattern are due to large crystallite size. X-ray pattern of $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ matches with the X-ray pattern of low temperature phase of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ [1,2]. Space group of phosphor $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ is $R\bar{3}(148)$ and cell parameters are $a = 13.06$, $c = 9.552$. $V = 1412.42 \text{ \AA}^3$. A detailed structure description of $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ was not found in literature. Bing Han *et al.* in his work mentioned that $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ is isomorphic with $H\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ for the following three reasons: (i) The powder XRD patterns of $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ and $H\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ are similar. (ii) The ionic radii of Gd^{3+} [$R_{\text{Gd(III)}}$] = 93.8 pm are close to that of Y^{3+} [$R_{\text{Y(III)}}$] = 90.0 pm in six fold coordination. (iii) It was found that the unit cell parameters [$a = 13.067(3) \text{ \AA}$, $c = 9.552(3) \text{ \AA}$, trigonal, $R\bar{3}$] of $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ are similar with that [$a = 13.028(2) \text{ \AA}$, $c = 9.4992(2) \text{ \AA}$, trigonal, $R\bar{3}$] of $H\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ [2]. In a high temperature phase, a $H\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ with a trigonal system having a space group of $R(3)$, $Z = 6$, which consists of YB_6O_{18} unit with polyhedral of BaO_6 and BaO_8 as shown in figure 1-B [16].

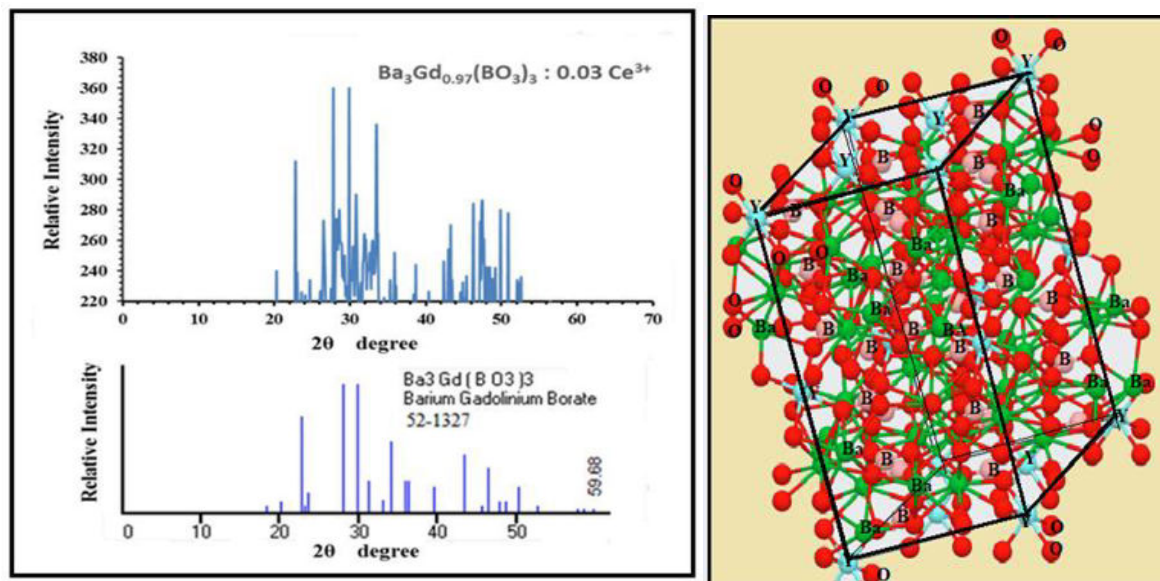


Figure 1-A:XRD-pattern of sample1-B:Structural unit of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ with six fold coordination of Y^{3+} ions [17]

3.2. SEM

SEM study was carried out to examine the surface morphology of the prepared phosphor. The SEM images of $\text{Ba}_3\text{Gd}_{1-0.03}(\text{BO}_3)_3:0.03\text{Ce}^{3+}$ phosphors are shown in Figure 2. It was

observed that the microstructure of the phosphor consist of irregular grains with agglomerate phenomena. The average size of synthesized phosphor particles is about 50 μm . The results show that phosphors have a good crystallinity and a relatively low sinter temperature. Average crystalline size by Scherrer formula is in 42.2 nm, which is nearly same as seen in surface morphology. SEM shows the image of polycrystalline particles and XRD measurements reflect the crystalline domain size. It indicates that solution combustion synthesized phosphor has sharp surface morphology as well as crystalline grains.

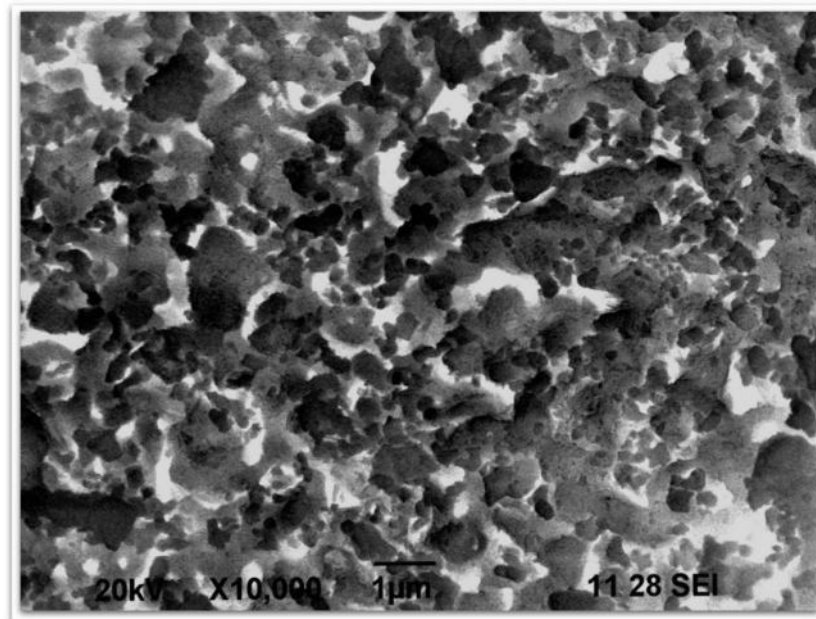


Figure 2: SEM Image of phosphor host.

3.3. PL and PLE Study

The PLE of $\text{Ba}_3\text{Gd}_{0.97}(\text{BO}_3)_3 : 0.03\text{Ce}^{3+}$ phosphor is shown in figure (3). It is recorded on F-7000 FL spectrophotometer with scan speed 240 nm/min, excitation-emission slit width 1nm. Ce^{3+} is all-round candidate for phosphor materials and it does not have any 4f-4f transition. It shows only 4f-5d type inter configurationally transition in borate host [8,9,10]. Photoluminescence excitation is broad band in region 240nm to 400nm with shoulder peak at 343nm due to transition from $^2\text{F}_{5/2}$ to $^5\text{d}_1$ level of activator ion in host lattice.

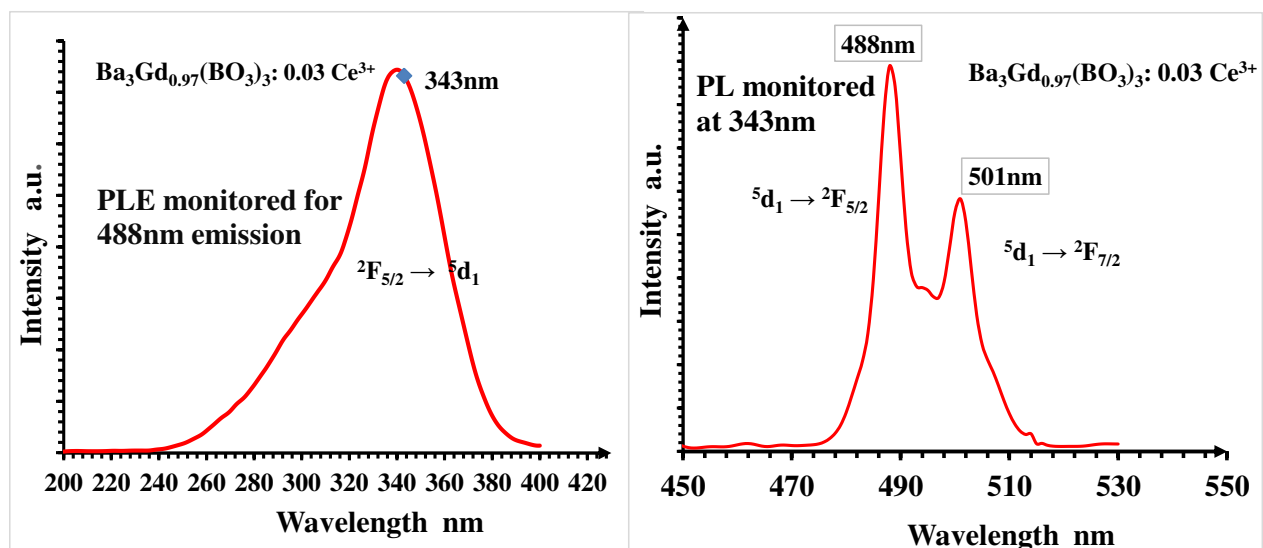


Figure 3 PLE of $Ba_3Gd_{0.97}(BO_3)_3 : 0.03 Ce^{3+}$ **Figure 4** PL of $Ba_3Gd_{0.97}(BO_3)_3 : 0.03 Ce^{3+}$

The PL of $Ba_3Gd_{0.97}(BO_3)_3 : 0.03 Ce^{3+}$ phosphor monitored at 343nm excitation is shown in figure (4). PL recorded in range 450nm to 530nm shows two peaks at 488nm and 501nm. 488nm peak is due to 5d_1 to $^2F_{5/2}$ and 501nm peak is due to 5d_1 to $^2F_{7/2}$ transition of activator in crystal environment. Ce^{3+} ion shown the two characteristic lines. Intensity of 501nm is less than 488nm line. 488nm lies in blue region of spectrum. So it is NUV excited blue emitting phosphor. The photoluminescence study is carried out at room temperature.

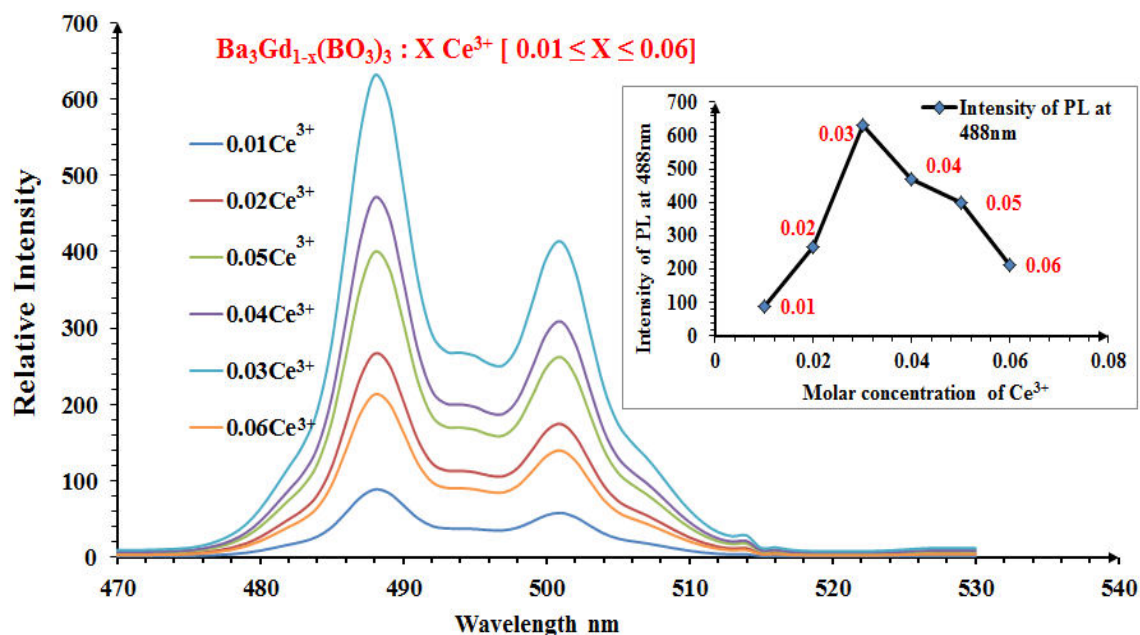


Figure 5 PL of host phosphor at different concentration of dopant Ce^{3+} And embedded Concentration quenching Curve

3.4. CIE Chromaticity Diagram of $Ba_3Gd_{0.97}(BO_3)_3 : 0.03 Ce^{3+}$

Figure (6) shows the Commission International del Eclairage (CIE) chromaticity coordinates diagram of the $Ba_3Gd_{0.97}(BO_3)_3 : 0.03 Ce^{3+}$ phosphor at 488nm. The chromaticity coordinates of the phosphor $Ba_3Gd_{0.97}(BO_3)_3 : 0.03Ce^{3+}$ for fixed concentration of Ce^{3+} at 488 nm was computed using LEDTUNING. NL Software [<https://www.ledtuning.nl/en/cie-convertoor>][11-12-13]. CIE Chromaticity co-ordinates for $Ba_3Gd_{0.97}(BO_3)_3 : 0.03Ce^{3+}$ at PL wavelength 488nm are $X = 0.05467$, $Y = 0.2541$. It comes in blue region of CIE Chromaticity diagram and is indicated by black circle in figure(6). CCT value is 122321 kelvin and Delta uv is 0.1402.

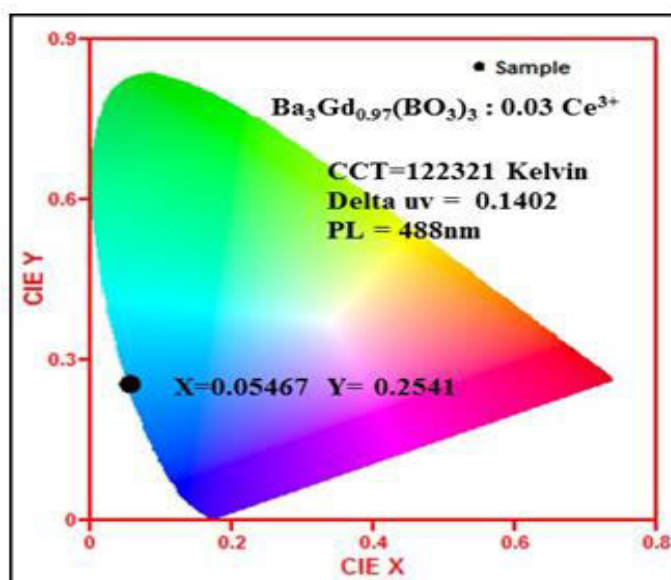


Figure 6 CIE chromaticity of $Ba_3Gd_{0.97}(BO_3)_3 : 0.03 Ce^{3+}$

4. Conclusions

The $Ba_3Gd_{1-x}(BO_3)_3 : X Ce^{3+}$ polycrystalline phosphor was synthesized by solution combustion method. XRD confirmed the phase & formation of compound and it matches with standard JCPDS file number 52-1327. SEM shows the average size of synthesized phosphor particles was about 2.5 μm and good crystalline. Phosphor shows broad excitation band from 200 to 400 nm with prominent peak at 343 nm. PLE for characteristic emission wavelength 488 nm was found to be 343 nm. At 343 nm, UV light excitation $Ba_3Gd_{1-x}(BO_3)_3 : X Ce^{3+}$ phosphor emits blue light.

Acknowledgements

Author S.P.Hargunani is thankful to the Chairman of FIST-DST project SGB Amravati University Amravati, for providing XRD facility to this work and also thankful to Dr. R.P. Sonekar, Head Physics Dept., Dr. D S Talwankar, Head research center, G.S. Science, Arts and Commerce College Khamgaon, for providing synthesis facility.

References

1. Wang, De-Yin, Teng-Ming Chen, and Bing-Ming Cheng. *Inorganic chemistry* 51, no. 5 (2012): 2961-2965.
2. Han, Bing, Hong-bin Liang, Hui-hong Lin, Jiu-ping Zhong, Qiang Su, Pieter Dorenbos, M. DanangBirowosuto, Guo-bin Zhang, and Yi-bing Fu. *Journal of applied physics* 101, no. 11 (2007): 113530.
3. Liya, Zhou, Junli Huang, Yi Linghong, Gong Menglian, and Shi Jianxin. *Journal of Rare Earths* 27, no. 1 (2009): 54-57.
4. Simura, Rayko, TatsushiYagi, Kazumasa Sugiyama, Takayuki Yanagida, and Akira Yoshikawa. "*Journal of crystal growth* 362 (2013): 145-148.
5. Pan, Shangke, Jianyu Zhang, and Jianguo Pan. *Optical Materials* 76 (2018): 178-183.
6. Palaspar, R. S., R. P. Sonekar, and S. K. Omanwar. *AIP Conference Proceedings*, vol. 1536, no. 1, pp. 807-808. American Institute of Physics, 2013.
7. Hargunani, S. P., R. P. Sonekar, HarmanpreetKaur, J. G. Mahakhode, and Samikha B. Dhoble. "Combustion synthesis of Ba₃Y_{1-x}Sm₃₊ x (BO₃)₃ as red-light emitting phosphors for indoor plant cultivation applications." In *Journal of Physics: Conference Series*, vol. 1913, no. 1, p. 012016. IOP Publishing, 2021..
8. Hargunani, Sanjay P., Rajkumar P. Sonekar, Ritesh S. Palaspar, PranitaPatil, and Shriniwas K. Omanwar. *Macromolecular Symposia*, vol. 387, no. 1, p. 1800184. 2019.
9. X. Zhang and M. Gong, *Industrial & Engineering Chemistry Research ACS*, vol. 54, p. 7632-7639, 2015.
10. JiayueSuna, YiningSuna, J. Lai, Z. Xiab and HaiyanDua, *Journal of Luminescence*, vol. 132, no. 11, pp. 3048-3052, November 2012,.
11. Wang, Z. L., KokWaiCheah, Hoi Lam Tam, and M. L. Gong. *Journal of Alloys and Compounds* 482, no. 1-2 (2009): 437-439.
12. Zhang, Xinmin, Hong Chen, Weijia Ding, Hao Wu, and Jongsu Kim. *Journal of the American Ceramic Society* 92, no. 2 (2009): 429-432.
13. Panse, V. R., and S. J. Dhoble. *Optik* 219 (2020): 165107.
14. Zhou, Yipeng, Yunsheng Hu, Ronghui Liu, Yuanhong Liu, WeidongZhuang, Min Cao, TongyuGao, JunhangTian, Yanfeng Li, and Guantong Chen. *Journal of Rare Earths* (2020).
15. N.S.Kokode, V.R.Panse, S.J.Dhoble, J.of advanced material letter 2015,6(7),616-619.

16. Wang, De-Yin, Teng-Ming Chen, and Bing-Ming Cheng. "Host sensitization of Tb³⁺ ions in tribarium lanthanide borates Ba₃Ln (BO₃)₃ (Ln= Lu and Gd)." *Inorganic chemistry* 51, no. 5 (2012): 2961-2965.
17. Qiao, Xuebin, and Hyo Jin Seo. "Phase transition, structural and spectroscopic properties of Ba₃Y (BO₃)₃ phosphor." *Journal of Alloys and Compounds* 637 (2015): 504-508.
18. Hargunani, Sanjay Prakash, RajkumarPandurangSonekar, Anoop Singh, AjitKhosla, and SandeepArya. "Structural and spectral studies of Ce³⁺ doped Sr₃Y (BO₃)₃ nano phosphors prepared by combustion synthesis." *Materials Technology* (2020): 1-12.

Structural and spectral studies of Ce³⁺ ...
tandfonline.com/doi/full/10.1080/10667857.2020.1859052

Home | All Journals | Materials Technology | List of Issues | Volume 37, Issue 7 | Structural and spectral studies of Ce³⁺ ...

Materials Technology
Advanced Performance Materials
Volume 37, 2022 - Issue 7

Submit an article | Journal homepage

285 Views
11 CrossRef citations to date
8 Altmetric

Research Article
Structural and spectral studies of Ce³⁺ doped Sr₃Y(BO₃)₃ nano phosphors prepared by combustion synthesis
Sanjay Prakash Hargunani, Rajkumar Pandurang Sonekar, Anoop Singh, Ajit Khosla & Sandeep Arya
Pages 450-461 | Received 04 Sep 2020, Accepted 19 Nov 2020, Published online: 09 Dec 2020
Cite this article | <https://doi.org/10.1080/10667857.2020.1859052> | Check for updates

Full Article | Figures & data | References | Citations | Metrics | Reprints & Permissions | Read this article

ABSTRACT
In this work, a series of Ce³⁺ activated Sr₃Y(BO₃)₃ phosphors were synthesized by the solution combustion method. The synthesized phosphors were characterized via X-ray diffraction (XRD), scanning electron microscopy (SEM) and Fourier transform infrared

Related Research
People also read | Recommended articles | Cited by 11

Sample our Physical Sciences Journals
-> Sign in here to start your access

Search | 12:17 PM

PAPER • OPEN ACCESS

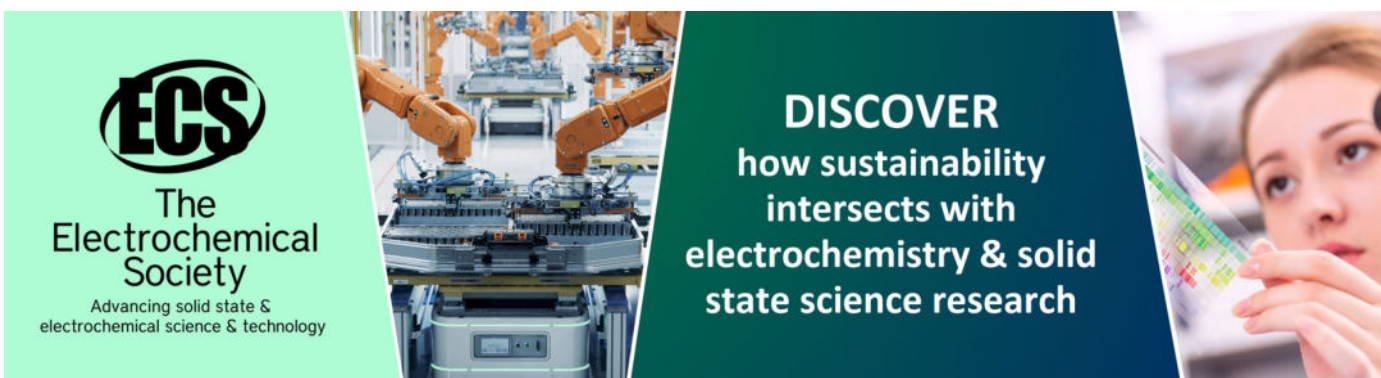
Combustion synthesis of $\text{Ba}_3\text{Y}_{1-x}\text{Sm}^{3+}_x(\text{BO}_3)_3$ as red-light emitting phosphors for indoor plant cultivation applications

To cite this article: S P Hargunani *et al* 2021 *J. Phys.: Conf. Ser.* **1913** 012016

View the [article online](#) for updates and enhancements.

You may also like

- [Crystal structure and luminescence properties of thermally stable \$\text{Sm}^{3+}\$ -doped \$\text{Sr}_3\text{In}\(\text{PO}_4\)_7\$ orange-red phosphor](#)
Ke Su, Qianxin Zhang, Xuening Yang et al.
- [\$\text{SrIn}_2\text{O}_4:\text{Eu}^{3+}, \text{Sm}^{3+}\$: A Red Emitting Phosphor with a Broadened Near-Ultraviolet Absorption Band for Solid-State Lighting](#)
Panlai Li, Zhijun Wang, Zhiping Yang et al.
- [Energy transfer mechanism from \$\text{Gd}^{3+}\$ to \$\text{Sm}^{3+}\$ in \$\text{K}_3\text{Gd}\(\text{PO}_4\)_2:\text{Sm}^{3+}\$ phosphor](#)
Palvi Gupta, A K Bedyal, Vinay Kumar et al.



ECS
The
Electrochemical
Society
Advancing solid state &
electrochemical science & technology

DISCOVER
how sustainability
intersects with
electrochemistry & solid
state science research

Combustion synthesis of $\text{Ba}_3\text{Y}_{1-x}\text{Sm}^{3+}_x(\text{BO}_3)_3$ as red-light emitting phosphors for indoor plant cultivation applications

S P Hargunani^{1*}, R P Sonekar¹, Harmanpreet Kaur², J G Mahakhode³ and Samikha B Dhoble⁴

¹Department of Physics, G. S. College Khamgaon, India

²Department of Physics, University Institute of sciences, Chandigarh University, Mohali-140413, India

³Department of Electronics, D.B. Science College, Gondia-441614, India

⁴Department of Physics, R.T.M. Nagpur University, Nagpur, India

E-mail: spargunani.sh@gmail.com

Abstract. In this paper, a series of Sm activated $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ phosphors are synthesized by high-temperature solution combustion method. The concentration of Sm ions is changed from 1 to 5 mol% in the host lattice of BYB crystal. The crystal structure, phase of formation, particle size, elemental analysis, photoluminescence study of synthesized phosphors are done using X-ray diffraction, FE-SEM, Fourier transform infrared spectroscopy (FTIR) and photoluminescent (PL) techniques. The excitation spectra consisted of strong bands in the NUV and blue region. The phosphors on excitation at 449 nm exhibited a strong emission peak in the region 630–660 nm, which corresponds to the absorption spectra of PR phytochrome. The obtained photometric results show that these can be used for the design of light-emitting diodes for indoor plant applications, houseplants gardening and in horticultural fixtures.

Keywords: Red phosphor; samarium; BYB crystal; Indoor plants; phytochrome.

1. Introduction

In the recent scenario, innovations of “horticulture” has been increasing tremendously due to its advantages over the conventional approaches used for the growth of plants under sunlight. Undoubtedly, “natural and artificial” light plays a pivotal role in the development of plants via different plant mechanisms [1–4]. In plants chlorophyll A, chlorophyll B absorbed the light in UV-blue region in the range 420–500 nm and phytochrome (P_R), phytochrome (P_{FR}) absorbed the light in the “red and far-red” region from 640 to 750 nm. [5–7]. The red color plays a vital role in plant growth. Therefore much emphasis has been paid on the development of red phosphors for indoor plant lighting devices. Up to now, many Mn^{4+} and Eu^{3+} doped phosphors have been reported as red light-emitting phosphors for room and greenhouse plant requirement [8–11]. This is due to the reason the emission spectral line of these phosphors match well the absorption lines of Phytochrome P_R . In a recent study by Rajendran and Vaidyanathan [12], authors reported for the first time Sm^{3+} activated $\text{NaSrY}(\text{MoO}_4)_3$ phosphors for the fabrication of LEDs for plant growth. In the present report, Sm^{3+} activated $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ phosphor



for indoor plant applications synthesized via combustion route. It is found that under blue excitation at 449 nm, the phosphors exhibit wide emission spectra from 630nm to 660 nm, which matches well with the absorption spectra of P_R . Thus, this phosphor can be used for the development of Light emitting diodes for in-house plant applications, for sun-shed plant growth, and indoor gardening.

$Ba_3Y(BO_3)_3$ belongs to the $M_3Ln(BO_3)_3$ family [13]. The BYB crystal exists in two structures i.e., low-temperature α - $Ba_3Y(BO_3)_3$ with space group $P6_3cm$ and high-temperature β - $Ba_3Y(BO_3)_3$ with space group $R3$. The photoluminescence properties under doping are different for both phases. The structure of low-temperature phase α - $Ba_3Y(BO_3)_3$ is consist of boron atoms with three fold coordinates, yttrium ions having sixfold coordinates, barium atoms having nine and six coordinates[14]. Maggayet *al.* synthesized the $Ba_3Y(BO_3)_3: Eu^{3+}, Bi^{3+}$ phosphor via solid-state reaction and studied it as a phosphor for w-LEDs using N-UV LED chips [15]. Wu *et al.* described $Ba_3Y(BO_3)_3: Sm^{3+}$ as potential orange-red phosphors for white LEDs [16]. Yu *et al.* investigated luminescent and energy transfer in α - $Ba_3Y(BO_3)_3: Ce^{3+}, Tb^{3+}$ [17]. In the present work, the synthesis of $Ba_3Y(BO_3)_3$ phosphors by solution combustion method is a new approach. The luminescent properties of Sm^{3+} activated $Ba_3Y(BO_3)_3$ prepared by solution combustion method is not described yet. All the results are studied in detail.

2. Experimental

2.1 Materials & synthesis

Sm activated $Ba_3Y(BO_3)_3$ phosphors were synthesized using modified solution combustion route. SCS involves highly exothermic redox chemical reaction. It is chain of flaming, smoldering and explosive reaction. The starting precursors $Ba(NO_3)_2$, $Y(NO_3)_3$, H_3BO_3 , and $Sm(NO_3)_3 \cdot 6H_2O$ of analytical grade were taken according to stoichiometric ratio $Ba_3Y_{1-x}Sm_x(BO_3)_3$ ($x= 0.005, 0.01, 0.02, 0.03, 0.04, 0.05$ 0.01). As a source of Boron, Boric Acid is used. The compound is neutral. So neither extra oxidizer nor fuel is necessary for solution combustion synthesis. In 10 to 20ml double distilled water all precursors were dissolved. In this solution, fixed amount urea as a fuel was added calculated using propellant chemistry [18]. The solution was stirred on hot plate magnetic stirrer maintained at a temperature of 90 °C for 50 min. The viscous solution formed was transferred to Platinum crucible and kept into a 700 °C preheated muffle furnace. Within few minutes, the water evaporated and combustion reaction took place with the liberation of gases. The resulting foamy powder was grounded gently into a fine powder and subjected to further heat treatment at 950°C for 5 hours in a muffle furnace in reducing environment. Reducing environment was developed using activated charcoal. After heating the obtained phosphors were grounded into fine powder and used for further characterizations.

2.2 Characterizations

XRD of synthesized phosphor were recorded by Rigaku Miniflex II X-ray diffractometer using the $Cu-K_\alpha$ radiations ($\lambda= 1.54060 \text{ \AA}$) and scanning in the 2θ range from 10-80°. The obtained patterns were compared with the available ICSD file. The Fourier transform infrared spectra (FTIR) were recorded in the 300-4000 cm^{-1} range using FTIR spectrophotometer Model RZX (Perkin Elmer). The surface morphology and elements studies were done by scanning electron microscopy [Model JSM6100 (JEOL)]. The emission and excitation spectra were recorded using F-7000 FL spectrophotometer with a scan speed 240 nm/min. The width of the slit for excitation-emission spectra was set 1nm. All the characterizations were done at room temperature.

3. Results and Discussion

X-ray diffractograms were recorded to determine the phase and crystal structure of the synthesized phosphors. $Ba_3Y(BO_3)_3$ host lattice possesses hexagonal crystal structure with the space group $P6_3cm$ (No.185). All B^{3+} ions are coordinated with three O^{2-} ions forming the BO_3^{3-} triangles. Y sites with six co-ordination number and Ba sites with 9 co-ordination number are separated by parallel planes of BO_3^{3-} anion group. The crystal structure is comprised of isolated BO_3 triangles, YO_6 octahedral and

BaO₄ polyhedral. Figure 1 represents the XRD patterns of Ba₃Y_{0.97}(BO₃)₃:0.03Sm³⁺ phosphors. The XRD patterns are well-matched with the standard inorganic crystal structure (ICSD) file (reference no. 99537) of the Ba₃Y(BO₃)₃ structure.

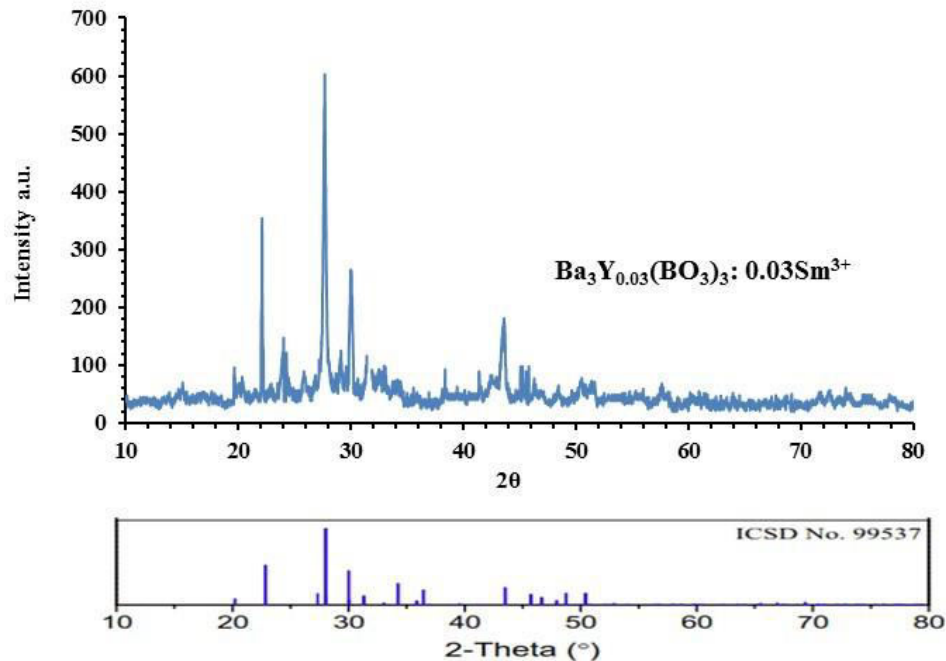


Figure 1. XRD & ICSD file of Ba₃Y_{0.97}(BO₃)₃:0.03Sm³⁺ phosphor

Figure 2 represents the FTIR spectra of the Ba₃Y_{0.97}(BO₃)₃:0.03Sm³⁺ sample in the region 300–4000 cm⁻¹. The strong bands above 1100 cm⁻¹ are due to the B–O stretching mode of the triangular [BO₃]⁻ groups [19]. The bands in the range 700–800 cm⁻¹ correspond to the B–O out of plane bending vibration, which confirms the presence of the [BO₃]⁻ groups. Due to the complete combustion of nitrate and organic matter peaks in 1500–2000 cm⁻¹ were absent. The presence of peak at 523 cm⁻¹ relates to the Y–O vibrational motion [20].

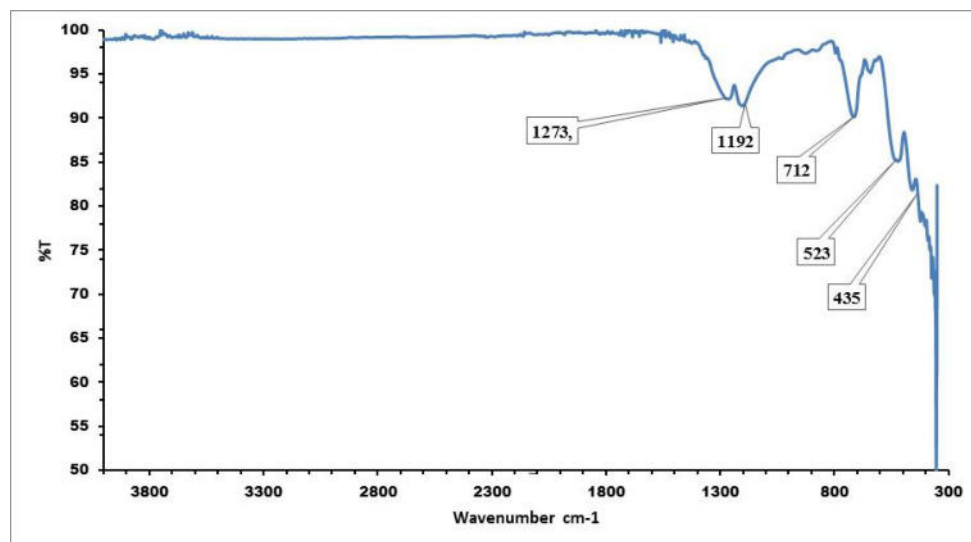


Figure 2. FTIR of Ba₃Y_{0.97}(BO₃)₃:0.03Sm³⁺

The “SEM micrographs” of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ phosphors at various magnifications are displayed in figure 3 (a-b). From the microstructures, it seems to be that the particles consist of non - uniform grains with agglomeration. The cause of the agglomeration is due to the high-temperature treatment [21]. The “Average particle size” is in the sub-micrometer range due to the “agglomeration of the particles”. Fig. 4 represents the EDX spectra of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ phosphors. The spectra consist of Ba, Y, B, O, and Sm elements. No other elements than these are found, which represent that organic residues are completely removed. These results are “Consistent with the FTIR and XRD” results.

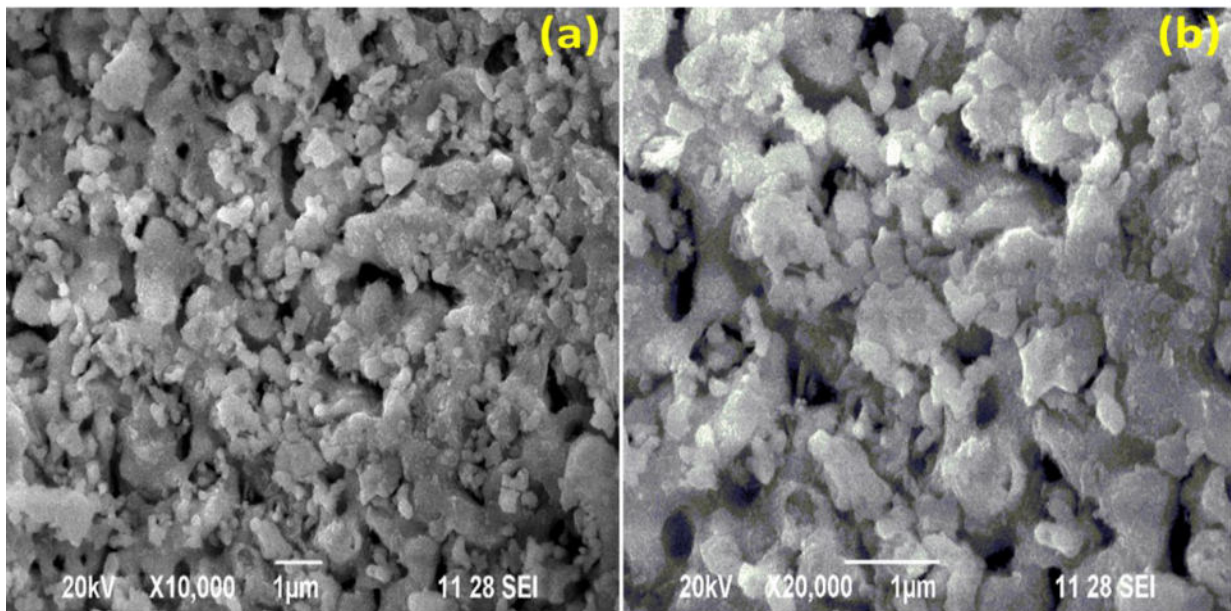


Figure 3. (a-b) SEM micrographs of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ phosphor at different magnifications

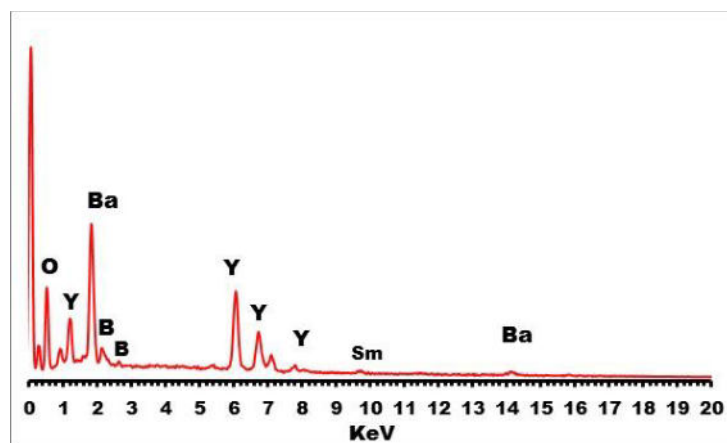


Figure 4. EDX spectra of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ phosphor

Figure 5 represents the PL excitation spectra (PLE) of $\text{Ba}_3\text{Y}_{0.03}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ recorded in the region 300-550 nm at 644 nm emission wavelength. PLE spectrum consists of three main peaks at 388 nm (${}^6\text{H}_{5/2}$ to ${}^6\text{P}_{7/2}$), 449 nm (${}^6\text{H}_{5/2}$ to ${}^4\text{P}_{7/2}$), and 487 nm (${}^6\text{H}_{5/2}$ to ${}^4\text{I}_{11/2}$) [22]. The intensity of the PLE peak at 449 nm is highest. Figure 6 shows the PL of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ under 449 nm excitation. At 449 nm excitation, the PL spectra show three emission peaks centered at 590 nm, 644 nm, and 651 nm which are due to intra 4f shell transitions from excited level ${}^4\text{G}_{5/2}$ to ground level ${}^6\text{H}_{5/2}$, ${}^6\text{H}_{7/2}$, ${}^6\text{H}_{9/2}$ of

Sm^{3+} ions, respectively [23]. The broadband in the region 630-660 nm well matches with the absorption spectra of Pr_R . Thus, $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3: 0.03\text{Sm}^{3+}$ phosphor can be used to modulate plant growth. The peak at 590 nm corresponding to the $^4\text{G}_{5/2}$ to $^6\text{H}_{5/2}$ transitions is magnetic dipole transition and does not affect by crystal field. The peak at 644 and 651 nm were related to the $^4\text{G}_{5/2}$ to $^6\text{H}_{9/2}$ is electric dipole transitioning and dependent on the crystal field. Mostly, the “Intensity of electric dipole transition to the intensity of Magnetic dipole transition” is used to determine the symmetry of local surroundings of Sm^{3+} in the crystal [16,24,25]. It is found that that the “Ratio of the Intensity of the Electric to Magnetic Dipole Transition is less than one”, which represents that the Sm^{3+} ions have occupied the symmetry position in the host crystal lattice. The emission spectra of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3: 0.03\text{Sm}^{3+}$ is also recorded under excitation at 388 nm, as shown in figure 7. The peak shape of all the samples was the same except noticeable change in intensity of peaks at 590 nm and 644 nm. To study the phenomena of concentration quenching in $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Sm}^{3+}$ ($x= 0.01, 0.02, 0.03, 0.04, 0.05$), the emission spectra are recorded at 449 nm excitation wavelength. PL spectra of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Sm}^{3+}$ phosphors are shown in figure 8. It can be seen from fig. 8 that P-L intensity increases with an increase in the Sm^{3+} ion concentration. The optimum Photo-Luminescence intensity is noticed for $x=0.03$, and beyond this concentration quenching followed. The probable reason of concentration quenching is increase in non-radiative transitions. The variation in the intensity with Sm concentration is shown in figure 9.

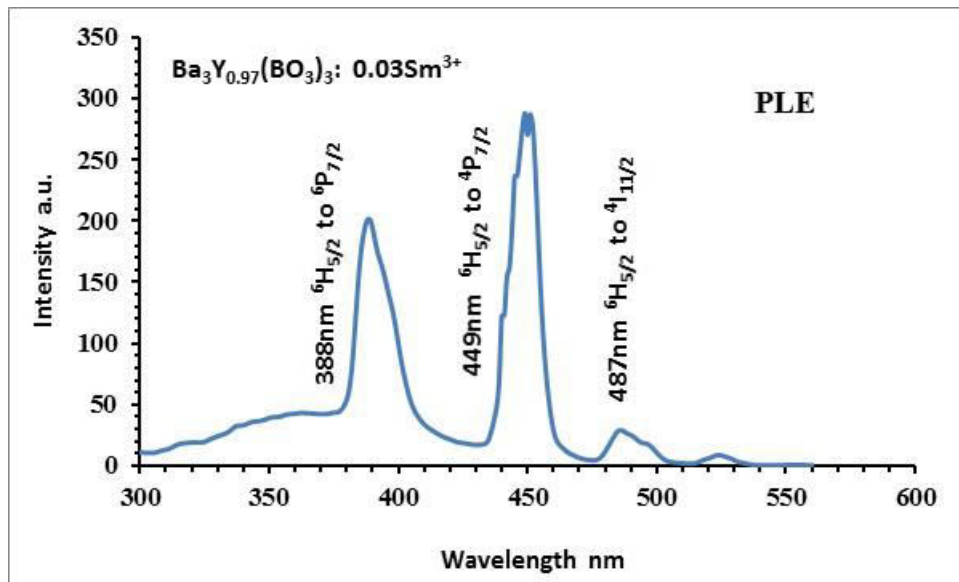


Figure 5. PLE of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ at room temperature

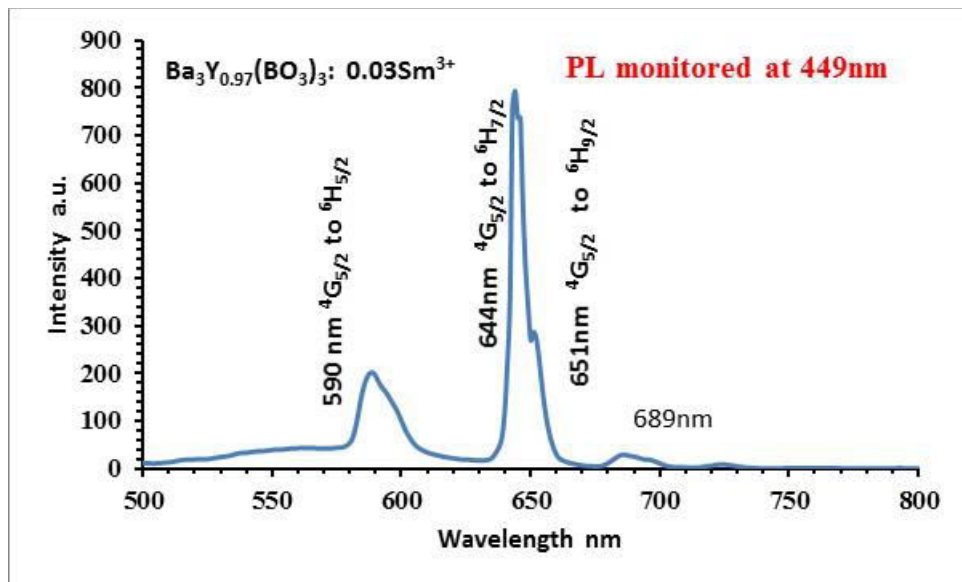


Figure 6. PL emission spectra of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ at room temperature

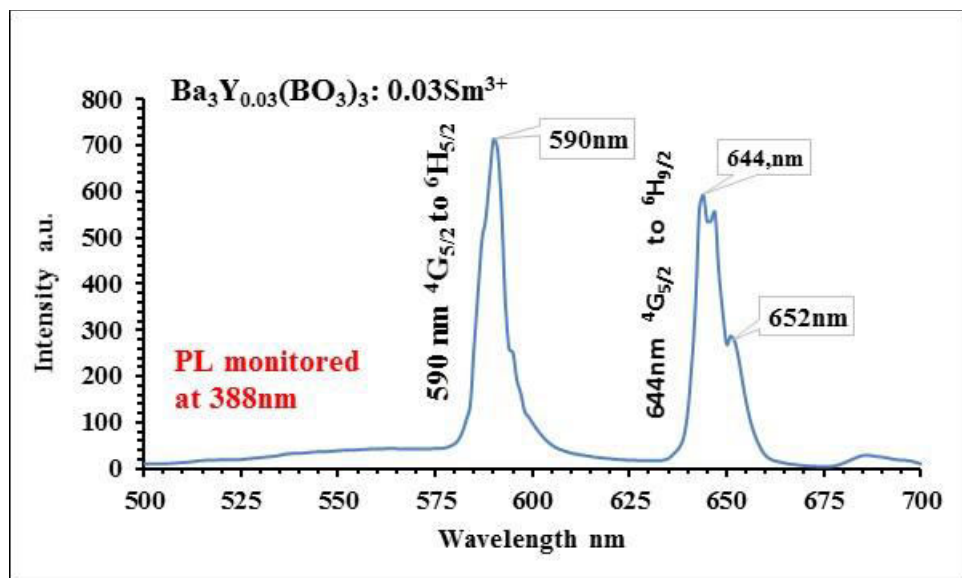


Figure 7. PL of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ at room temperature

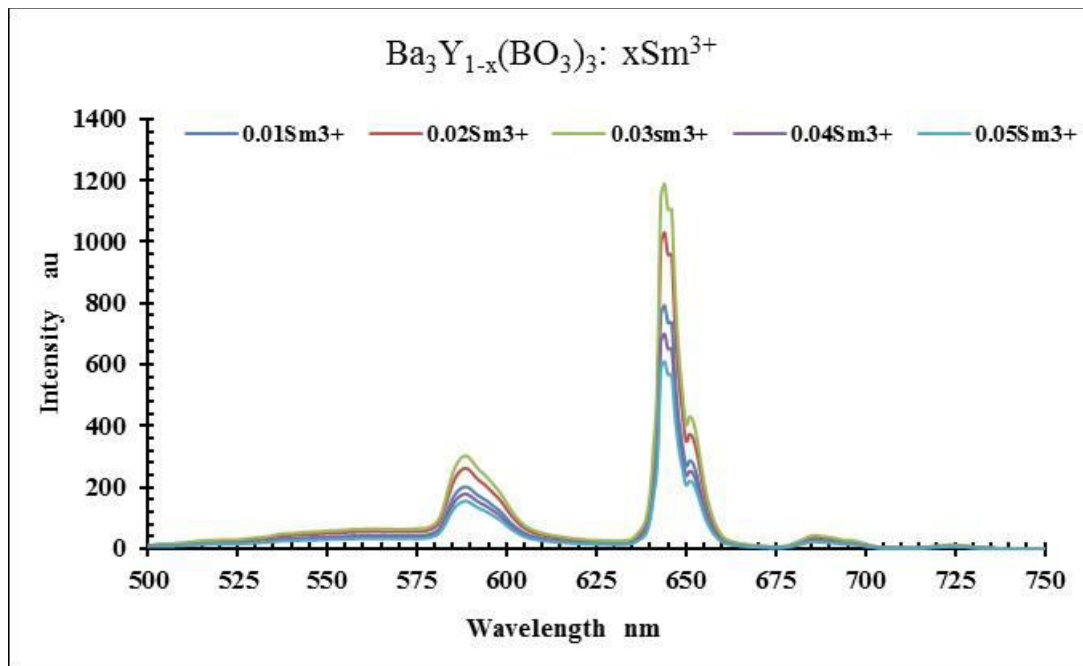


Figure 8. PL of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Sm}^{3+}$

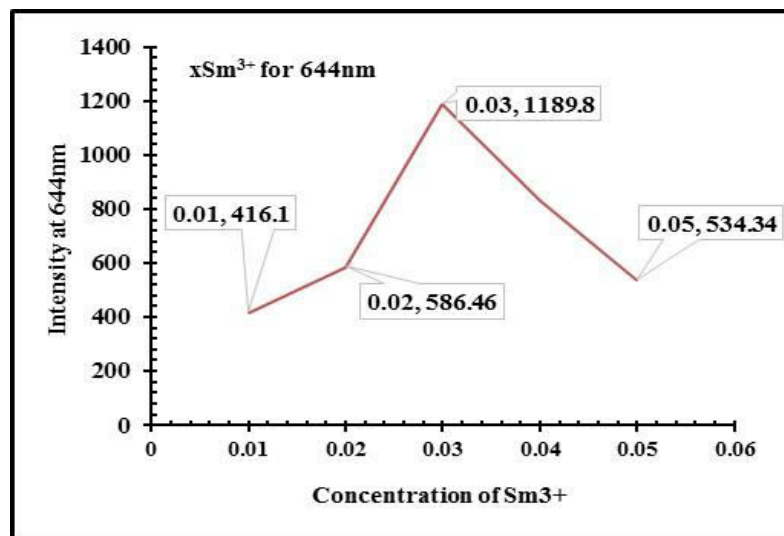


Figure 9. Variation in PL intensity with Sm ion concentration

Figure 10 and 11 represent the CIE chromaticity coordinates & color gamut diagram of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ phosphor. The “CIE coordinates” of the phosphor $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ for fixed concentration of Sm^{3+} at 449 nm and 388 nm excitation were computed. The “CIE coordinates for spectra” observed under 449 nm and 388 nm excitation were determined to be (0.722, 0.277) and (0.602, 0.396), respectively. The “CIE coordinates” under excitation at 449 nm fall in the deep-red region. These phosphor-compounds can be excited by NUV and blue light, so can be used to fabricate the LEDs.

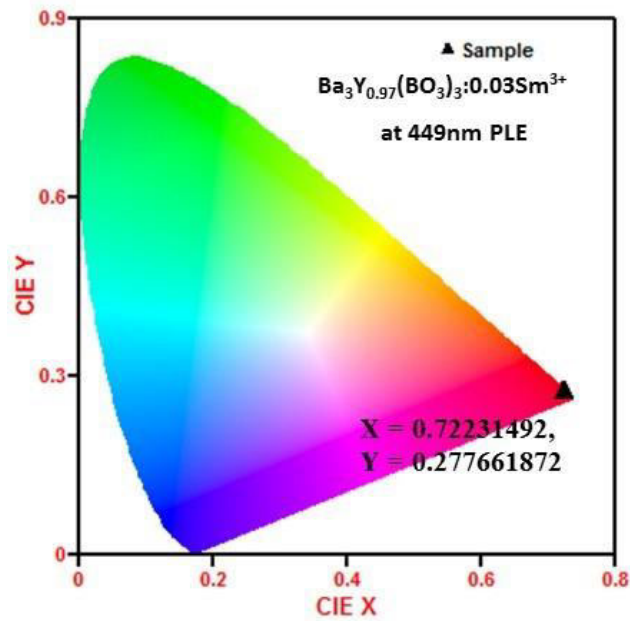


Figure 10. CIE diagram of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ excitation at 449 nm

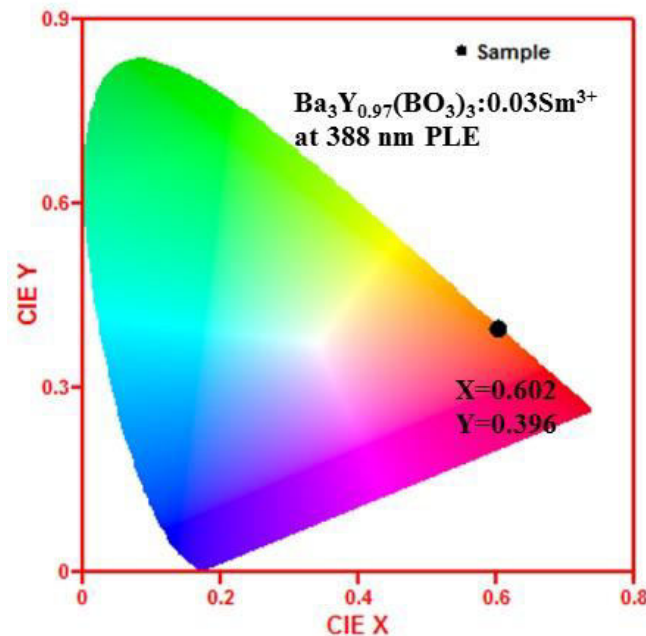


Figure 11. CIE diagram of $\text{Ba}_3\text{Y}_{0.97}(\text{BO}_3)_3:0.03\text{Sm}^{3+}$ excitation at 388 nm

4. Conclusions

$\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Sm}^{3+}$ phosphors were synthesized by modified solution combustion route. XRD pattern confirmed the $\alpha\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ structure of synthesized phosphors. The microstructures confirmed the formation of agglomerated particles with the average size in sub-micrometer range. It was observed that under excitation at 449 nm, PL spectrum consisted of highly intense peak at 644 nm, low-intensity peak at 589 nm, 651 nm and at 690 nm, while excitation at 388 nm, PL spectrum consisted of highly intense peak at 589 nm and low intensity line at 644 nm and 652 nm. Thus, by

changing the excitation wavelength, the color of emission changed from pure red to radish orange. It is color-tunable phosphor under photoluminescence excitation at two different wavelengths. In addition, the emission spectra of the prepared phosphors correspond to the absorption spectra of P_R phytochrome. The maximum Photoluminescence intensity was found for 3 mol% of Sm³⁺ ions. The CIE – chromaticity coordinates also fall in the red region. Also, the emission spectra of the presented phosphors correspond to the absorption spectra of P_R phytochrome. The emission of phosphors in the Red region under blue excitation makes them suitable candidates for ‘Red’ light-emitting diodes for “In-house plant applications”, “Indoor plant gardening”.

References

- [1] Kang, M., Wu, H., Yang, Q., Huang, L., Hu, Q., Ma, T., Li, Z. and Liu, J., 2020. A chromosome-scale genome assembly of *Isatis indigotica*, an important medicinal plant used in traditional Chinese medicine. *Horticulture research*, **7**(1) pp110.
- [2] Ditta, A. and Arshad, M., 2016. Applications and perspectives of using nanomaterials for sustainable plant nutrition. *Nanotechnol Rev* **5** 209–229.
- [3] Cupellini, L., Calvani, D., Jacquemin, D. and Mennucci, B., 2020. Charge transfer from the carotenoid can quench chlorophyll excitation in antenna complexes of plants. *Nature communications*, **11**(1) pp1-8.
- [4] Arsenault, E.A., Yoneda, Y., Iwai, M., Niyogi, K.K. and Fleming, G.R., 2020. Vibronic mixing enables ultrafast energy flow in light-harvesting complex II. *Nature communications*, **11**(1) pp1-8.
- [5] Xiang, J., Chen, J., Zhang, N., Yao, H. and Guo, C., 2018. Far red and near infrared double-wavelength emitting phosphor Gd₂ZnTiO₆: Mn⁴⁺, Yb³⁺ for plant cultivation LEDs. *Dyes and Pigments*, **154**pp257-262.
- [6] Ren, Y., Chen, T., Su, L., Cheng, X., Chen, T., Guo, S. and Yu, X., 2019. Photoluminescence properties of Ba₂LaSbO₆: Mn⁴⁺ deep-red-emitting phosphor for plant growth LEDs. *Journal of Luminescence*, **209**, pp1-7.
- [7] Zhang, Y., Huang, Y., Li, M., Liang, C., Zhu, H., Zhong, Y., Yang, N., Zhou, Z. and Xia, M., 2020. Tuning the luminescence properties of Mn⁴⁺-activated CaYAlO₄ phosphor by co-doping cations for indoor plant cultivation. *Journal of the American Ceramic Society*.
- [8] Shi, L., Wang, S., Han, Y.J., Ji, Z.X., Liu, L., Ma, D., Mu, Z.F., Mao, Z.Y., Wang, D.J., Zhang, Z.W. and Zhao, Y., 2020. Effects of Ti⁴⁺-and W⁶⁺-substitution on photoluminescence properties of Sr₂GdSbO₆: Mn⁴⁺ phosphor for plant cultivation. *Journal of Alloys and Compounds*, pp 154475.
- [9] Kong, Li, Yingying Liu, Langping Dong, Liang Zhang, Lu Qiao, Wensheng Wang, and Hongpeng You. 2020 "Enhanced red luminescence in CaAl₁₂O₁₉: Mn⁴⁺ via doping Ga³⁺ for plant growth lighting." *Dalton Transactions* 496 1947-1954.
- [10] Hu, J., Huang, T., Zhang, Y., Lu, B., Ye, H., Chen, B., Xia, H. and Ji, C., 2019. Enhanced deep-red emission from Mn⁴⁺/Mg²⁺ co-doped CaGdAlO₄ phosphors for plant cultivation. *Dalton Transactions*, **48**(7) pp455-2466.
- [11] Chen, J., Zhang, N., Guo, C., Pan, F., Zhou, X., Suo, H., Zhao, X. and Goldys, E.M., 2016. Site-dependent luminescence and thermal stability of Eu²⁺ doped fluorophosphate toward white LEDs for plant growth. *ACS applied materials & interfaces*, **8**(32) pp20856-20864.
- [12] Marikumar, R. and Vaidyanathan, S., 2020. Zero-concentration quenching: A Novel Eu³⁺ based red phosphor with Non-layered crystal structure for white LEDs and NaSrY (MoO₄)₃: Sm³⁺ based deep-red LEDs for plant growth. *Dalton Transactions*.
- [13] Khamaganova, T.N., 2006. Synthesis of indium alkali-earth double borates M₃In(BO₃)₃. *Russian journal of inorganic chemistry*, **51**(1) pp32-34.
- [14] Pan, S., Hu, Z., Lin, Z. and Wang, G., 2003. Growth and X-ray diffraction of Nd³⁺-doped Ba₃Y(BO₃)₃ crystal. *Journal of crystal growth*, **247**(3-4) pp452-456.
- [15] Maggay, I.V.B. and Liu, W.R., 2018. Novel red-emitting Ba₃Y(BO₃)₃: Bi³⁺, Eu³⁺ phosphors for N-UV white light-emitting diodes. *Journal of nanoscience and nanotechnology*, **18**(1), pp3-10.
- [16] Wu, X., Zheng, J., Ren, Q., Bai, W., Ren, Y. and Hai, O., 2019. Synthesis and luminescent properties of a novel orange-red Ba₃Y(BO₃)₃: Sm³⁺ phosphors for white LEDs. *Polyhedron*, **164**pp17-22.
- [17] Cheng, Z., Yu, J., Zhang, Y. and Zou, N., 2017. Luminescence and energy transfer mechanism of α-Ba₃Y(BO₃)₃: Ce³⁺, Tb³⁺. *Journal of Luminescence*, **192**pp1004-1009.
- [18] Patil, K.C., Aruna, S.T. and Ekambaram, S., 1997. Combustion synthesis Curr. Opin. Solid State Mater. Sci. **2** 158–165.

- [19] Hargunani, S.P., Palaspagar, R.S., Sonekar, R.P. and Omanwar, S.K., 2019, May. Photo-luminescence study of red borate phosphor $\text{Sr}_3\text{Y}_{1-x}(\text{BO}_3)_3:x\text{Eu}^{3+}$. In *AIP Conference Proceedings* (Vol. 2104, No. 1, p. 030027). AIP Publishing LLC.
- [20] Kumar, D., Sharma, M. and Pandey, O.P., 2015. Morphology controlled $\text{Y}_2\text{O}_3:\text{Eu}^{3+}$ nanophosphors with enhanced photoluminescence properties. *Journal of Luminescence*, **158** pp268-274.
- [21] Shi, L., Wang, S., Han, Y.J., Ji, Z.X., Ma, D., Mu, Z.F., Mao, Z.Y., Wang, D.J., Zhang, Z.W. and Liu, L., 2020. $\text{Sr}_2\text{LaSbO}_6:\text{Mn}^{4+}$ far-red phosphor for plant cultivation: Synthesis, luminescence properties and emission enhancement by Al^{3+} ions. *Journal of Luminescence*, **221** pp 117091.
- [22] Motloung, S.J., Lephoto, M.A., Tshabalala, K.G. and Ntwaeborwa, O.M., 2018. Combustion synthesis and characterization of $\text{MVO} \cdot 5\text{P}_2\text{O}_7$: Sm^{3+} , Tm^{3+} (M= Gd, La, Y). *Physica B: Condensed Matter*, **535** pp211-215.
- [23] Durairajan, A., Balaji, D., Rasu, K.K., Babu, S.M., Valente, M.A., Thangaraju, D. and Hayakawa, Y., 2016. Sol-gel synthesis and photoluminescence analysis of $\text{Sm}^{3+}:\text{NaGd}(\text{WO}_4)_2$ phosphors. *Journal of Luminescence*, **170** pp743-748.
- [24] Naktode, P.K., Shinde, K.N. and Kokode, N.S., 2016. Effective red-orange emitting $\text{CaMgPO}_4\text{Cl}:\text{Sm}^{3+}$ halophosphate phosphor. *Results in physics*, **6**pp.869-872.
- [25] Mahajan, R., Kumar, S., Prakash, R. and Kumar, V., 2018, August. Synthesis and luminescent properties of Sm^{3+} activated lithium zinc borate phosphor. In *AIP Conference Proceedings* (Vol. 2006, No. 1, p. 030045). AIP Publishing LLC.

PAPER • OPEN ACCESS

Wavelength down-conversion study of $\text{Ba}_3\text{Y}_{1-X}(\text{BO}_3)_3: x \text{Tb}^{3+} \& \text{Eu}^{3+}$ [$0.005 \leq X \leq 0.05$] phosphor for solid state lighting applications

To cite this article: S P Hargunani *et al* 2021 *J. Phys.: Conf. Ser.* **1913** 012021

View the [article online](#) for updates and enhancements.

You may also like

- [Efficient white light emitting diodes based on Cu-doped ZnInS/ZnS core/shell quantum dots](#)
Xi Yuan, Jie Hua, Ruosheng Zeng et al.
- [Measurement model of circadian action factor of phosphor-converted white LEDs based on photometric, electrical, and thermal properties](#)
Xuehua Shen, Huanting Chen, Min Xu et al.
- [Recent Advances and Challenges in Obtaining Stable \$\text{CsPbX}_3\$ \(\$X = \text{Cl, Br, and I}\$ \) Nanocrystals Toward White Light-Emitting Applications](#)
G. Krishnamurthy Grandhi, Krishnaiah Mokurala, Joo Hyeong Han et al.

ECS
The
Electrochemical
Society
Advancing solid state &
electrochemical science & technology

DISCOVER
how sustainability
intersects with
electrochemistry & solid
state science research

Wavelength down-conversion study of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x \text{Tb}^{3+} \& \text{Eu}^{3+}$ [$0.005 \leq x \leq 0.05$] phosphor for solid state lighting applications

S P Hargunani*¹, R M Chavan¹, R P Sonekar¹ and N S Dhoble²

¹G.S. Science, Arts, Commerce College, khamgaonDist:- Buldhana M.S. India

²Department of Chemistry, Sevadal Mahila Mahavidyalaya, Nagpur-4400099, Maharashtra, India

Email: *sphargunani.sh@gmail.com

Abstract. In this work, we synthesized the Tb^{3+} and Eu^{3+} doped $\alpha\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ phosphor using the solution combustion method. Using the powder XRD pattern and FTIR low-temperature phase of $\alpha\text{-Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Tb}^{3+} \& \text{Eu}^{3+}$ was confirmed. Element composition with percentage was verified by FE-SEM-EDS. Stoke's shift values were calculated which confirms the high thermal stability of the phosphor & its use in high power WLED. Photoluminescence study at room temperature was done. Intrinsic absorption due to the 4f-4f transition of Eu^{3+} results intense red emission from $\alpha\text{-Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Eu}^{3+}$ makes it suitable for pc-WLED and confirms the Centro-inversion symmetry site of Eu^{3+} in the host. Green emission at NUV excitation from $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Tb}^{3+}$ results from cross-relaxation of Tb^{3+} in a host. The concentration quenching reason for both activators was investigated by calculating and comparing critical distance. The purity of luminescence color was confirmed by plotting CIE-chromaticity co-ordinates on CIE-Color gamut. The entire work confirms the importance of synthesized phosphor along with previously reported same host materials. The reported phosphor may be suitable for NUV converted WLED, wavelength conversion devices, and high power RGB – WLED.

Keywords: Solution combustion, Borate Phosphors, Terbium, Europium, Photo-luminescence.

1. Introduction: Inorganic phosphors based WLED are widely used because of properties like energy efficiency, lifetime, stability, Cost-effective, design and ecofriendly nature. Inorganic luminescent materials have considerable importance in fluorescent lamps, solid-state lighting, phosphorescent paints, in road marking paints, high power LED etc. Wavelength conversion and color mixing are the most commonly used technology to produce white light [1-6]. So, the development of efficient phosphors for the wide possible applications is the favorite research area of material science. Abundant energy levels and the large number of possible transitions in the visible/UV light region makes the rare earths most common dopants in synthesis of borate phosphors [7]. Among Rare earth ion, Tb^{3+} is one of the most prospective green-emitting activators due to its 4f-4f transitions and Eu^{3+} is the promising red-emitting activator dopant [8].

The borate compound with formula $\text{M}_3\text{Ln}(\text{BO}_3)_3$ ($\text{M} = \text{Ba}, \text{Sr}, \text{and Ln} = \text{La-Lu}, \text{Y}, \text{Sc}$) were reported as promising phosphors for W-LED applications. The $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ crystal exists in two structures, i.e., low-temperature phase $\alpha\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ with space group P63cm and high-temperature phase $\beta\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ with space group R3. The photoluminescence properties under doping are different for both phases. The structure of $\alpha\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ is consist of 3-F-C boron atoms, 6-F-C yttrium atoms, 9 & 6-F-C barium atoms [9]. Irish Valerie et.al synthesized the $\text{Ba}_3\text{Y}(\text{BO}_3)_3: \text{Eu}^{3+}, \text{Bi}^{3+}$ phosphor via a solid-state reaction and studied it as a phosphor for w-LEDs using N-UV LED chips [10]. Xiulan Wu. *et.al.* described $\text{Ba}_3\text{Y}(\text{BO}_3)_3: \text{Sm}^{3+}$ as orange-red phosphor for WLEDs [11]. Jingjie Yu *et.al.* investigated luminescent and the



transfer of energy in α - $\text{Ba}_3\text{Y}(\text{BO}_3)_3:\text{Ce}^{3+}, \text{Tb}^{3+}$ [12]. Luminescent Research groups from all over the world are working for efficient phosphors for WLED had studied and proved the importance of borate host $\text{Ba}_3\text{Y}(\text{BO}_3)_3$. But synthesis of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ phosphor by solution combustion method is new approach. The luminescent properties of $\text{Eu}^{3+}\text{-Tb}^{3+}$ co-activated $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ prepared by solution combustion method is not described yet. $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ has been investigated for nonlinear optical applications and studied for w-LEDs applications by doping it with Eu^{3+} and Tb^{3+} . Photoluminescence (PL) properties, color chromaticity, Energy transfer mechanism for $\text{Eu}^{3+}, \text{Tb}^{3+}$ is also investigated.

2. Materials and methods: Powder samples of $\text{Ba}_3\text{Y}(\text{BO}_3)_3: x\text{RE}$ ($0 \leq x \leq 0.8$) ($\text{RE} = \text{Eu}^{3+}\text{-Tb}^{3+}$) were synthesized by a solution combustion method. The Exothermic reaction between nitrates and urea was used for the synthesis of the borate host luminescent materials. In the SCS, nitrate solution of A.R. grade [99.9% purity] precursors [$\text{Ba}(\text{NO}_3)_2, \text{Y}(\text{NO}_3)_3, \text{H}_3\text{BO}_3, \text{Eu}_2\text{O}_3, \text{Tb}_2(\text{SO}_4)_3$] in the stoichiometric amount was used as an oxidizer while NH_2CONH_2 is a fuel for combustion [13,14]. The boric acid is a neutral compound act as a source of boron. The chemical was combined with 10 ml of de-ionized water in a beaker and vigorously stirred for 20 min at a temperature of 90°C . The prepared paste was then kept in crucible and put in to a 680°C preheated furnace. The paste solution boiled and ignited within a few minutes to create a self-propagating flame, as shown in the figure 1. The entire combustion of solution with yellow-orange flame as shown in figure 1-A was completed in 4 to 5 minutes, but the crucible was left for the next few minutes in the furnace to ensure the completion of the decomposition. After removing crucible from the furnace, it cooled to room temperature. The prepared powder samples or foamy powder as shown in figure 1-Bis grinded into fine powders using pestle-mortar. The powders were post annealed at 950°C for 5 hours in a muffle furnace in air and in reducing environment using charcoal.

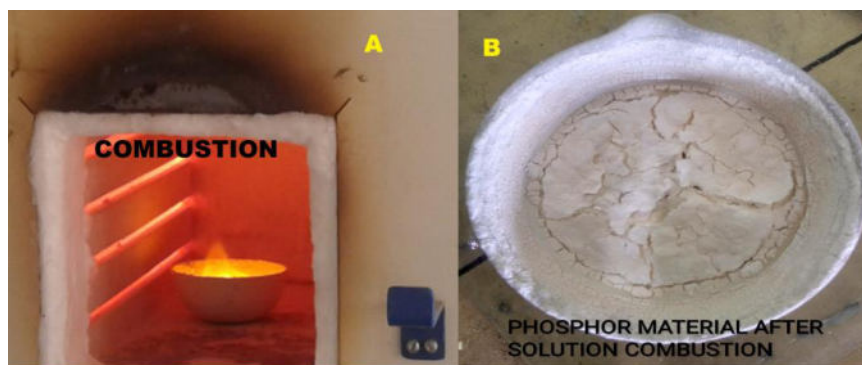


Figure 1. (A) Combustion in furnace (B) foamy powder after combustion

3. Results and discussion

3.1 XRD: On a R-M-II X-ray Diffractometer, powder X-ray spectra were taken and compared with available ICSD and JCPDS images. The synthesized phosphor powder XRD pattern was reported using the $\text{Cu-K}\alpha$ wavelength ($\lambda = 1.54060 \text{ \AA}$) and scanning from 20° - 80° . The powder XRD patterns of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ and $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{RE}$ [$\text{RE} = \text{Eu}^{3+}, \text{Tb}^{3+}$] phosphors are shown in figure 2. It is noted that all the diffraction peaks of $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{RE}$ powder phosphor matches with the standard JCPDS file no 51-1849 and ICSD file no 39744. As XRD patterns of different doped phosphors are same, we can draw the conclusion that prepared phosphors are single phase. The dopant $\text{Eu}^{3+}, \text{Tb}^{3+}$ ions don't distort

crystal structure of phosphor. $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ powder phosphor possesses hexagonal C-S with the S-G P63 cm (No.185). All B^{3+} are attached with three oxygen ions forming the BO_3^{3-} triangles. Y and Ba sites are separated by parallel planes constructed by BO_3^{3-} anion group. All Barium sites has the 9-co-ordination number. All Y^{3+} ions have the 6-co-ordination number. Crystal structure comprised of isolated BO_3 triangles; YO_6 octahedral and BaO_4 polyhedral. $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ possess layer structure of BO_3 triangles. Cell axes values are $a=b=9.419 \text{ \AA}$; $c=17.590 \text{ \AA}$; $V=1352.67 \text{ \AA}^3$ [15].

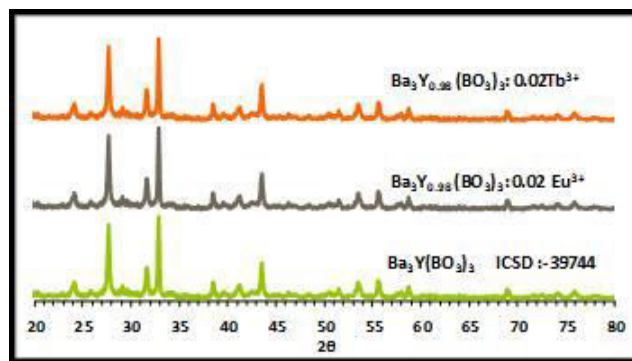


Figure 2. XRD and ICSD pattern of phosphors

3.2 FTIR: FTIR of sample was done on F.T. Infra-Red Spectrophotometer Model RZX (Perkin Elmer). The FT-IR spectra of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ and $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{RE}$ [RE= Eu^{3+} , Tb^{3+}] phosphors at NTP is given in Figure 3- A-B. The B-O stretching mode of the triangular $[\text{BO}_3]$ groups should be assigned to the peaks noted beyond 1050 cm^{-1} , while the bands with a limit of approximately 750 cm^{-1} are due to the B-O outside plane bending, confirming the presence of the $[\text{BO}_3]$. The lack of $1350\text{-}2500 \text{ cm}^{-1}$ peaks suggests the total removal of nitrate and organic matter. The absence of peak lines in $3200\text{-}3600 \text{ cm}^{-1}$ are due to unavailable O-H stretching mode. In the range of 650 cm^{-1} - 1600 cm^{-1} , FTIR shows some large bands. The 459 cm^{-1} , 544 cm^{-1} , 724 cm^{-1} bands represent the out of plane bending mode of the BO_3 group. The BO_3 groups inside plane movement are seen at 892 cm^{-1} , 939 cm^{-1} by the bands. The unsymmetrical straightenoscillation of the BO_3 unit is allocated to bands peaking at 1196 cm^{-1} , 1272 cm^{-1} and 1408 cm^{-1} .

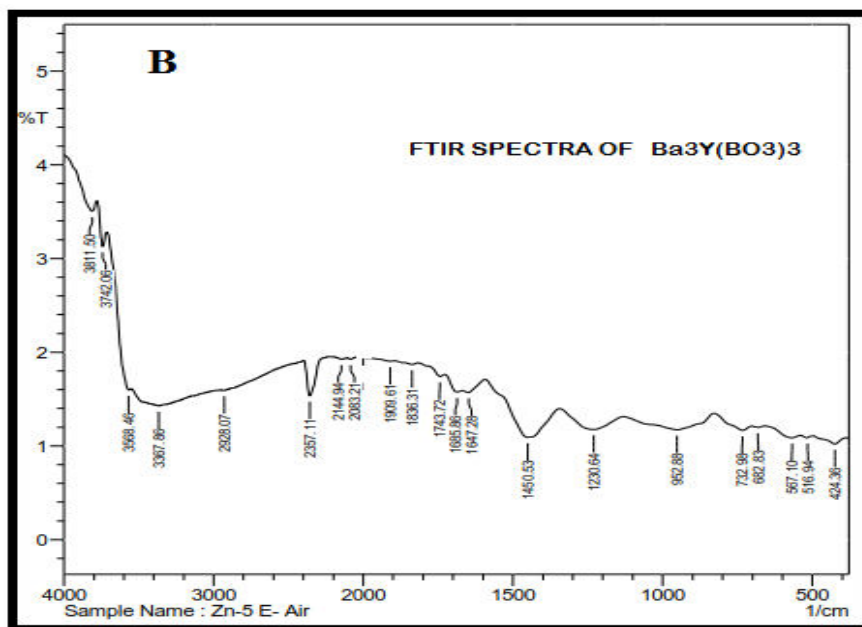
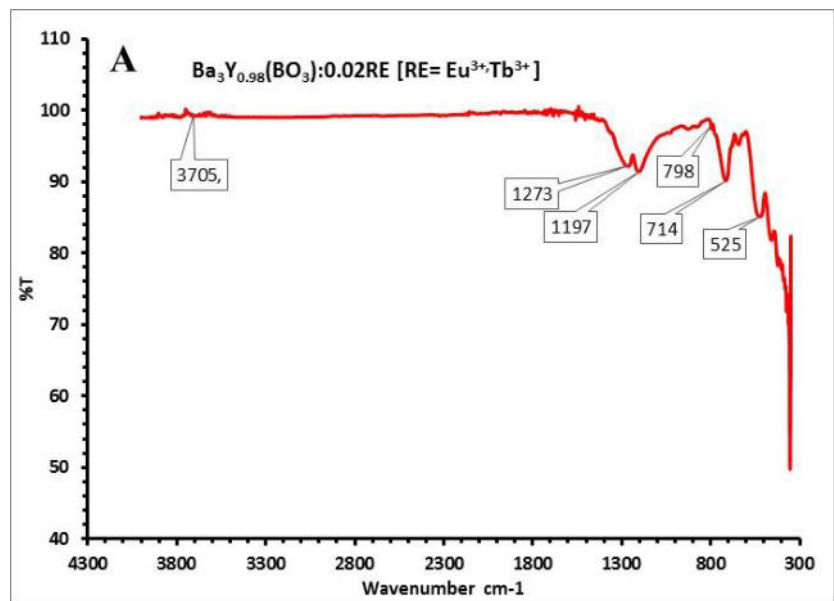


Figure 3. FTIR of (A) $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{Eu}^{3+}$ and (B) $\text{Ba}_3\text{Y}(\text{BO}_3)_3$

3.3 FE-SEM-EDS: For $Ba_3Y_{1-x}(BO_3)_3:xEu^{3+}$ calcined powder sample surface morphology and elemental composition analysis was performed. In Figure 4, the SEM micrographs of $Ba_3Y_{1-x}(BO_3)_3:xEu^{3+}$ phosphors are shown. The phosphor microstructure consists of irregular grains with phenomena of agglomerate. The synthesised phosphors particles have an average polycrystalline size of around 0.2-1 μm . SEM EDS graph confirms the presence of each element at proper concentration in as prepared phosphor material. FE-SEM photographs at different resolution are shown in inset of EDS graph given in figure 5. EDS elemental mappings show the presence of constituent elements Ba, Y, B, O, Eu, with a homogeneous distribution in the phosphor powders.

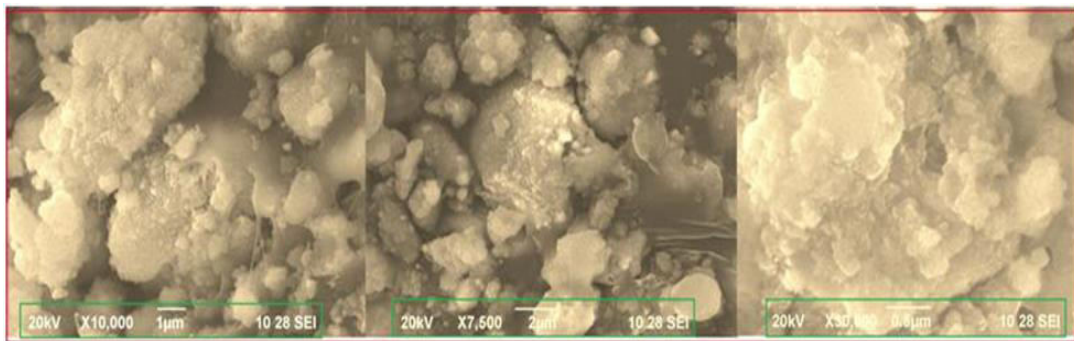


Figure 4. SEM micrographs of $Ba_3Y_{1-x}(BO_3)_3:xEu^{3+}$ phosphor

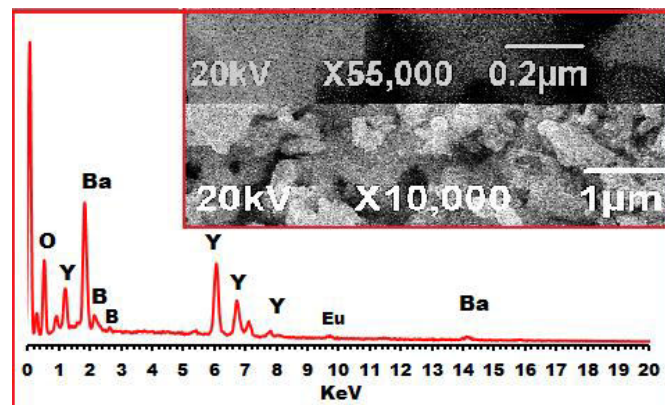


Figure 5. Element Mapping of SEM micrographs of $BYB: xEu^{3+}$ phosphor

3.4 Photo-Luminescence study

3.4.1 PL and PLE study of $Ba_3Y_{1-x}(BO_3)_3:xEu^{3+}$: Photoluminescence excitation (PLE) and emission spectra (PL) of $Ba_3Y_{0.98}(BO_3)_3:0.02Eu^{3+}$ material is given in figure 6. The spectrum is noted on F7000 FL Spectro-photometer under scan speed 240 nm/min, PLE-PL slit width 1nm. Broad absorption band ranging from 200nm to 400nm shows wide high intensity f-f shoulder peak at 350nm and low intensity CTB at 239nm. 350nm peak is due to the ${}^7F_0 \rightarrow {}^5D_4$ transition of Eu^{3+} in crystal. Emission spectrum monitored at 350nm consist of a series of sharp lines of wavelength 595nm [${}^5D_1 \rightarrow {}^7F_1$], 614nm [${}^5D_1 \rightarrow {}^7F_2$],

652nm [$^5D_1 \rightarrow ^7F_3$]. Stokes shift value at 350nm PLE and 614nm PL is $2340 \times 10^3 \text{cm}^{-1}$. To find optimal doping concentration of Eu^{3+} a series of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x \text{Eu}^{3+}$ [$x = 0.02, 0.03, 0.04, 0.05$] phosphor powder was synthesized and their PL emission spectra for 252nm excitation were recorded. Highest PL intensity was noted for 4 moles% of Eu^{3+} in phosphor.

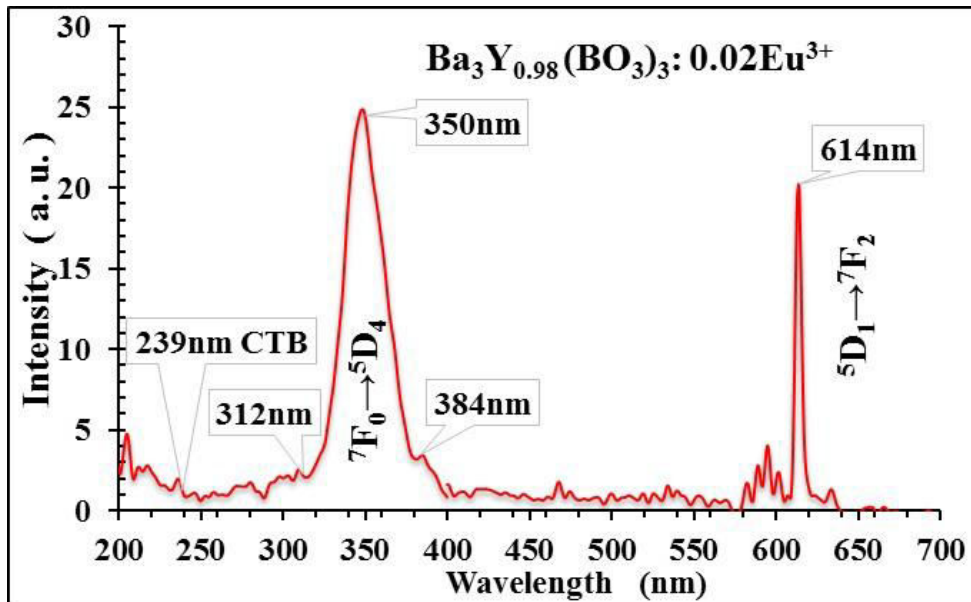


Figure 6. PL-PLE spectra of $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{Eu}^{3+}$ at room temperature

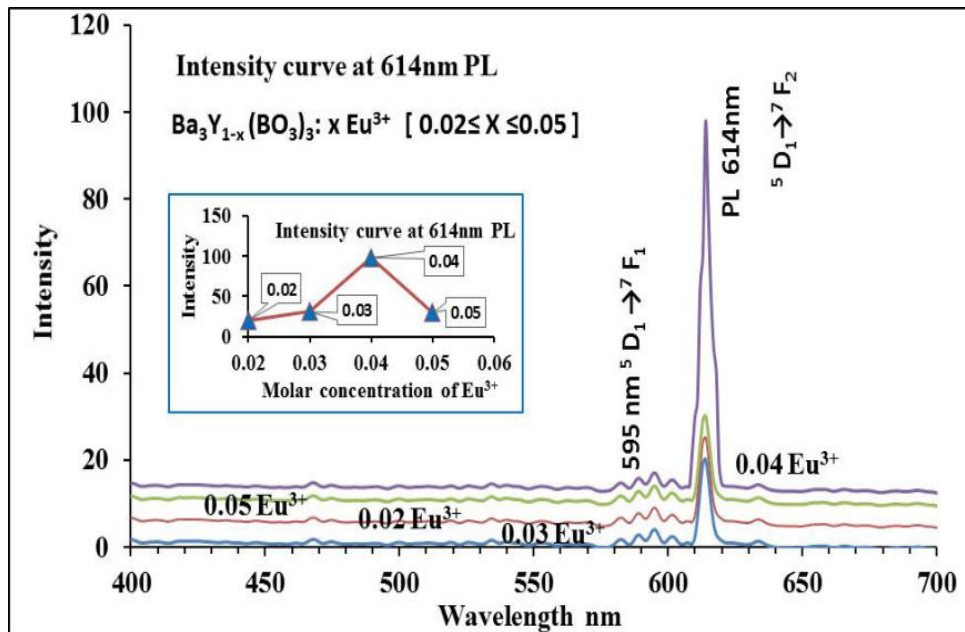


Figure 7. Concentration Quenching of $Ba_3Y_{1-x}(BO_3)_3: xEu^{3+}$ [$0.02 \leq X \leq 0.05$]

3.4.2 PL and PLE study of $Ba_3Y_{1-x}(BO_3)_3: xTb^{3+}$: -Photoluminescence excitation (PLE) and emission spectra (PL) of $Ba_3Y_{0.98}(BO_3)_3: 0.02Tb^{3+}$ phosphor is shown in figure 8. The excitation spectrum consists of a broadband ranging from 200 to 390nm with maximum intensity at 354nm and low intensity peaks at 224nm, 327nm. The excitation peak at 354nm is due to $^7F_6 \rightarrow ^5D_3$ transition of Tb^{3+} , low intensity peak at 224nm is due to $^7F_5 \rightarrow ^5D_4$ and 327nm corresponding to $^7F_4 \rightarrow ^5D_4$ transition of Tb^{3+} . Photoluminescence emission spectrum is recorded in the range 450nm to 700nm at 354nm excitation wavelength. Emission spectrum monitored at 354nm excitation consist of series of peaks ie 486nm ($^5D_4 \rightarrow ^7F_6$), 544nm ($^5D_4 \rightarrow ^7F_5$), 552nm ($^5D_4 \rightarrow ^7F_4$), 584nm ($^5D_4 \rightarrow ^7F_3$) that is almost in green region of spectrum. Photoluminescence emission intensity is maximum for 544nm line. When photoluminescence excitation is recorded by monitoring emission line at 544nm we get excitation peak at 354nm. Stokes shift value at 354nm PLE and 544nm PL is $2225 \times 10^3 cm^{-1}$. In order to decide concentration quenching series of $Ba_3Y_{1-x}(BO_3)_3: xTb^{3+}$ [$x=0.01, 0.02, 0.03, 0.04, 0.05$] powder phosphor prepared. PL for different concentrations of Tb^{3+} is recorded for the excitation of 354nm at room temperature and is shown in figure 9. Concentration quenching curve is shown inside the PL curve. Photoluminescence intensity for both important peaks 486nm and 544nm is maximum for 0.04 molar concentration of Tb^{3+} .

3.4.3 Concentration quenching: Beyond Critical concentration (4mole % for Eu^{3+} and Tb^{3+}) non radiative energy transfer takes place in dopant ions of phosphor. Critical distance $R_c [= (3V / 4\pi \chi_c N)^{1/3}]$ where 'V' is the volume of the unit cell, 'N' is the number of occupied sites in the unit cell, and ' χ_c ' is the critical concentration] for Eu^{3+} and Tb^{3+} is about 18 Å which is far greater than 5 Å indicates electric multipolar interaction as main reason of concentration quenching in phosphor material. Figure (10) shows quenching curve.

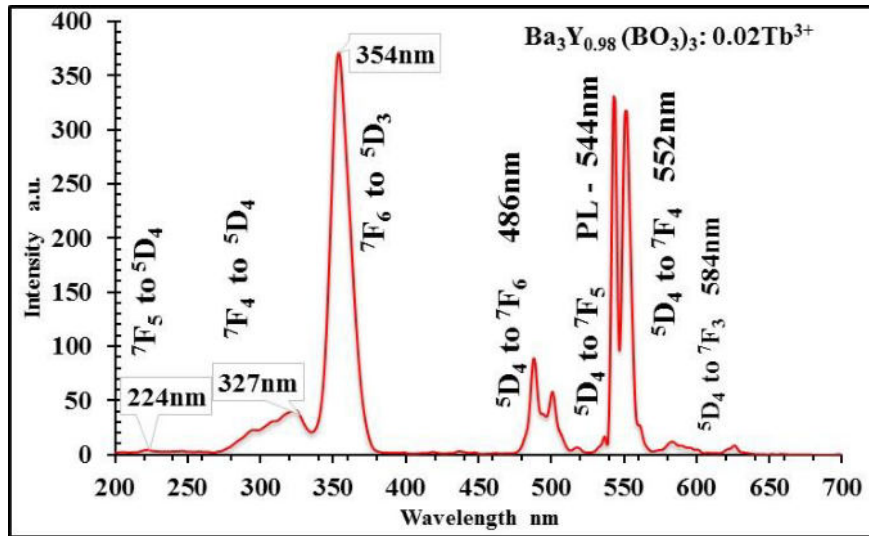


Figure 8. PLE-PL spectrum of $Ba_3Y_{0.98}(BO_3)_3: 0.02 Tb^{3+}$

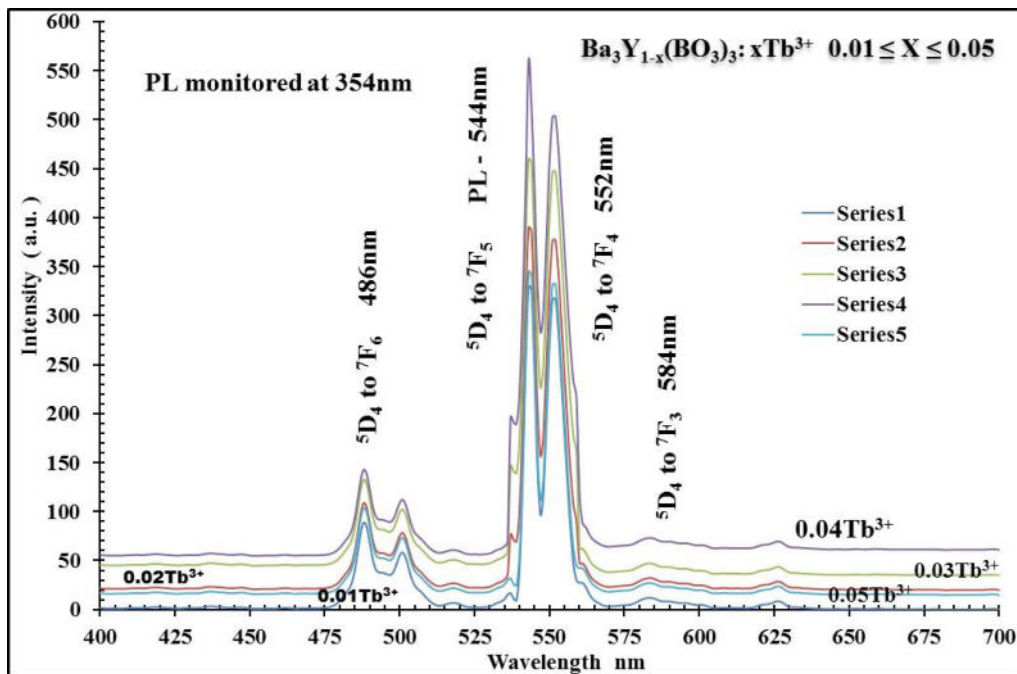


Figure 9. Photoluminescenceresults of $Ba_3Y_{1-x}(BO_3)_3: x Tb^{3+}$ monitored at 354nm.

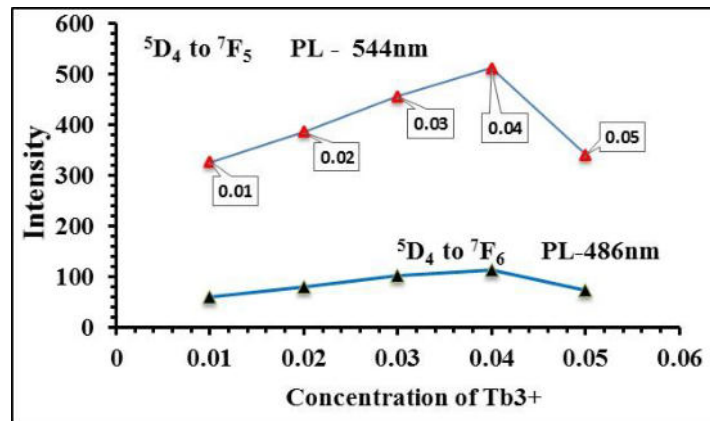


Figure 10. Concentration Quenching of $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3:x\text{Tb}^{3+}$ at 544nm & 486nm

3.5 1931-CIE-chromaticity: The CIE-diagram provides the quantitative connections in the visible electromagnetic spectrum between pure physical colours and perceived physiological colours in human colour vision. Using LED-TUNING-NL Software [<https://www.ledtuning.nl/en/cie-converter/>], chromaticity coordinates are computed. The coordinates of chromaticity are utilized in the 'GO-CIE' CIE plot utility programme designed by the IIT Roorkee 'OrganicMaterial Laboratory'. [<http://professorship.iitr.ac.in/~krjt8fcy/gocie.html>]. CIE Chromaticity co-ordinates for $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{Eu}^{3+}$ at PL wavelength 614nm are $X = 0.6774$, $Y = 0.3223$. It comes in red region of CIE Chromaticity diagram and is indicated by black triangle in figure 12. For $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{Tb}^{3+}$ at 544nm PL line chromaticity co-ordinates are $X = 0.2585$, $Y = 0.7305$. It is in green region of spectrum and is indicated by black triangle in figure 12. CIE- coordinates of synthesized phosphors lie on Wide Gamut RGB. For UV excitation light we got green and red luminescence as shown in figure 11.

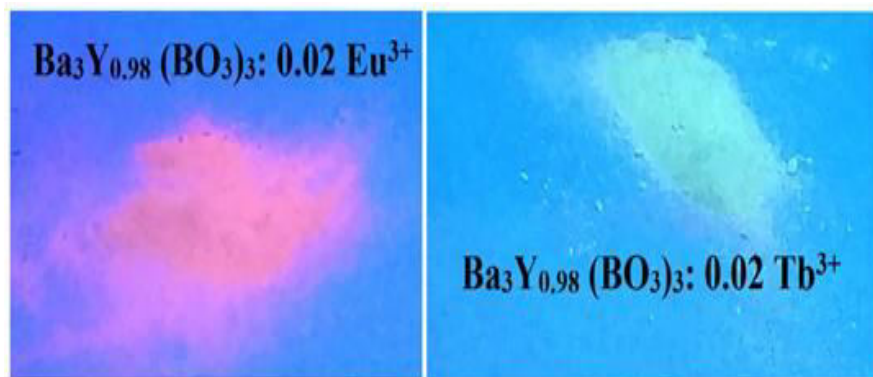


Figure 11 Luminescence photographs of $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3:0.02\text{Eu}^{3+}$ and 0.02Tb^{3+}

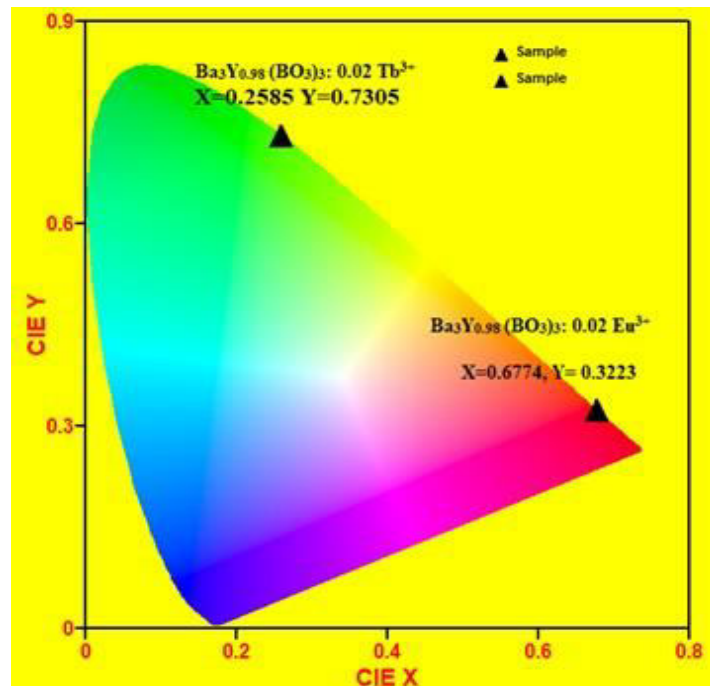


Figure 12 CIE-Chromaticity diagram of $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3: 0.02 \text{Eu}^{3+}$ and 0.02Tb^{3+}

The color quality of light in terms of ‘color correlated temperature (CCT)’ is given by the McCamy empirical formula [16].

$$\text{‘CCT} = -437n_3 + 3601n_2 - 6861n + 5514.31\text{’}$$

Where n is the ‘Inverse slope line’ having value, $n = (X - X_e) / (Y - Y_e)$. Here ‘(X, Y)’ are CIE-co-ordinates and ‘(X_e=0.332, Y_e=0.186)’ co-ordinates for epicenter. Lamps with CCT value below 3200K are considered as Warmth sources and having value more than 4000K are considered Cool sources of light in appearance. For $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3: 0.02\text{Eu}^{3+}$ phosphor CCT value is 4148 and for $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3: 0.02\text{Tb}^{3+}$ CCT value is 6515.

4. Conclusions: Using Solution combustion method synthesis of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ polycrystalline phosphor is achieved. XRD pattern matches with the standard JCPDS file no 51-1849 and ICSD file no 39744. “ $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x \text{Eu}^{3+}$ ” is NUV excited “Red emitting phosphor”. $\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x \text{Eu}^{3+}$ phosphor shows prominent luminescence for 614nm ascribed to electric dipole transition of $^5\text{D}_1 \rightarrow ^7\text{F}_2$. It happens only when Eu^{3+} occupy symmetry site in host crystal. Intrinsic absorption due to 4f-4f transitions is strong compared to CTB absorption at 234nm. $\alpha\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ host crystal partially allowed parity forbidden 4f-4f transition in Eu^{3+} ion having centro symmetric site occupancy. Due to Broad excitation band (312nm to 384nm) the material is useful in NUV excitation-based lighting applications. 1931-CIE- chromaticity co-ordinates for 614nm maximum emission line are $X = 0.6774, Y = 0.3223$.

$\text{Ba}_3\text{Y}_{1-x}(\text{BO}_3)_3: x\text{Tb}^{3+}$ is NUV excited green emitting phosphor. Photoluminescence excitation spectrum is broadband from 220 to 390nm with maximum intensity at 356nm (${}^7\text{F}_6 \rightarrow {}^5\text{D}_3: \text{Tb}^{3+}$). Luminescence is noted in almost green region with high intensity at 544nm (${}^5\text{D}_4 \rightarrow {}^7\text{F}_5$). 1931-CIE- chromaticity coordinates for 544nm high intensity emission line are $X=0.2585$, $Y=0.7305$. For both dopants Eu^{3+} , Tb^{3+} concentration quenching occurs at 4mole% resulting from electric multipolar interaction. Stokes's shift of $2340 \times 10^3 \text{cm}^{-1}$, $2225 \times 10^3 \text{cm}^{-1}$ shows that $\text{Ba}_3\text{Y}_{0.98}(\text{BO}_3)_3: 0.02\text{Eu}^{3+} \& \text{Tb}^{3+}$ phosphor produce less electron-phonon interaction and possess greater thermal stability. So, it may be the promising material for high power RGB-white light emitting diodes. $\text{Ba}_3\text{Y}(\text{BO}_3)_3: x\text{Eu}^{3+}$ and $x\text{Tb}^{3+}$ are quantum cutting phosphor at low temperature phase. We also suggest this material for white light emitting diodes base on color mixing.

5. References:

- [1] Chen, Lei; Lin, Chun-Che; Yeh, Chiao-Wen; Liu, Ru-Shi. 2010. "Light Converting Inorganic Phosphors for White Light-Emitting Diodes." *Materials* 3, 3: 2172-2195.
- [2] Xia, Zhiguo, Zihan Xu, Mingyue Chen, and Quanlin Liu. 2016 "Recent developments in the new inorganic solid-state LED phosphors." *Dalton transactions* 45, 28: 11214-11232.
- [3] Huang, Xiaoyong. 2014 "Red phosphor converts white LEDs." *Nature Photonics* 8, 10: 748-749.
- [4] Tsao, Jeff Y. 2004 "Solid-state lighting: lamps, chips, and materials for tomorrow." *IEEE Circuits and Devices Magazine* 20, 3: 28-37.
- [5] Dutta, Dimple P., and A. K. Tyagi. 2009 "Inorganic phosphor materials for solid state white light generation." *In Solid State Phenomena Trans Tech Publications Ltd*, 155, pp. 113-143.
- [6] Ye, S., F. Xiao, Y. X. Pan, Y. Y. Ma, and Q. Y. Zhang. 2010 "Phosphors in phosphor-converted white light-emitting diodes: Recent advances in materials, techniques and properties." *Materials Science and Engineering: R: Reports* 71, 1: 1-34.
- [7] Yuhua, W. A. N. G., Z. H. U. Ge, X. I. N. Shuangyu, W. A. N. G. Qian, L. I. Yanyan, W. U. Quansheng, W. A. N. G. Chuang, W. A. N. G. Xicheng, D. I. N. G. Xin, and G. E. N. G. Wanying. 2015 "Recent development in rare earth doped phosphors for white light emitting diodes." *Journal of Rare Earths* 33, 1: 1-12.
- [8] Basavaraj, R. B., H. Nagabushana, G. P. Darshan, B. Daruka Prasad, M. Rahul, S. C. Sharma, R. Sudaramani, and K. V. Archana. 2017. "Red and green emitting CTAB assisted $\text{CdSiO}_3: \text{Tb}^{3+}/\text{Eu}^{3+}$ Nano powders as fluorescent labeling agents used in forensic and display applications." *Dyes and Pigments* 147: 364-377.
- [9] Wang, De-Yin, Teng-Ming Chen, and Bing-Ming Cheng. 2012 "Host sensitization of Tb^{3+} ions in tribarium lanthanide borates $\text{Ba}_3\text{Ln}(\text{BO}_3)_3$ (Ln=Lu and Gd)." *Inorganic chemistry* 51, 5: 2961-2965.
- [10] Maggay, Irish Valerie B., and Wei-Ren Liu. 2018 "Novel red-emitting $\text{Ba}_3\text{Y}(\text{BO}_3)_3: \text{Bi}^{3+}, \text{Eu}^{3+}$ phosphors for N-UV white light-emitting diodes." *Journal of nanoscience and nanotechnology* 18, 1: 3-10.
- [11] Wu, Xiulan, Jinle Zheng, Qiang Ren, Wenni Bai, Yuhan Ren, and Ou Hai. 2019 "Synthesis and luminescent properties of a novel orange-red $\text{Ba}_3\text{Y}(\text{BO}_3)_3: \text{Sm}^{3+}$ phosphors for white LEDs." *Polyhedron* 164: 17-22.
- [12] Cheng, Zhiyuan, Jingjie Yu, Yanjie Zhang, and Nianyu Zou. 2017 "Luminescence and energy transfer mechanism of $\alpha\text{-Ba}_3\text{Y}(\text{BO}_3)_3: \text{Ce}^{3+}, \text{Tb}^{3+}$." *Journal of Luminescence* 192: 1004-1009.
- [13] Mimani, T., and K. C. Patil. 2001 "Solution combustion synthesis of nanoscale oxides and their composites." *Materials Physics and Mechanics (Russia)* 4, 2: 134-137.
- [14] Bajaj, N. S., and S. K. Omanwar. 2012 "Combustion synthesis and luminescence characteristic of rare earth activated LiCaBO_3 ." *Journal of Rare Earths* 30, 10: 1005-1008.
- [15] Qiao, Xuebin, and Hyo Jin Seo. 2015 "Phase transition, structural and spectroscopic properties of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ phosphor." *Journal of Alloys and Compounds* 637: 504-508.
- [16] Kasturi, Singh, R. Marikumar, and Sivakumar Vaidyanathan. 2018 "Trivalent rare-earth activated hexagonal lanthanum fluoride ($\text{LaF}_3: \text{RE}^{3+}$, where RE= Tb, Sm, Dy and Tm) nanocrystals: Synthesis and optical properties." *Luminescence* 33, 5: 897-906.

6. Acknowledgements: This work was supported by Physics Department, S.G.B.A.U. Amravati. We are Thankful to Head, Department of Physics S.G.B.A.U. for providing PLE-PL and XRD facility.

Photo-Luminescence study of $\text{Ba}_3\text{Gd}_{1-x}(\text{BO}_3)_3 : X \text{Ce}^{3+}$ phosphor

S. P. Hargunani¹, R. P. Sonekar¹, V. R. Panse², Marta Michalska-Domanskais³, N. S. Bajaj⁴

¹Department of Physics, G. S. College khamgaon, Dist: Buldana (M.S.), INDIA.

^{*2}Department of Physics, Late B.S.Arts Prof.N.G.Sci & A.G.Comm College Sakharkherda, India-443202

³ Institute of Optoelectronics, Military University of Technology, Poland.

⁴Department of Physics, Toshniwal Arts, Commerce & Science College

^{*2}Corresponding author's e-mail address: vshl.panse@gmail.com

Abstract

The polycrystalline powder sample of Ce^{3+} activated barium gadolinium borate phosphors $\text{Ba}_3\text{Gd}_{1-x}(\text{BO}_3)_3 : X \text{Ce}^{3+}$ ($0.01 \leq X \leq 0.06$) are prepared by solution combustion. Formation of phosphor in desired crystalline phase confirmed by powder XRD characterization & FTIR. A SEM image shows the irregular grains with average particle size $2.5\mu\text{m}$. The excitation spectrum consists of a single broad absorption band from 200 to 400 nm with the prominent excitation peak at 343 nm [$^2\text{F}_{5/2}$ to $^5\text{D}_1$ of Ce^{3+} ions]. Strongest emission peak of 488nm [$^5\text{D}_1 \rightarrow ^2\text{F}_{5/2}$] and weak of 501nm [$^5\text{D}_1 \rightarrow ^2\text{F}_{7/2}$] wavelength which is of blue light is observed at 343nm UV light excitation. $\text{Ba}_3\text{Gd}_{1-x}(\text{BO}_3)_3 : X \text{Ce}^{3+}$ phosphor emits blue light under UV excitation. Maximum PL emission takes place at 3 mole percentage of Ce^{3+} . Concentration quenching for Ce^{3+} ions is studied. Hence $\text{Ba}_3\text{Gd}_{1-x}(\text{BO}_3)_3 : X \text{Ce}^{3+}$ is new UV excited blue emitting phosphor useful for UV/Blue chip WLEDs.

Keywords

Borate phosphor, Photoluminescence, Red emission, W- LED.

1. Introduction

The syntheses of compounds $\text{M}_3\text{Ln}(\text{BO}_3)_3$ M =Sr, Ba and Ln=La–Lu, Sc, Y have been reported in recent past years [1]. The spectroscopic properties of vacuum ultraviolet and x-ray excited Ce^{3+} ion-activated $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ have been reported by Hong-bin Liang et.al. They studied luminescence properties of Ce^{3+} -doped barium gadolinium borate $\text{Ba}_3\text{Gd}(\text{BO}_3)_3:\text{Ce}^{3+}$ under vuv, uv, and x-ray excitations. $\text{Ba}_3\text{Gd}(\text{BO}_3)_3:\text{Ce}^{3+}$ is a poor x-ray phosphor. The dopant Ce^{3+} is slightly larger than Gd^{3+} but it will not distort the crystal lattice of $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ too seriously and is expected to replace Gd^{3+} ions [2]. $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ doped with Eu^{3+} ion was prepared by high temperature solid-state method and luminescence was studied by ZHOU Liya et.al. $\text{Ba}_3\text{Gd}(\text{BO}_3)_3:\text{Eu}^{3+}$ phosphor was effectively excited by the near ultraviolet (UV) light (396 nm) and blue light (466 nm). The main

emission peaks are at 611 and 616 nm , it was red emitting phosphor [3]. Cerium trivalent ion has only one 4f electron and only single discrete 4f energy level shielded by the completely filled 5S², 5P⁶orbital. General emission of Ce³⁺ has doublet character with wavelength difference approximately 40nm. Broad emission band is due to inter-configurationally 5d¹-4f¹ allowed transition of Ce³⁺. For blue luminescence Ce³⁺ ions is worthy to use in phosphors. For the important point of application, each proper mono-color-blue LED phosphor must meet the following necessary conditions. (1) The phosphor must show higher thermal stability. (2) The phosphor must efficiently absorb the 340nm - 400nm excitation energy. (3) The CIE coordinates of the phosphor are close to the NTSC standard values. BaMgAl₁₀O₁₇:Eu²⁺ (BAM) is one kind of reported commercial blue phosphor used in fluorescent lamps, because of its efficient blue emission [11]. Ca₂B₅O₉Cl:Eu²⁺, is another suitable Blue-Emitting Phosphor for n-UV Excited Solid-State Lighting [12]. Ca₂Pb₃(PO₄)₃Cl : Ce³⁺ is recently reported blue emitting lamp phosphor [13]. Sr_{1-x}Ca_xLu₂O₄:Ce³⁺ is blue phosphor for high CRI white LEDs [14-15].

2. Experimental

Phosphors were prepared by the solution combustion synthesis [4,5]. Stoichiometric amounts of high purity starting materials, Ba(NO₃)₂ (A.R.), H₃BO₃ (A.R.), CO(NH₂)₂ (A.R.), Gd(NO₃)₃.6H₂O (A.R.), Ce(NO₃)₃.6H₂O as given in table (1) are used for phosphor preparation. All chemicals from Merck of AR grade of (99.99%) purity. The starting materials with little amount of double distilled water were mixed thoroughly in agate mortar to obtain a homogeneous solution. Excess water was removed by heating the samples at temperature 100°C for about 30 min and the paste was then transferred directly to a pre-heated Muffle furnace, maintained at temperature 680°C, for combustion. Following the combustion, the resulting foamy samples was crushed to obtain fine particles and then annealed for 3 h at temperature 950°C. As prepared Borate phosphor material was characterized by powder XRD, SEM, PL and FT-IR techniques. Surface morphology and elemental analysis of the calcined powder sample was observed by scanning electron microscopy [SEM:Model JSM6100 (Jeol)].

Table 1 Merck -AR grade chemicals used for synthesis

Ba₃Gd_{0.97}(BO₃)₃ : 0.03 Ce³⁺					
Precursors	Ba(NO₃)₂	Gd(NO₃)₂	H₃BO₃	NH₂CONH₂	Ce(NO₃)₃.6H₂O
Molar ratio	3	0.96	3	7.45	0.04
Weight in gm	7.8405	1.08388	1.853	4.4744	0.194028

3. Results and Discussion

3.1. X-ray diffraction

Powder X-ray diffraction measurements of $\text{Ba}_3\text{Gd}_{0.970}0.03\text{Ce}^{3+}(\text{BO}_3)_3$ phosphor were taken on a Rigaku Miniflex II X-ray Diffractometer and compared with JCPDS No.(52-1327) as shown in figure 1-A. The maximum peaks matches with the standard pattern. The additional peaks are present in recorded pattern are due to impurities. Sharp peaks in XRD pattern are due to large crystallite size. X-ray pattern of $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ matches with the X-ray pattern of low temperature phase of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ [1,2]. Space group of phosphor $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ is $R\bar{3}(148)$ and cell parameters are $a = 13.06$, $c = 9.552$. $V = 1412.42 \text{ \AA}^3$. A detailed structure description of $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ was not found in literature. Bing Han *et al.* in his work mentioned that $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ is isomorphic with $H\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ for the following three reasons: (i) The powder XRD patterns of $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ and $H\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ are similar. (ii) The ionic radii of Gd^{3+} [$R_{\text{Gd(III)}}$] = 93.8 pm are close to that of Y^{3+} [$R_{\text{Y(III)}}$] = 90.0 pm in six fold coordination. (iii) It was found that the unit cell parameters [$a = 13.067(3) \text{ \AA}$, $c = 9.552(3) \text{ \AA}$, trigonal, $R\bar{3}$] of $\text{Ba}_3\text{Gd}(\text{BO}_3)_3$ are similar with that [$a = 13.028(2) \text{ \AA}$, $c = 9.4992(2) \text{ \AA}$, trigonal, $R\bar{3}$] of $H\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ [2]. In a high temperature phase, a $H\text{-Ba}_3\text{Y}(\text{BO}_3)_3$ with a trigonal system having a space group of $R(3)$, $Z = 6$, which consists of YB_6O_{18} unit with polyhedral of BaO_6 and BaO_8 as shown in figure 1-B [16].

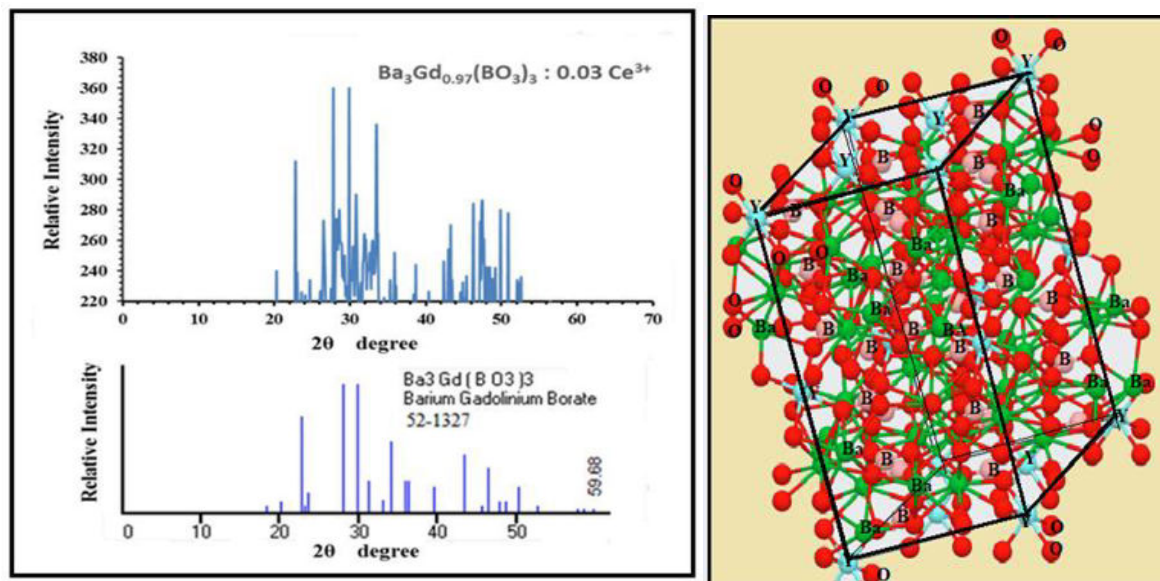


Figure 1-A:XRD-pattern of sample 1-B:Structural unit of $\text{Ba}_3\text{Y}(\text{BO}_3)_3$ with six fold coordination of Y^{3+} ions [17]

3.2. SEM

SEM study was carried out to examine the surface morphology of the prepared phosphor. The SEM images of $\text{Ba}_3\text{Gd}_{1-0.03}(\text{BO}_3)_3:0.03\text{Ce}^{3+}$ phosphors are shown in Figure 2. It was

observed that the microstructure of the phosphor consist of irregular grains with agglomerate phenomena. The average size of synthesized phosphor particles is about 50 μm . The results show that phosphors have a good crystallinity and a relatively low sinter temperature. Average crystalline size by Scherrer formula is in 42.2 nm, which is nearly same as seen in surface morphology. SEM shows the image of polycrystalline particles and XRD measurements reflect the crystalline domain size. It indicates that solution combustion synthesized phosphor has sharp surface morphology as well as crystalline grains.

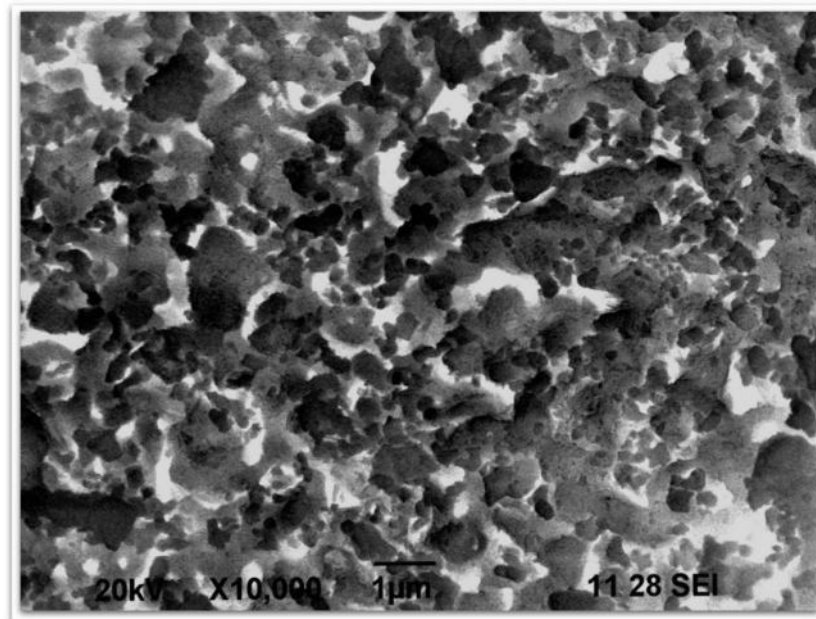


Figure 2: SEM Image of phosphor host.

3.3. PL and PLE Study

The PLE of $\text{Ba}_3\text{Gd}_{0.97}(\text{BO}_3)_3 : 0.03\text{Ce}^{3+}$ phosphor is shown in figure (3). It is recorded on F-7000 FL spectrophotometer with scan speed 240 nm/min, excitation-emission slit width 1nm. Ce^{3+} is all-round candidate for phosphor materials and it does not have any 4f-4f transition. It shows only 4f-5d type inter configurationally transition in borate host [8,9,10]. Photoluminescence excitation is broad band in region 240nm to 400nm with shoulder peak at 343nm due to transition from $^2\text{F}_{5/2}$ to $^5\text{d}_1$ level of activator ion in host lattice.

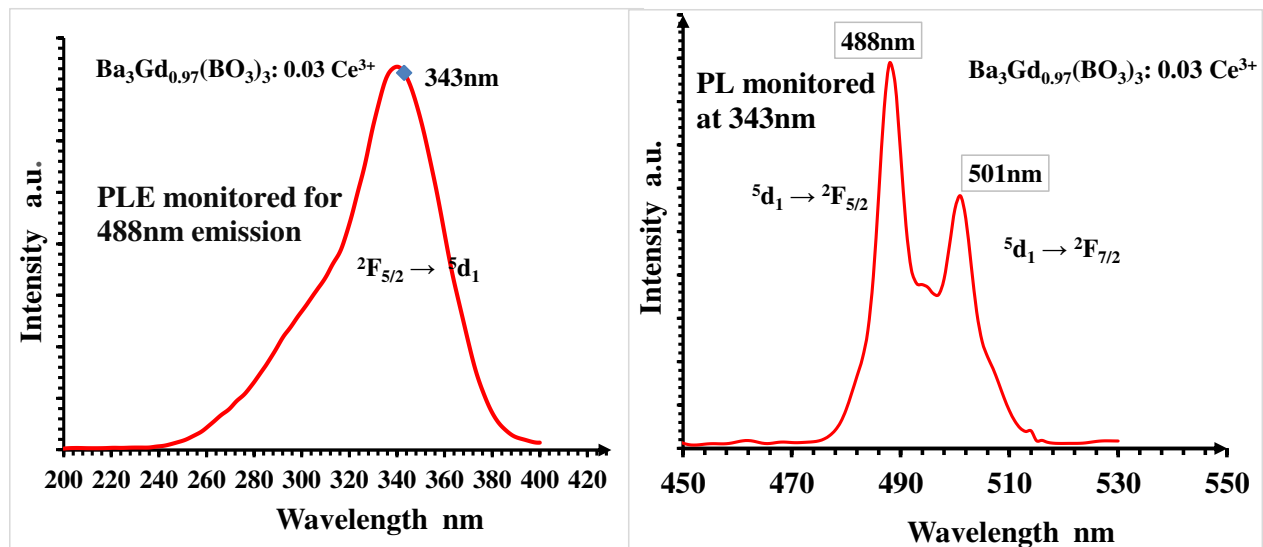


Figure 3 PLE of $Ba_3Gd_{0.97}(BO_3)_3 : 0.03 Ce^{3+}$ **Figure 4** PL of $Ba_3Gd_{0.97}(BO_3)_3 : 0.03 Ce^{3+}$

The PL of $Ba_3Gd_{0.97}(BO_3)_3 : 0.03 Ce^{3+}$ phosphor monitored at 343nm excitation is shown in figure (4). PL recorded in range 450nm to 530nm shows two peaks at 488nm and 501nm. 488nm peak is due to 5d_1 to $^2F_{5/2}$ and 501nm peak is due to 5d_1 to $^2F_{7/2}$ transition of activator in crystal environment. Ce^{3+} ion shown the two characteristic lines. Intensity of 501nm is less than 488nm line. 488nm lies in blue region of spectrum. So it is NUV excited blue emitting phosphor. The photoluminescence study is carried out at room temperature.

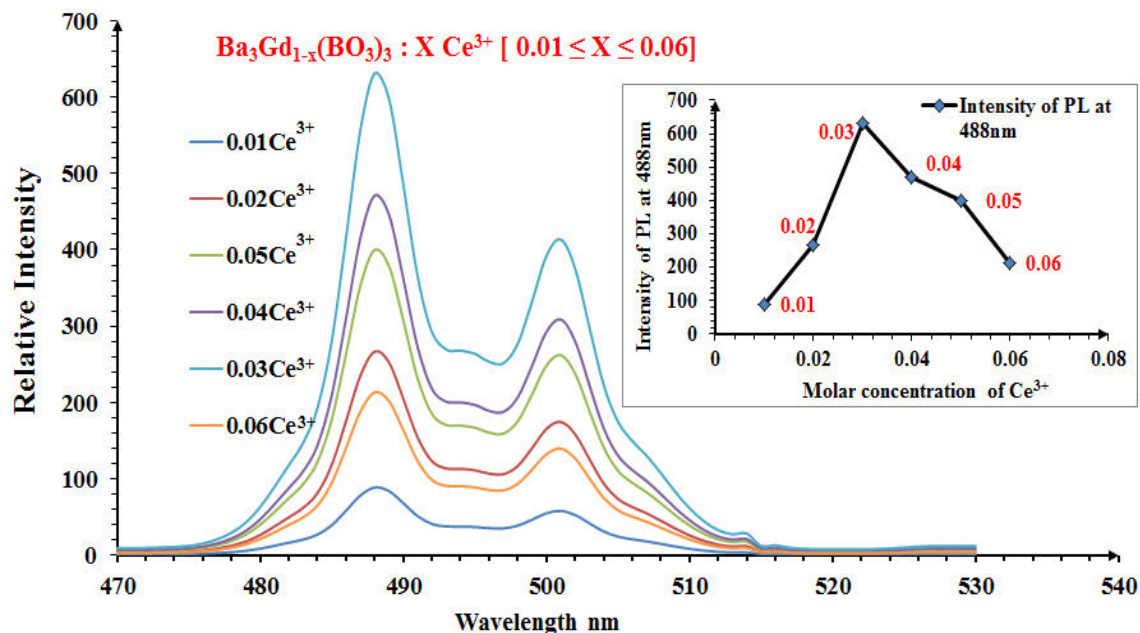


Figure 5 PL of host phosphor at different concentration of dopant Ce^{3+} And embedded Concentration quenching Curve

3.4. CIE Chromaticity Diagram of $Ba_3Gd_{0.97}(BO_3)_3 : 0.03 Ce^{3+}$

Figure (6) shows the Commission International del Eclairage (CIE) chromaticity coordinates diagram of the $Ba_3Gd_{0.97}(BO_3)_3 : 0.03 Ce^{3+}$ phosphor at 488nm. The chromaticity coordinates of the phosphor $Ba_3Gd_{0.97}(BO_3)_3 : 0.03Ce^{3+}$ for fixed concentration of Ce^{3+} at 488 nm was computed using LEDTUNING. NL Software [<https://www.ledtuning.nl/en/cie-convertoor>][11-12-13]. CIE Chromaticity co-ordinates for $Ba_3Gd_{0.97}(BO_3)_3 : 0.03Ce^{3+}$ at PL wavelength 488nm are $X = 0.05467$, $Y = 0.2541$. It comes in blue region of CIE Chromaticity diagram and is indicated by black circle in figure(6). CCT value is 122321 kelvin and Delta uv is 0.1402.

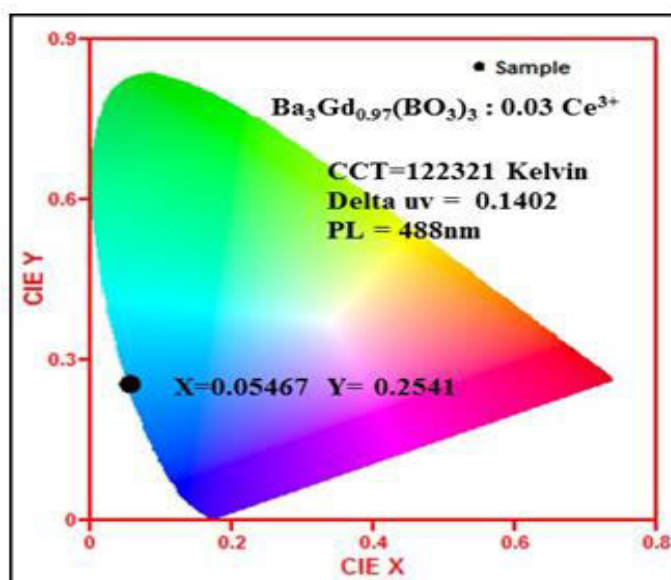


Figure 6 CIE chromaticity of $Ba_3Gd_{0.97}(BO_3)_3 : 0.03 Ce^{3+}$

4. Conclusions

The $Ba_3Gd_{1-x}(BO_3)_3 : X Ce^{3+}$ polycrystalline phosphor was synthesized by solution combustion method. XRD confirmed the phase & formation of compound and it matches with standard JCPDS file number 52-1327. SEM shows the average size of synthesized phosphor particles was about 2.5 μm and good crystalline. Phosphor shows broad excitation band from 200 to 400 nm with prominent peak at 343 nm. PLE for characteristic emission wavelength 488 nm was found to be 343 nm. At 343 nm, UV light excitation $Ba_3Gd_{1-x}(BO_3)_3 : X Ce^{3+}$ phosphor emits blue light.

Acknowledgements

Author S.P.Hargunani is thankful to the Chairman of FIST-DST project SGB Amravati University Amravati, for providing XRD facility to this work and also thankful to Dr. R.P. Sonekar, Head Physics Dept., Dr. D S Talwankar, Head research center, G.S. Science, Arts and Commerce College Khamgaon, for providing synthesis facility.

References

1. Wang, De-Yin, Teng-Ming Chen, and Bing-Ming Cheng. *Inorganic chemistry* 51, no. 5 (2012): 2961-2965.
2. Han, Bing, Hong-bin Liang, Hui-hong Lin, Jiu-ping Zhong, Qiang Su, Pieter Dorenbos, M. DanangBirowosuto, Guo-bin Zhang, and Yi-bing Fu. *Journal of applied physics* 101, no. 11 (2007): 113530.
3. Liya, Zhou, Junli Huang, Yi Linghong, Gong Menglian, and Shi Jianxin. *Journal of Rare Earths* 27, no. 1 (2009): 54-57.
4. Simura, Rayko, TatsushiYagi, Kazumasa Sugiyama, Takayuki Yanagida, and Akira Yoshikawa. "*Journal of crystal growth* 362 (2013): 145-148.
5. Pan, Shangke, Jianyu Zhang, and Jianguo Pan. *Optical Materials* 76 (2018): 178-183.
6. Palaspar, R. S., R. P. Sonekar, and S. K. Omanwar. *AIP Conference Proceedings*, vol. 1536, no. 1, pp. 807-808. American Institute of Physics, 2013.
7. Hargunani, S. P., R. P. Sonekar, HarmanpreetKaur, J. G. Mahakhode, and Samikha B. Dhoble. "Combustion synthesis of Ba₃Y_{1-x}Sm₃₊ x (BO₃)₃ as red-light emitting phosphors for indoor plant cultivation applications." In *Journal of Physics: Conference Series*, vol. 1913, no. 1, p. 012016. IOP Publishing, 2021..
8. Hargunani, Sanjay P., Rajkumar P. Sonekar, Ritesh S. Palaspar, PranitaPatil, and Shriniwas K. Omanwar. *Macromolecular Symposia*, vol. 387, no. 1, p. 1800184. 2019.
9. X. Zhang and M. Gong, *Industrial & Engineering Chemistry Research ACS*, vol. 54, p. 7632–7639, 2015.
10. JiayueSuna, YiningSuna, J. Lai, Z. Xiab and HaiyanDua, *Journal of Luminescence*, vol. 132, no. 11, pp. 3048-3052, November 2012,.
11. Wang, Z. L., KokWaiCheah, Hoi Lam Tam, and M. L. Gong. *Journal of Alloys and Compounds* 482, no. 1-2 (2009): 437-439.
12. Zhang, Xinmin, Hong Chen, Weijia Ding, Hao Wu, and Jongsu Kim. *Journal of the American Ceramic Society* 92, no. 2 (2009): 429-432.
13. Panse, V. R., and S. J. Dhoble. *Optik* 219 (2020): 165107.
14. Zhou, Yipeng, Yunsheng Hu, Ronghui Liu, Yuanhong Liu, WeidongZhuang, Min Cao, TongyuGao, JunhangTian, Yanfeng Li, and Guantong Chen. *Journal of Rare Earths* (2020).
15. N.S.Kokode, V.R.Panse, S.J.Dhoble, J.of advanced material letter 2015,6(7),616-619.

16. Wang, De-Yin, Teng-Ming Chen, and Bing-Ming Cheng. "Host sensitization of Tb³⁺ ions in tribarium lanthanide borates Ba₃Ln (BO₃)₃ (Ln= Lu and Gd)." *Inorganic chemistry* 51, no. 5 (2012): 2961-2965.
17. Qiao, Xuebin, and Hyo Jin Seo. "Phase transition, structural and spectroscopic properties of Ba₃Y (BO₃)₃ phosphor." *Journal of Alloys and Compounds* 637 (2015): 504-508.
18. Hargunani, Sanjay Prakash, RajkumarPandurangSonekar, Anoop Singh, AjitKhosla, and SandeepArya. "Structural and spectral studies of Ce³⁺ doped Sr₃Y (BO₃)₃ nano phosphors prepared by combustion synthesis." *Materials Technology* (2020): 1-12.

Peer Reviewed Refereed and
UGC Listed Journal
(Journal No. 40776)

ISSN 2277 - 5730
AN INTERNATIONAL MULTIDISCIPLINARY
QUARTERLY RESEARCH JOURNAL



AJANTA



Education

Volume - XI, Issue - I,
January - March - 2022
Marathi Part - I / II

Impact Factor / Indexing
2020 - 6.306
www.sjifactor.com



**Ajanta
Prakashan**

ISSN 2277 - 5730
AN INTERNATIONAL MULTIDISCIPLINARY
QUARTERLY RESEARCH JOURNAL

AJANTA

Volume - XI

Issue - I

January - March - 2022

MARATHI PART - I / II

Peer Reviewed Refereed
and UGC Listed Journal

Journal No. 40776



ज्ञान-विज्ञान विमुक्तये

IMPACT FACTOR / INDEXING

2020 - 6.306

www.sjifactor.com

❖ EDITOR ❖

Asst. Prof. Vinay Shankarrao Hatole
M.Sc (Maths), M.B.A. (Mktg.), M.B.A. (H.R.),
M.Drama (Acting), M.Drama (Prod. & Dir.), M.Ed.

❖ PUBLISHED BY ❖

Ajanta Prakashan
Aurangabad. (M.S.)

❧ CONTENTS OF MARATHI PART - II ❧

अ.क्र.	लेख आणि लेखकाचे नाव	पृष्ठ क्र.
१	म. गांधी व डॉ. बाबासाहेब आंबेडकर यांचा राष्ट्रवाद : एक तुलनात्मक अभ्यास उज्ज्वला प्रभाकरराव पांगरकर	१-७
२	छत्रपती शिवाजी महाराजांची सैन्य व्यवस्था प्रा. भावसार जे. आर.	८-९
३	औरंगाबाद जिल्ह्यातील खालेव विद्यार्थ्यांच्या शारीरिक क्षमता घाबऱ्यांची मानके ठरविणे श्री. मधुकर पांडुरंग वाकळे डॉ. मकरंद श्रीकृष्ण जोशी	१०-१५
४	जागतिक राजकारणात भारताचे स्थान व भूमिका डॉ. प्रतिभा टावरी	१६-२०

४. जागतिक राजकारणात भारताचे स्थान व भूमिका

डॉ. प्रतिभा टावरी

सहयोगी प्राध्यापक, राज्यशास्त्र विभाग प्रमुख, गो.से. महाविद्यालय खामगाव, जि. बुलढाणा.

प्रस्तावना

भारत स्वातंत्र्याच्या अमृतमहोत्सवी वर्षात पदार्पण करित आहे. या ७५ वर्षांच्या कालावधीत भारताने जागतिक राजकारणात महत्वाची भूमिका वाढविली आहे. भारतीय स्वातंत्र्यानंतर भारताला अंतर्गत धोरणाप्रमाणेच परराष्ट्र धोरणाची नियोजनबद्ध आखणी करणे आवश्यक होते. भारताच्या परराष्ट्र धोरणाची बांधणी केवळ राष्ट्रीय हितसंबंधाच्या संरक्षणापुरतीच नव्हती तर आंतरराष्ट्रीय राजकारणात भारताला महत्वपूर्ण भूमिका पार पाडता यावी आणि विकसनशील राष्ट्रांचे नेतृत्व करण्यास भारत सक्षम असावा या दिशेने परराष्ट्र धोरणाचे आकृतिबंध तयार करण्यात आले. भारताच्या स्वातंत्र्यापासूनच भारताच्या सर्वांच्च नेतृत्वाने, परराष्ट्र मंत्रालयाने परराष्ट्र धोरणाला नवीन दिशा देण्याचा वेळोवेळी प्रयत्न केला. प्रस्तुत शोधनिबंधात स्वातंत्र्यापासून तर आजपर्यंत जागतिक राजकारणात भारताची भूमिका व स्थान यांसंबंधी संक्षिप्त आढावा घेण्यात आला आहे.

शोधनिबंधाचे उद्दिष्टे

१. स्वातंत्र्योत्तर भारताच्या परराष्ट्र धोरणाचे अध्ययन करणे.
२. जागतिक राजकारणात भारताची भूमिका व स्थान यांचे अध्ययन करणे.

गृहितके

१. नेहरूकालीन भारताचे परराष्ट्र धोरण आदर्शवादी होते.
२. शीतयुद्धोत्तर कालखंडात भारताचे परराष्ट्र धोरण वास्तववादी बनले.
३. भारताने जागतिक राजकारणात स्वातंत्र्यापासूनच महत्वाची भूमिका वाढविली.
४. मोदी सरकारने परराष्ट्र धोरणाच्या क्षेत्रात तुलनात्मकदृष्ट्या सर्वात भरीव कामगिरी केली.

शीतयुद्धकालीन कालखंड

स्वातंत्र्य प्राप्तीचा काळ हा अमेरिका व रशिया या दोन महासत्तेतील शीतयुद्धाचा काळ होता. पं. नेहरूंचे परराष्ट्र धोरण हे शीतयुद्धाच्या काळात विकसित झाले. त्यामूळे शीतयुद्धाच्या राजकारणाचा प्रभाव नेहरूंच्या परराष्ट्र धोरणावर जाणवतो. तसेच शांतता, अहिंसा, मानवतावाद, बंधुभाव, शांततापूर्ण सहजीवन, साम्राज्यवाद वसाहतवादाचा विरोध या भारतीय तत्वाज्ञानातील नैतिक तत्वांचा नेहरूंवर प्रभाव होता. नेहरूंच्या या आदर्शवादी विचारांच्या प्रभावाने पंचशीलतत्त्वे भारताच्या शीतयुद्धकालीन परराष्ट्र धोरण पायाभूत तत्त्वे धोरणाची बनली.

Aayushi International Interdisciplinary Research Journal (AIIRJ)

Peer Reviewed And Indexed Journal

ISSN 2349-638x

Impact Factor 7.149

Website :- www.aiirjournal.com

Theme of Special Issue

Health And Human Rights

(Special Issue No.101)

Chief Editor

Mr. Pramod P. Tandale

Executive Editor

Sandeep Tundurwar

HoD, Political Science
Shri Binzani City College, Nagpur

Dr. Sharad Sambare

HoD, Political Science
Yashoda Girls' Arts & Commerce College, Nagpur

Co-Editor

Dr. Nageshwar Kanhake

HoD, Political Science
Savitribai Phule Mahila Mahavidyalya, Washim

Dr. Vakil Sheikh

HoD, Political Science
Taywade Arts, Commerce & Science, Koradi

Dr. Ram Butale

HoD, Political Science
Arts College, Bori Arab, Yavatmal

Dr. Rayan Mahajan

Shri Binzani City College, Nagpur



Sr. No.	Name of the Author	Title of Paper	Page No.
17.	डॉ. प्रतिभा टावरी	मानवाधिकाराच्या संदर्भात डॉ. अभय बंग व डॉ. राणी बंग यांचे सार्वजनिक आरोग्य क्षेत्रातील योगदान	70
18.	डॉ. रविंद्र भणगे	आरोग्य : एक मानवी अधिकार	76
19.	डॉ.दर्शना दि.वरगंटीवार प्रा.दिनेश वरगंटीवार	संक्रामक व्याधी आणि व्याधीक्षमत्त्व	83
20.	डॉ. भारत एम. राठोड	मानवाधिकार : आदिवासी महिला व बालकांचे आरोग्य	86
21.	डॉ.नितीन दादाराव गौरखेडे	बाल श्रमिक आणि मानवी अधिकार	91
22.	डॉ. रायन त्र्यंबकराव महाजन डॉ. नितीन सु. कायरकर	भारतीय समाजव्यवस्थेपुढील कुमारी मातांचा प्रश्न	94
23.	डॉ. व्ही. के. गायकवाड	आरोग्य विषयक शासकीय धोरणे आणि मानवी हक्क	97
24.	डॉ. संजय गोरे	आरोग्यविषयक महात्मा गांधींचा दृष्टीकोण	100
25.	डॉ. दिनकर रामेश्वर चौधरी	आरोग्य विषयक गांधीजींचा दृष्टीकोण	103
26.	डॉ. नंदाजी आर. सातपुते	महात्मा गांधी आणि ग्राम आरोग्याची संकल्पना	105
27.	डॉ. संतोष संभाजी डाखरे प्रा. मनोज सरोदे	महात्मा गांधी यांचे आरोग्यविषयक विचार	107
28.	एन आर कल्हाटे	मानवतावादी चेहरा देण्याकरीता वैद्यकीय क्षेत्राचे योगदान	110
29.	डॉ. विठ्ठल ल. मदुलवार	भारतातील मानवाधिकाराना विकास व आरोग्य विषयक सुधारणा	112
30.	डॉ. राष्ट्रपाल गणवीर	भारतीय आरोग्य धोरण व आरोग्य सुविधा	115
31.	डॉ. संदीप बी. काळे	मानसिक आरोग्य आणि मानवी हक्क	120
32.	डॉ. राजेंद्र सदाशिव मुद्दमवार	आरोग्य विषयक तरतुदी आणि मानवाधिकार	124

मानवाधिकाराच्या संदर्भात डॉ. अभय बंग व डॉ. राणी बंग यांचे सार्वजनिक आरोग्य क्षेत्रातील योगदान

डॉ. प्रतिभा टावरी,
राज्यशास्त्र विभाग प्रमुख,
गो.से. विज्ञान, कला व वाणिज्य महाविद्यालय, खामगांव जि. बुलढाणा

प्रस्तावना

डॉ. अभय बंग व डॉ. राणी बंग गेल्या ३२ वर्षांपासून आदिवासी बहुल असलेल्या गडचिरोली सारख्या दुर्गम भागात ग्रामीण भागातील आदिवासी, महिला व मुले यांच्यासाठी निष्काम आरोग्यसेवा देत आहे. मानवतावादी बंग दाम्पत्याने ग्रामीण जीवन निरोगी, निरामय करण्यासाठी, खेड्यांना आरोग्याच्या दृष्टिने सक्षम करण्यासाठी त्यांची कर्मभूमी असलेल्या गडचिरोली जिल्ह्यात शोधग्राम वसविले व सर्च नावाची स्वयंसेवी संस्था स्थापन केली. सर्व संस्थेतून सार्वजनिक आरोग्याच्या क्षेत्रात त्यांनी अभिनव संशोधन व प्रयोग केले. त्यांच्या या संशोधनाची दखल राज्य, राष्ट्रीय व जागतिक स्तरावर घेण्यात आली व या तीनही स्तरावर त्यांचे संशोधन आरोग्यविषयक धोरणात्मक बदल घडवून आणणारे ठरले. त्यांच्या संशोधनाचा स्वीकार करून त्याचे यशस्वी प्रयोग राज्य, राष्ट्र व जगातील अनेक देशात केल्या गेले व केल्या जात आहे. सार्वजनिक आरोग्याच्या क्षेत्रात अभिनव संशोधनाबरोबरच डॉ. अभय बंग यांनी आपले विचार व कल्पना मांडायला अभिनव संकल्पनेला जन्म दिला. नवनविन शब्दांची रचना केली. आरोग्य स्वराज्य, शोधग्राम, आरोग्य दुत, कोवळी पानगळ, दारूमुक्ती, मद्यराष्ट्र, अणुविसर्जन, क्षणस्थ या हृदस्पर्शी आठ शब्दातून डॉ. अभय बंगचा मानवतावादी दृष्टीकोन दिसून येतो.

प्रस्तुत शोध निबंधात या संकल्पना व शब्दांचा अर्थ स्पष्ट करण्यात आला आहे. बंग दाम्पत्यांनी ग्रामीण आरोग्यविषयक समस्यांचा घेतलेला शोध व त्यांच्या निराकरणाकरिता केलेल्या प्रत्येक संशोधनावर स्वतंत्र शोधप्रबंध होतो. परंतु त्यांच्या संशोधन व कार्याचे एकंदरीत स्वरूप व व्याप्ती स्पष्ट करण्याचे उद्दिष्ट समोर ठेऊन आणि शोधनिबंधाच्या शब्दमर्यादा लक्षात घेऊन त्यांच्या संशोधन व कार्याचा संक्षिप्त कृतीपट प्रस्तुत शोधनिबंधात मांडला आहे.

संशोधनाचे उद्दिष्ट :-

१. खेड्याचे आरोग्य सुधारण्यासाठी बंग दाम्पत्यांनी केलेले संशोधन व कार्य याचे अध्ययन करणे.
२. त्यांच्या संशोधन व कार्याचे स्वरूप व व्याप्तीचे विवेचन करणे.
३. डॉ. अभय बंग यांनी ग्रामीण सार्वजनिक आरोग्य क्षेत्रात आणलेल्या नवीन संकल्पना व शब्दांचा अर्थ स्पष्ट करणे.

गृहीतके :-

१. आधुनिक जीवनशैली मुळे लोकांना आरोग्यविषयक जागरूक करणे, सक्षम करणे आवश्यक आहे.
२. लोकसहभागातून आरोग्य विषयक समस्यांचे निराकरण करता येते, आरोग्यदायी समाज 'आरोग्य-स्वराज्य' तून साध्य करता येते.

आरोग्य स्वराज्य - सन १९८४ मध्ये अमेरिकेतील जॉन्स हॉपकिन्स विद्यापीठातून मास्टर्स इन पब्लिक हेल्थ ही पदवी सुवर्णपदकासह घेऊन बंग दाम्पत्य भारतात आले. तेव्हा मोठ मोठ्या संधी त्यांना चालून आल्या होत्या. पण त्यांनी खेड्याचे आरोग्य सुधारण्याचे ध्येय निश्चित केले. ध्येय गाठण्याकरिता नियोजनाचा विचार करित असतानाच त्यांची भेट म. गांधी चे नातू राम गांधी यांच्याशी दिल्लीच्या गांधी शांति प्रतिष्ठाण मध्ये झाली. त्यांनी डॉ. बंग यांना आरोग्याचा भारतीय अर्थ काय? असा प्रश्न विचारला व उत्तरही दिले, जो स्व मध्ये स्थित आहे तो स्वस्थ, म्हणजेच जो दुसऱ्यावर अवलंबून आहे तो अ-स्व-स्थ. डॉ. बंग यांना आरोग्याचा खरा अर्थ गवसला. स्वास्थ म्हणजे स्वावलंबन.

स्वास्थ्य म्हणजे आत्मनिर्भरता. स्वास्थाचा शोध केवळ उपचाराचा शोध नाही तर आरोग्यासाठी सक्षम करण्याचा शोध आहे. अशा विचारमंथनातून डॉ. अभय बंग यांना संकल्पना सुचली, 'आरोग्य – स्वराज्य'. जोपर्यंत खेड्यातले लोक स्वतःचं आरोग्य सांभाळायला शहरांवर, रूग्णालयांवर, डॉक्टरांवर अवलंबून आहेत तोपर्यंत ते स्वस्थ नाहीत. 'व्यक्ती आणि समुदायाला त्यांच्या स्तःच्या आरोग्याची जबाबदारी घेण्यास सक्षम बनविणे जेणेकरून त्याद्वारे त्यांना आजार तसेच निर्भरतेपासून मुक्तता मिळेल'. म्हणजे आरोग्य स्वराज्याने अशी व्याख्या डॉ. अभय बंग ने केली आहे.

म. गांधीनी, ग्राम – स्वराज्य ची संकल्पना मांडली होती. खेडी समृद्ध व आत्मनिर्भर व्हायला हवी असा ग्राम स्वराज्याचा अर्थ आहे. आरोग्य स्वराज्य ही संकल्पना ग्राम स्वराज्य ला जवळची आहे. बंग दाम्पत्याच ध्येय ठरलं. आरोग्य स्वराज्य ची स्थापना करण्याचं. गडचिरोलीतून स्थापन केलेल्या शोधग्राम व सर्व संस्थेतून आरोग्य स्वराज्य ची वाटचाल सुरु झाली.

सेवाग्राम ते शोधग्राम :-

खेडी समृद्ध व आत्मनिर्भर व्हावी याकरिता संपूर्ण जीवन समर्पित केलेले गांधी विचारांचे प्रा. ठाकुरदास बंग व सुमन बंग या दाम्पत्याच्या पोटी डॉ. अभय यांचा जन्म झाला. सेवाग्राम आश्रमात त्यांचे लहानपण गेले. गांधी विचारांच्या नवीन तालीम पद्धतीने सुरु झालेल्या शाळेत डॉ. अभय बंग यांचे प्राथमिक शिक्षण झाले. प्रा. ठाकुरदास बंग यांचं संपुर्ण कुटूंब गांधी विचाराने प्रेरित झालेलं होत. आणि गांधी विचारांच्या कृतीपथावर चालत होत, चालत आहे. लहानपणी डॉ अभय १३ वर्षांचे असतांना व त्यांचे ज्येष्ठ बंधु अशोक १६ वर्षांचे असताना मानवी सेवे साठी दोघांनी आपआपली क्षेत्रे निवडली. अशोक यांनी कृषीक्षेत्र तर अभय यांनी वैद्यकीय क्षेत्र. निरागस व अबोध वयात सहज गप्पामध्ये ठरविलेली ही क्षेत्रे पुढे आयुष्यात दोघांनी भावांची कर्मभूमी झाली. दोघांनीही आपआपल्या क्षेत्रात संशोधनाचे किर्तिमान स्थापीत केले व जनसेवा केली. डॉ. अभय यांची पत्नी डॉ राणी चारी यांचा चंद्रपुर जिल्ह्यात दक्षिण भारतीय कुटुंबात जन्म झाला. डॉ. अभय व डॉ. राणी यांनी गव्हर्नमेंट मेडीकल कॉलेज, नागपूर येथून एम.बी. बी.एस व एम.डी. ची पदवी घेतली. १९७८ मध्ये दोघांनी वर्धा येथील चेतना विकास संस्थेतून समाजकार्याची सुरुवात केली. चेतना विकास संस्था वर्धा जिल्ह्यातील ग्रामीण जीवनाचा सर्वांगीण विकास करण्याकरिता कार्य करते. ही संस्था डॉ. अभय बंगच्या मातोश्री सुमन बंग यांनी स्थापन केली आहे. १९७८ मध्ये वैद्यकीय सेवेची सुरुवात डॉ अभय व डॉ. राणी यांनी वर्धा जवळील कान्हापूर या गावातून केली. १९७० – ८० या दशकात अनेक सामाजिक संघटनांना भेटी दिल्या. लोककल्याणकारी कार्य व चळवळी केल्या. रोजगार हमी योजनाचे फायदे मिळवून देण्यासाठी उभारलेल्या चळवळीच्या यशातून डॉ अभय यांच्या लक्षात आलं की, निव्वळ सेवेने समाज बदलत नाही. बौद्धिक कुवत व ज्ञानाची जोड देण्याची गरज असते. त्यांच्या हेही लक्षात आलं की, रोगांचं मुळ आपल्या देशात आहे, मात्र त्यांचं संशोधन विदेशात होत आहे. त्यामुळे त्यांनी संशोधनाची पद्धत शिकावी असे त्यांना वाटले. याकरिता सार्वजनिक आरोग्याचं शिक्षण घेण्याचं डॉ बंग दाम्पत्यांनी ठरवलं. यासाठी एक वर्षासाठी १९८४ ला ते अमेरिकेत गेले. शिक्षण घेऊन भारतात परतले. वैद्यकीय सेवेसाठी शहर निवडाव की खेडं या विवंचनेत असतांना त्यांचे वडिल प्रा. ठाकुरदास बंग यांना गांधीजींनी सांगितलेले वाक्य त्यांना आठवले 'संशोधन करायचे असेल तर खेड्यात जा' या वाक्याची प्रेरणा बंग दाम्पत्यांना १९८६ ला गडचिरोलीत घेऊन गेली.

ग्रामीण जीवन आरोग्य संपन्न करण्याकरिता पहिली पायरी होती खेड्यातील आरोग्यविषयक समस्यांचा शोध घेण्याची यासाठी गडचिरोलीच्या जंगलात नव्याने वसलेल्या वस्तीला काय नाव द्यायचं ? हा प्रश्न डॉ. अभय बंग यांना पडला, गांधीजींनी आपल्या आश्रमाला नाव दिलं होत. 'सेवाग्राम' म्हणजेच सेवेचं गाव, सेवा करणार गाव, डॉ. अभय बंगला नाव सुचलं 'शोधग्राम' इथे संस्कृती हवी सेवेतून शोधाची. आता पर्यंतच्या जिवन कार्यातून डॉ. अभयला हे उमगलं होतं की, निव्वळ सेवेने खेडी सक्षम होत नाहीत तर सेवेला शोधाची जोड द्यावी लागते. शोधग्रामचा निर्मितीकरिता बंग दाम्पत्यांनी आदिवासींशी चर्चा केली. आदिवासींना दवाखान्याची भिती वाटते, नर्सचा पांढऱ्या कपड्यांची भिती वाटते हे त्यांना कळले, आदिवासींना आपलासा वाटावा म्हणून त्यांचा मनाप्रमाणे, त्यांचा सहभागातून

घोटूल पद्धतीने झोपड्याचं रूग्णालय उभ राहिलं. आदिवासींना हवे असलेले नाव दिलं. मां दत्तेश्वरी दवाखाना. आदिवासींच्या सहभागातून गडचिरोली पासून १७ किमी. दुर धानोरा मार्गावर शोधग्राम साकारलं.

इ.स. १९८८ साली बंग दाम्पत्यांनी सर्च नावाची बिगर सरकारी संघटना ५८ गावातील ४८ हजार लोकांसाठी स्थापन केली सोयायटी फॉर एजुकेशन, अॅक्शन अॅंड रिसर्च इन कम्युनिटी हेल्थ 'मल्ल' 'सर्च' संस्था गडचिरोली जिल्ह्यातील ग्रामीण लोकांना आणि आदिवासींना आरोग्य सेवा पुरविते, समुदायांना त्यांच्या आरोग्याची काळजी घेण्यास सक्षम करते. आणि स्थानिक, राष्ट्रीय आणि जागतिक आरोग्य धोरणांना आकार देण्यासाठी उच्च गुणवत्तेचे संशोधन करते. बालमृत्यूच्या गंभीर विषयावरून 'सर्च' च्या कार्याची सुरुवात झाली.

कोवळी पानगळ -

डॉ अभय बंग वर महात्मा गांधी, विनोबा भावे प्रमाणेच अमेरिकेत त्यांना सार्वजनिक आरोग्याचे घडे देणारे त्यांचे शिक्षक कार्ल टेलर यांचा प्रभाव होता. 'लोकांमध्ये जाताना तुमच्या डोक्यातले प्रश्न घेऊन जाऊ नका, लोकांमध्ये जा, त्यांचे प्रश्न समजवून घ्या आणि त्यांचे प्रश्न सोडवायचा प्रयत्न करा'. आरोग्य स्वराज्याशी जवळीक साधणार. कार्ल टेलर यांचे हे वाक्य डॉ. अभय बंग यांच्या अंतःकरणात वसलं आणि 'लोकांवर संशोधन नाही, तर लोकांसोबत संशोधन' हे अभय बंग यांच्या संशोधनाचे सूत्र बनले.

खेड्यातील आरोग्याच्या समस्यांचा शोध घेण्यासाठी त्यांनी शोधग्रामच्या आजूबाजूच्या चाळीस गावातील लोकांना एकत्रीत केले त्यांच्याशी चर्चा केली. सर्वात जास्त त्रास कशाचा आहे? हे विचारले, तेव्हा लहान मुल, अर्भक दगावतात असे आदिवासींनी सांगितले. बालमृत्यूचा प्रश्न लोकांना सर्वात जास्त भेडसावतो आहे, असे लक्षात आले. या समस्येला डॉ. अभय बंग यांनी नाव दिलं, 'कोवळी पानगळ'.

समस्येचा शोध घेतल्यानंतर संशोधन पद्धत ठरविण्यात आली. बालमृत्यूचे प्रमाण पाहण्याकरिता लोकांच्या सहभागाने सर्वेक्षण करण्यात आले. या आरोग्य सेवकांना 'बेअर फुट संशोधक' असे डॉ. अभय बंग म्हणतात. १९८८ मध्ये १०२ गावांचा सर्व्हे करण्यात आला. यात अर्भक मृत्यूदर १२१ असल्याचे आढळून आले या बाळांना कसे वाचविता येईल ? दवाखाने शकडो किमी दुर आहेत. जुन्या प्रथा व समज मुळे ओली बाळंतीन व बाळ यांना घरा बाहेर पडण्यास बंदी होती. भारताच्या राज्यघटनेतील कलम २१ ने भारतीय नागरिकांना जिवीत स्वतंत्र्याचा मानवी हक्क दिला आहे. जीवन जगण्यासाठी आवश्यक असलेल्या मुलभूत सुविधा प्राप्त होणे हा सर्वांचाच मानवाधिकार आहे. पण गडचिरोलीतील आदिवासी, ग्रामीण मुलभूत सुविधापासून वंचित आहे. दळणवळणाचे पूर्ण साधने नाहीत. आरोग्याच्या प्राथमिक सुविधासुद्धा नाहीत. मुल मरताहेत. प्रति जैविकांचा शोध ५० वर्षांपूर्वी लागुन ही, ती बाळापर्यंत पोहचत नव्हती. तेव्हा एकच उपाय होता वैद्यकीय सेवा घरी पोहचत्या करव्यात. हे करणार कोण ? त्यासाठी गावातील एक स्त्री व एक युवक याला प्रशिक्षण द्यावे असे ठरले. त्यांच्याकडून बाळाच्या आईला, आजीला बाळाची काळजी घेणे शिकवावे. त्यांना सक्षम करावे. गावाला सक्षम करणाऱ्या यांना काय म्हणावे ? निव्वळ आरोग्य सेवक व कर्मचारी न म्हणता 'आरोग्यदूत' हा नवीन शब्द डॉ. अभय बंग यांनी सुचविला. शास्त्रीय परीभाषेत याला 'होग बेस्ड न्यू बॉर्न केअर' असे डॉ. अभय बंग म्हणतात. अशा प्रकारे सर्च चा 'आजी, आई, दाई व भाई' हा संशोधन मॉडेल जन्मास आला.

डॉ. अभय बंग यांनी 'ब्रेथ कॉऊंटर' नावाच्या उपकरणाचा शोध लावला. या उपकरणाद्वारे १२ च्या पुढे मोजू न शकणाऱ्या स्त्रिया देखील न्युमोनियाचे निदान करून उपचार करू लागल्या. हा मॉडेल विकसित केल्यानंतर गडचिरोली जिल्ह्यामधल्या ३१ गावात प्रयोग सुरू झाला. पहिल्या ३ वर्षात (१९९५ - १९९८) नवजात अर्भकाचा मृत्यूदर ६२ टक्यांनी खाली आला. बालकाचे मृत्यू रोखल्या गेल्याने ते प्रमाण १२१ वरून ३० वर आले. सर्व देशाने समोर ठेवलेले लक्ष सर्चने प्रगत देशाच्या कितीतरी आधी गाठले. हे संशोधन जगात वैद्यकीय क्षेत्रात मानाच्या असलेल्या लॅन्सेट या जर्नल मध्ये प्रकाशित झाले. 'कोवळी पानगळ' हा शोध प्रबंध खुप गाजला. जगात बऱ्याच देशांनी हा प्रयोग सुरू केला. देशाच्या खेड्यापाड्यात हा प्रयोग करण्याचा निर्णय भारत सरकारने घेतला. बालमृत्यू रोखण्यासाठी हा प्रयोग सर्व विकसिनशील देशांनी राबवावा, असे निर्देश WHO आणि युनिसेफने जारी केले. भारतात केंद्रशासनाद्वारे पंचवार्षिक योजनेमध्ये या पद्धतीचा स्विकार करण्यात आला आणि याला व्यापक स्वरूप देत 'आशा' हा उपक्रम तयार केल्या गेला. सर्च संस्थेने २७ राज्यातल्या 'आशा' नां माता-बालसंगोपनाच प्रशिक्षण दिलं. वर्षे २०१७ मध्ये ८ लाख

'आशा' वर्कर्सद्वारा एक कोटी दहा लाख नवजात बालकांना घरोघरी वैद्यकीय सेवा देण्यात आली. बंग दाम्पत्यांच्या अथक परिक्षमातून 'आशा' हा उपक्रम सरकार राबवित आहे. 'आशा' च्या द्वारे वैद्यकीय सेवा गरजूंच्या घरापर्यंत पोहचत आहे. जीवित स्वातंत्र्याच्या मूलभूत हक्काची जोपसना केली जात आहे.

स्त्रियांच्या आरोग्याच्या प्रश्नांवरील संशोधन -

स्त्रीयांना स्त्रियांच्या आरोग्याच्या मूलभूत हक्क मिळवून देण्यासाठी बंग दाम्पत्य महत्वाचे योगदान देत आहे. डॉ. राणी बंग हया प्रथम महिला डॉक्टर आहे, की ज्या नश्लग्रस्त दुर्गम अशा गडचिरोलीत पोहचल्या आणि खूप धाडसाने वैद्यकीय सेवा देत आहे. डॉ. राणी बंग यांना उपचार करित असताना निदर्शनास आले की स्त्रियांना सामान्य आजारा बरोबरच स्त्रि रोगाच्या मोठ्या समस्या आहेत. यासाठी अमिर्झा आणि वसा या दोन गावात संशोधन करण्यात आले. संशोधनात स्पष्ट झाले की, स्त्रियांमध्ये गायनॅकॉलॉजिकल आजारांचे प्रमाण फार मोठ्या प्रमाणात आहे. यावरील एक पेपर १९८९ ला लॅन्सेट मध्ये छापून आले. यातील आकडेवारी वरून हे सिद्ध झाले की ९२ टक्के स्त्रियांना कुठल्याना कुठल्या प्रकारचा स्त्रियांचा आजार होतो. या रिसर्च पेपरमुळे 'मदर अॅन्ड चाईल्ड हेल्थ' अशी घोषणा झाली. आणि जागतिक आरोग्य संघटनेने महिला आरोग्य वर्षाची आखणी केली. विकसनशील देशांतील स्त्रियांच्या आरोग्यविषयीचं हे या दशकातील संशोधन आहे, असा त्याचा गौरव अमेरिकेतील तज्ज्ञांनी केला. गडचिरोलीत एक कावीळ झालेली मुलगी रूग्ण म्हणून आली तिचे रक्त तपासले असता वेगळ्या प्रकारच्या रक्तपेशी आढळल्या. ज्यांना सिकल सेल म्हणतात. गडचिरोलीत सिकल सेल संदर्भात सर्वे केला. सर्वेक्षणात मिळालेली माहिती पालकमंत्र्याशी बोलून जाहीर केली. त्यांनी आदिवासी रिसर्च सेंटर सुरू करण्याचे सांगितले. आणि पुण्यात विजे मेडिकल कॉलेजला त्यांनी ते सुरू केले.

मुक्तिपथ -

सार्वजनिक आरोग्याचे प्रश्न सोडवितांना दारू व तंबाखुच्या व्यसनामुळे खुप मोठे सामाजिक व आरोग्यविषयक प्रश्न निर्माण झाल्याचे दिसून आले. या समस्यांचे संशोधन केल्यानंतर या व्यसनाचे गंभीर परिणाम समोर आले. भारतीय संविधान कलम ४७ मध्ये नागरिकांच्या आरोग्याला हानिकारक असणारी मादक पेय व अंमली पदार्थ यांना औषधांच्या उपयोगाशिवाय सेवन करण्यास बंदी करण्याचा प्रयत्न राज्य करील असे सांगितले आहे. पण हे कलम मूलभूत हक्क व्हावे कारण व्यसनाधिनतेचे अत्यंत गंभीर परिणाम समोर येत आहे. हा दारू व तंबाखुच्या बिकट प्रश्न सोडविण्यासाठी डॉ. बंग दाम्पत्यांनी १९८८ पासून लोक चळवळ उभारली. ही चळवळ बंद करण्यासाठी अनेक प्रकारचे दबाव व धमक्या डॉ. बंग दाम्पत्यांना येत होत्या. पण तरीही न डगमगता ही समस्या सोडविण्याचा ध्यास डॉ. बंग दाम्पत्यांनी घेतला. त्यांच्या प्रयत्नांना यश मिळाले व १९९३ साली जिल्ह्यात दारू बंदी लागू झाली. दारूबंदीची प्रभावी अंमलबाजवणी करण्यासाठी, तंबाखु व दारूमुक्ती चे ध्येय गाठण्यासाठी, सर्वद्वारा 'मुक्तीपथ' हा उपक्रम आखण्यात आला. हा उपक्रम राज्यशासन, टाटा ट्रस्ट आणि गडचिरोलीचे लोक यांच्या सहकार्याने जिल्ह्यात आकारास आला. तरीही अजून दारूमुक्त महाराष्ट्र होणे बाकी आहे. महाराष्ट्रात दारूचा प्रचंड वापरामुळे महाराष्ट्राला 'मद्यराष्ट्र' हा शब्द चळवळीत वापरला गेला. अजूनही प्रयत्न सुरू आहे, 'महाराष्ट्राला, मद्यमुक्त करून महाराष्ट्र बनविण्याचे'. आधुनिक जिवनशैली मुळे फक्त आरोग्यविषयक समस्याच नव्हे, तर अनेक सामाजिक समस्या निर्माण होत आहेत. याला कारणीभूत व्यसनाधिनते सोबतच, धावपळीचे जीवन, जीवघेणी स्पर्धा, जंक फुड, फास्ट फुड चे माजलेले स्तोम वगेरे आहेत. आज गरज निर्माण झाली आहे आरोग्यविषयक जागरूकतेची कारण यातूनच सक्षम समाज निर्माण होईल. अणु विसर्जन - डॉ. अभय बंग यांना ४० व्या वर्षी हृदयरोग झाला. यावेळेस त्यांनी केलेल्या शोधाची विस्तृत माहिती 'माझा साक्षात्कारी हृदयरोग' पुस्तकात त्यांनी सांगितली आहे. सर्वांनाच स्वस्थ राहण्यासाठी मार्गदर्शक असलेल्या या पुस्तकाने खुप प्रसिद्धी मिळविली. डॉ अभय बंग च्या शब्दात, 'ऑन्जिओप्लास्टी चा टेबलावर मृत्यूच दर्शन झालं. ते भयावह होतं तसेच साक्षात्कारी ही होतं. त्या क्षणभरात मनात काय नाही घडलं ? हे शरीर आता मरणार, मग आपलं काय होईल ? शरीर विसर्जित होऊन त्याचे अनु रेणु विश्वामध्ये एकरूप होतील. मृत्यू म्हणजे एकेकाळी काही अणू एकत्र येऊन बनलेल्या माझ्या शरीराच विसर्जन, ऑन्जिओप्लास्टी चा टेबलावर त्या क्षणी देखील मनात नवा शब्द प्रगटला 'अणु विसर्जन' ! मृत्यू म्हणजे फक्त अणु विसर्जन, अरेच्चा ! छान, शब्द जगलो-वाचलो

तर लोकांना सांगु'. असा हा आगळा वेगळा संशोधक, सेवाव्रती, तपस्वी डॉ. अभय बंग. यांच्या मनात क्षणस्थ शब्द कसा उमटला.

क्षणस्थ -

ध्यानाच्या प्रयत्नात एका क्षणी डॉ. अभय बंग यांच्या लक्षात आले की, वर्तमानातही राहण कठीण आहे. कारण प्रत्येक क्षणी तो वर्तमानकाळ देखील भुतकाळ होतो. मग आयुष्य म्हणजे केवळ एक क्षण. प्रत्येक क्षणी केवळ क्षणात स्थित होणे, स्थिर होणे म्हणजे 'क्षणस्थ' ! मनापासून मुक्तीची अवस्था कशी राहिल ! 'क्षणस्थ' !

अशा प्रकारे डॉ. अभय बंग ची 'आरोग्य - स्वराज्य' ची संकल्पना असो, की त्यांच्या मनात प्रगट झालेले नवनवीन शब्द असो, हा फक्त त्यांच्यातील साहित्यिकांचा शब्द झंकार नाही तर मानवतेने ओतप्रोत भरलेल्या हृदयाचा हुंकार आहे. हा मानवतेचा हुंकार आहे. मानवाधिकाराचा हुंकार आहे. हा हुंकार 'सर्च' , 'शोधग्राम' मध्ये उमटत राहतो. डॉ अभय बंग शोधग्राम ला आरोग्याच्या शोधात असलेली वेड्या लोकांची वस्ती म्हणतात स्वतःला सतत आठवण राहावी तो केवळ पथिक आहे, पोचला नाहीस, म्हणून संस्थेचे नाव 'सर्च' व वस्तीचं नाव 'शोधग्राम' असे आहे.

सर्च चा लोगो आहे एका अंधारलेल्या जंगलातील पाऊलवाट. म्हणजे शोध. 'सर्च' या पाऊलवाटेवर चालत असताना गडचिरोली ही प्रयोग शाळा बनवून लावलेले शोध गडचिरोलीच्या जंगलातून राष्ट्रीय व आंतरराष्ट्रीय स्तरावर गेली. महत्वाची ठरली. संशोधनाच्या निष्कर्षावर राष्ट्रीय-आंतरराष्ट्रीय आरोग्य घोरणे ठरविली गेली. अंत्यत मागसलेल्या अतिदुर्गम, नक्षलग्रस्त भागात डॉ. अभय बंग व डॉ. राणी बंग हे जोडप अत्यंत भयानक परिस्थितीत अनेक संकटावर मात करत लोकांना, लोकांच्या सहभागाने, लोकात राहून आरोग्यसेवा गेल्या ३३ वर्षांपासून अखंडपणे देत आहे. सार्वजनिक आरोग्याच्या क्षेत्रातील त्यांच्या या अतुलनीय कार्याबद्दल राज्य, राष्ट्रीय व आंतरराष्ट्रीय अनेक पारितोषिक त्यांना प्राप्त झाली. आतापर्यंत ६० पेक्षा जास्त पारितोषिकांनी त्यांना सन्मानित करण्यात आले आहे. भारत सरकारच्या पद्मश्री पुरस्कार, महाराष्ट्र भूषण, अमेरिकेचा 'ग्लोबल हेल्थ हिरोज' जागतिक आरोग्य संघनेचा 'पब्लिक हेल्थ चॅम्पियन्स' अशा अनेक महत्वाचा पारितोषिकांनी त्यांना गौरवान्वित करण्यात आले आहे. तसेच मानद डी-एससी व डी.लीट या पदव्यांनीही सन्मानित करण्यात आले आहेत. नुकतेच ३ मार्च २०२० ला वैद्यकीय अभिमत विद्यापीठ, अहमदनगर डी.एससी (डॉक्टर ऑफ सायन्स) हा सन्मान देऊन गौरविण्यात आले आहे. २८ फेब्रुवारीला २०२० नवी दिल्ली येथे पॉपुलेशन फौंडेशन ऑफ इंडियाच्या ५० व्या वर्धापनाच्या दिवशी प्रसिद्ध उद्योगपती आणि टाटा ग्रुप चे अध्यक्ष रतन टाटा यांच्या हस्ते डॉ. अभय बंग व डॉ. राणी बंग या दाम्पत्यांना लोकसेवेसाठी प्रथमच दिला जाणारा जे.आर.डी. टाटा सन्मानाने पुरस्कृत करण्यात आले.

निष्कर्ष

गडचिरोलीच्या खेड्यापाड्यात राहणाऱ्या गरीब अशिक्षित आदिवासींना बरोबर घेऊन त्यांच्यासाठी केलेल्या अभ्यासाचे निष्कर्ष नवी दिल्ली पासून न्यूयॉर्कपर्यंत आणि लंडनपासून जिनिव्हापर्यंतच्या विचारांना संपुर्णतः नवी दिशा देण्या इतके महत्वाचे सामर्थ्यशाली असू शकतात हे डॉ. अभय बंग आणि डॉ. राणी बंग यांनी 'सर्च' या संस्थेच्या माध्यमातून जगाला दाखवून दिले. सार्वजनिक आरोग्याच्या क्षेत्रात डॉ. अभय बंग यांच्या अभिनव संकल्पना व नवनवीन शब्द 'सर्च' चा संशोधनाचा मानवी चेहरा आहे. समाज परिवर्तनासाठी सेवे सोबत वैज्ञानिक शोधांचे, मानवतावादी दृष्टीकोनाचे महत्त्व त्यांनी सिद्ध केले. लोकांसोबत राहून, लोकांना सोबत घेऊन, खेड्यातील आरोग्यविषयक समस्यांचा शोध घेतल्या जाऊ शकतो. त्यांच्या निराकरणाकरिता संशोधन करून, उपाययोजना यशस्वीपणे राबवून खेड्यातील आरोग्य सुधारले जाऊ शकते आणि आरोग्य स्वराज्य स्थापन केल्या जाऊ शकते यांचा यशस्वी कृतीपट बंग दाम्पत्यांनी आम्हाला दाखविला आहे. आरोग्य स्वराज्य संकल्पनेत लोकांना स्वतंत्र करणारा नैतिक व राजकीय अर्थ प्रगट झाला आहे. आधुनिक जीवनशैलीमुळे आरोग्याच्या नवनवीन समस्या निर्माण होत आहेत. 'आरोग्य स्वराज्य' ने आरोग्यदायी समाज साध्य करता येतो.

डॉ. अभय बंग म्हणतात, 'महाराष्ट्रात आरोग्य स्वराज्य' स्थापन करण्याची वेळ आली आहे. आजारी लोकसंख्या असलेले राज्य कधीही वाढू, समृद्ध आणि प्रगती करू शकत नाही. जर प्रतिबंध, आरोग्य जागरूकता, प्राथमिक आरोग्य सेवा आणि आरोग्य स्वराज्य हे आपल्या राज्याचे आरोग्य सेवेचे चार आधार स्तंभ बनले तर आपण

स्वस्थ महाराष्ट्र होण्यापासून दूर नाही'. बंग दाम्पत्यांनी शोधग्राम व सर्च मधून राबविलेली आरोग्य स्वराज्य संकल्पना आरोग्यदायी समाजचं आदर्श मॉडेल बनेल यात दुमत नाही. मानवतावादी कार्यासाठी दिला जाणारा महात्मा गांधी पुरस्काराने सन्मानित डॉ. अभय बंग व डॉ. राणी बंग यांनी आरोग्य विषयक मानवाधिकारा संबंधी केलेले कार्य पथदर्शक आहे. सर्च चे या पथावर चालणे सुरूचं आहे. गरज आहे या स्वस्थ पथावर आम्हा सर्वांना चालण्याची.

संदर्भसुची

1. <https://mr.m.wikipedia.org>
 2. <https://www.akshernama.com>
 3. <https://lekhsangran.wordpress.com>
 4. <https://infomarthar.in/doctor-abhay>
 5. <https://www.loksatta.com/shreyas>
 6. <https://searchforhealth.org>
 7. <https://m.timesofindia.com>
 8. <https://www.medicalmantra.com>
 9. <https://reachinus.org>
 10. <https://www.limkden.com>
 11. <https://youtube/zyijev7qmko>
 12. <https://youtube/bscllmokt3c>
- १३ डॉ. अभय बंग – माझा साक्षात्कारी हृदयरोग, राजहंस प्रकाशन, पुणे



iJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 Issue: VII Month of publication: July 2021

DOI: <https://doi.org/10.22214/ijraset.2021.36601>

www.ijraset.com

Call:  08813907089

E-mail ID: ijraset@gmail.com

Formulation of India State Hunger Index and Assessment of Associated Factors

Arshi T. Khan¹, P.V. Ubale²

^{1,2}Department of Statistics, G. S. science, Arts and Commerce College, Khamgaon, Maharashtra

Abstract: *There are many faces of hunger such as loss of energy, lack of interest, increased vulnerability to disease, shortfalls in nutritional status and premature death. Hunger is usually linked with lack of food. India State Hunger Index was formulated by assigning weights to the components of the index using principal component analysis. Association between hunger index and factors affecting it was assessed. Kerala has the minimum index score indicating less hunger, whereas, Jharkhand has the maximum index score depicting serious hunger situation. Literacy (men-women), households with improved drinking water facility and households with sanitation facility are highly associated with the India State Hunger Index. The factors like literacy (men-women), household with improved drinking water and sanitation facility and child's adequate diet are required to be considered while framing the policies to mitigate the problem of hunger.*

Keywords: *India State Hunger Index, literacy, water, sanitation.*

I. INTRODUCTION

There are many faces of hunger such as loss of energy, lack of interest, increased vulnerability to disease, shortfalls in nutritional status and premature death. Hunger is usually linked with lack of food. The food and agriculture organization of United Nations (FAO) defines food deprivation and under nutrition, as the consumption of less than 1800 kcal – the minimum requirement that people need to live a fit and fruitful life.

One of the forms of hunger called hidden hunger that goes beyond calories which defines as the lack of energy, proteins or essential vitamins and minerals. It is also called undernourishment and is a result of insufficient intake of food (either quality or quantity), poor utilization of nutrients etc. These are caused by a variety of factors including insecure domestic atmosphere, inadequate maternal health or childcare practices or inadequate access to health services, clean water and sanitation. For the sake of assessment of hunger, it is necessary to point out the range of causes and factors which directly or indirectly affect hunger. Out of several factors affecting hunger worldwide, factors like, literacy (men-women), households with improved drinking water facility, households with improved sanitation facility, and child adequate diet, poverty and GDP are taken into consideration for present study.

India is dealing with one of the extreme situations of hunger and malnutrition which needs an urgent attention and effective action plans. Besides having a large population, India is having a great manpower and it can lead the nation towards advancements and growth. Since a healthy body can concentrate easily and can take initiatives for physical and mental activities, ultimately gives enormous results, it implies that healthy population has direct relationship with growth of its nation. So it is very necessary to showcase the hunger situation at sub national level. Present study explains the calculation of hunger index at state level viz; India State Hunger Index (ISHI) and factor affecting hunger. Such type of micro level index can serve as a powerful tool to measure the extent of hunger, formulate effective action plans and providing solutions to fight hunger.

II. METHODS

A. India State Hunger Index (ISHI)

It is a tool to calculate hunger and malnutrition at the sub-national level in India. It is engineered in the same way as the Global Hunger Index (GHI). The ISHI was developed by the International Food Policy Research Institute (IFPRI) and launched for the first time in 2008, in conjunction with the Non-Governmental Organization Welthungerhilfe and the Department of Economics, University of California. With regards to the planning and execution of the developmental programmes, state governments play a pivotal role in Indian political system. Thus calculating Hunger Index at state level will definitely become a tool to build awareness of the disparities among state hunger indices [1].

(Source: https://en.wikipedia.org/wiki/India_State_Hunger_Index)

B. Components of India State Hunger Index (ISHI)

The India state hunger index is comprised of four components; 1) Percentage of population undernourished (PUN), 2) Percentage of Stunted children under 5years of age (CST), 3) Percentage of Wasted children under 5years of age (CWA) and 4) Mortality rate of children under 5years of age (CM).

C. Data

The data pertaining to the components of India State Hunger Index viz; stunting, wasting and child mortality under five years of age of children was taken from reports of 4th round of National Family Health Survey (NFHS) 2015-16. Whereas, the data for prevalence of undernourishment was calculated using method suggested by Food and Agriculture Organization (FAO) based on the available data of 2011-12 (Table 1) [2].

Table 1. State Wise Values OF Components of ISHI

Sr. No.	States / UTs	Percentage of Undernourished population (PUN)	Percentage of Stunted children under 5 years of age (CST)	Percentage of Wasted children under 5 years of age (CWA)	Percentage of Child Mortality under 5 years of age (CM)
1	A & N Islands	17.90	23.3	18.9	1.30
2	Andhra Pradesh	28.13	31.4	17.2	4.08
3	Arunachal pradesh	17.90	29.4	17.3	3.28
4	Assam	40.78	36.4	17.0	5.66
5	Bihar	31.09	48.3	20.8	5.81
6	Chhattisgarh	38.21	37.6	23.1	6.42
7	Daman & Diu	17.90	23.4	24.1	3.40
8	D & N Haveli	17.90	41.7	27.6	4.20
9	Delhi NCT	17.90	32.3	17.1	4.20
10	Goa	17.90	20.1	21.9	1.29
11	Gujarat	44.22	38.5	26.4	4.35
12	Haryana	28.09	34.0	21.2	4.11
13	Himachal Pradesh	16.31	26.3	13.7	3.76
14	Jammu & Kashmir	22.84	27.4	12.1	3.76
15	Jharkhand	39.19	45.3	29.0	5.45
16	Karnataka	43.69	36.2	26.1	3.22
17	Kerala	17.90	19.7	15.7	0.71
18	Lakshadweep	17.90	27.0	13.8	3.00
19	Madhya Pradesh	38.15	42.0	25.8	6.49
20	Maharashtra	36.97	34.4	25.6	2.91
21	Manipur	17.90	28.9	6.8	2.59
22	Meghalaya	17.90	43.8	15.3	3.97
23	Mizoram	17.90	28.0	6.1	4.59
24	Nagaland	17.90	28.6	11.2	3.73
25	Odisha	34.96	34.1	20.4	4.86
26	Punjab	28.41	25.7	15.6	3.32
27	Puducherry	17.90	23.7	23.6	3.22
28	Rajasthan	29.53	39.1	23.0	5.07
29	Sikkim	17.90	29.6	14.2	3.22
30	Tamil Nadu	48.74	27.1	19.7	2.69
31	Telangana	17.90	28.1	18	3.36
32	Tripura	17.90	24.3	16.8	3.26
33	Uttarakhand	18.34	33.5	19.5	7.81
34	Uttar Pradesh	34.45	46.3	17.9	4.67
35	West Bengal	38.38	32.5	20.3	3.18
36	India	36.38	38.4	21.0	5.00

(Source: NFHS, 2015-16)

The data for the factors affecting hunger (Table 2) viz; literacy men, literacy women, percentage of population having access to safe drinking water, percentage of population having sanitation facility, percentage of children of age 6 to 23 months receiving an adequate diet were taken from National Family Health Survey [3].

Table 2:
Data Related to Factors Affecting Hunger Index.

Sr. No.	State	Literacy		Drinking water	Sanitation	Child adequate diet	GDP	poverty
		Men	Women					
1	A & N Islands-UT	88.5	84.1	94.3	74.3	14.2	--	--
2	Andhra Pradesh	79.4	62.9	72.7	53.6	7.6	604229	4.69
3	Arunachal Pra.	84.5	65.6	72.7	61.3	14	18509	36.94
4	Assam	82.8	71.8	83.8	47.7	8.9	227959	30.70
5	Bihar	77.8	49.6	98.2	25.2	7.5	371602	25.63
6	Chhattisgarh	85.7	66.3	91.1	32.7	10.9	225163	35.32
7	Daman & Diu-UT	89.7	83.1	89.4	60.4	6.5	--	--
8	D & N Haveli-UT	82.6	62.5	77.5	35.4	0	--	--
9	Delhi NCT-UT	89.3	80.9	80	73.3	5.2	--	8.44
10	Goa	94.7	89	96.3	78.3	10.4	55054	2.06
11	Gujarat	89.6	72.9	90.9	64.3	5.2	1029010	11.45
12	Haryana	90.6	75.4	91.7	79.2	7.5	495504	7.23
13	Himachal Pra.	96.2	88.2	94.9	70.7	10.9	114239	4.47
14	Jammu & Kashm.	87	69	89.2	52.5	23.5	117168	9.08
15	Jharkhand	79.7	59	77.8	24.4	7.2	206613	32.96
16	Karnataka	85.1	71.7	89.3	57.8	8.2	1045168	15.99
17	Kerala	98.7	97.9	94.3	98.1	28.4	561994	3.96
18	Lakshadweep-UT	98.8	95.6	91.5	99.2	15.9	--	--
19	Madhya Pradesh	81.8	59.4	84.7	33.7	6.6	541068	24.83
20	Maharashtra	92.8	80.3	91.5	51.9	6.5	1966225	11.12
21	Manipur	96	85	41.6	49.9	18.8	19531	36.29
22	Meghalaya	84	82.8	67.9	60.3	23.5	25117	10.01
23	Mizoram	98.1	93.4	91.4	83.3	14.5	15139	24.04
24	Nagaland	85.6	80.9	80.6	75.1	18.8	19524	28.88
25	Odisha	84.3	67.4	88.8	29.4	8.5	328550	23.64
26	Punjab	87.5	81.4	99.1	81.5	5.9	390087	4.90
27	Puducherry-UT	92	85.1	95.8	66.5	30.8	26617	7.83
28	Rajasthan	85.4	56.5	85.6	45	3.4	681482	9.04
29	Sikkim	91.5	56.6	97.6	88.2	23.1	18034	3.83
30	Tamil Nadu	89.1	79.4	90.6	52.2	30.7	1176500	6.61
31	Telangana	83.4	65.5	77.9	50.5	10.1	577902	--
32	Tripura	89.5	80.4	87.3	61.3	5.9	35938	7.70
33	Uttarakhand	90.7	76.5	92.9	64.5	8.5	177163	6.16
34	Uttar Pradesh	82.4	61	96.4	35	5.3	1137808	24.35
35	West Bengal	81.1	70.9	94.6	50.9	19.6	797300	14.69
36	India	85.7	68.4	89.9	48.4	9.6	--	16.18

(Source: NFHS, 2015-16)

The data for poverty was not available for the year 2015-16. Therefore, it was calculated on the basis of previous year data available for 30 states (2004-05 and 2011-12) by using annual percentage change (Table 2).

The method of Principal Components provides a convenient way of assigning proper weights to the components to form India state hunger Index. It provides optimal weights that capture the largest fractions of the variance of the original variable based on the data available [4]. Principal component analysis was performed using the SPSS software trail version 20

India state hunger Index was framed by assigning the weights derived from PCA to the components of the index.

$$ISHI = (PCA \text{ weight}) * PUN + (PCA \text{ weight}) * CWA + (PCA \text{ weight}) * CST + (PCA \text{ weight}) * CM$$

The index reflects scoring by states on a 100-point scale where 0 is the best score (no hunger) and 100 the worst. A score greater than or equals 50 is defined as ‘extremely alarming’; 35 to 50 as ‘alarming’; 20 to 35 as ‘serious’; 10 to 20 as ‘moderate’ and less than or equals 10 as ‘low’.

The association between factors and index was analysed by calculating the Karl Pearson’s correlation coefficient.

III.RESULTS

The weights for the components of the ISHI were calculated using principal component analysis. The percentage of children who are stunted in India have higher weight of 0.29 and that of wasted is 0.22. The weights for child mortality under 5 years of age and the percentage of population undernourished 0.24 and 0.25, respectively.

On the basis of weights the composite index was formed using the following formula

$$ISHI = 0.25 * PUN + 0.22 * CWA + 0.29 * CST + 0.24 * CM$$

Table 3
Calculation of ISHI and Ranking of States

Rank	States / UTs	0.25 * PUN	0.22 * CWA	0.29 * CST	0.24 * CM	ISHI
1	Kerala	4.48	3.45	5.71	0.17	13.81
2	Manipur	4.48	1.50	8.38	0.62	14.97
3	Mizoram	4.48	1.34	8.12	1.10	15.04
4	Goa	4.48	4.82	5.83	0.31	15.43
5	Himachal Pradesh	4.08	3.01	7.63	0.90	15.62
6	A & N Islands	4.48	4.16	6.76	0.31	15.70
7	Tripura	4.48	3.70	7.05	0.78	16.00
8	Lakshadweep	4.48	3.04	7.83	0.72	16.06
9	Nagaland	4.48	2.46	8.29	0.90	16.13
10	Sikkim	4.48	3.12	8.58	0.77	16.96
11	Jammu & Kashmir	5.71	2.66	7.95	0.90	17.22
12	Puducherry	4.48	5.19	6.87	0.77	17.31
13	Daman & Diu	4.48	5.30	6.79	0.82	17.38
14	Telangana	4.48	3.96	8.15	0.81	17.39
15	Arunachal Pradesh	4.48	3.81	8.53	0.79	17.59
16	Delhi NCT	4.48	3.76	9.37	1.01	18.61
17	Punjab	7.10	3.43	7.45	0.80	18.78
18	Uttarakhand	4.59	4.29	9.72	1.87	20.47
19	Andhra Pradesh	7.03	3.78	9.11	0.98	20.90
20	Meghalaya	4.48	3.37	12.70	0.95	21.50
21	Haryana	7.02	4.66	9.86	0.99	22.53
22	D & N Haveli	4.48	6.07	12.09	1.01	23.65
23	West Bengal	9.59	4.47	9.43	0.76	24.25
24	Odisha	8.74	4.49	9.89	1.17	24.28
25	Rajasthan	7.38	5.06	11.34	1.22	25.00
26	Tamil Nadu	12.19	4.33	7.86	0.65	25.02
27	Maharashtra	9.24	5.63	9.98	0.70	25.55
28	Assam	10.19	3.74	10.56	1.36	25.85
29	Chhattisgarh	9.55	5.08	10.90	1.54	27.08
30	Uttar Pradesh	8.61	3.94	13.43	1.12	27.10
31	Bihar	7.77	4.58	14.01	1.39	27.75
32	Karnataka	10.92	5.74	10.50	0.77	27.94
33	Madhya Pradesh	9.54	5.68	12.18	1.56	28.95
34	Gujarat	11.05	5.81	11.17	1.04	29.07
35	Jharkhand	9.80	6.38	13.14	1.31	30.62
	India	9.10	4.62	11.14	1.20	26.05

The index coins the value of 13.81 for Kerala, which is least, followed by 16 other states in Moderate category (Table 3). Apart from this remaining 18 states falls in serious category. The largest value of index is 30.62 for Jharkhand. Gujarat, Madhya Pradesh, Karnataka and Bihar are the predecessor of Jharkhand with index values 29.07, 28.95, 27.94 and 27.75, respectively (Fig. 1)(Table 4). The value of index for India is 26.05, which indicate that India comes in serious category.

According to the index score and ranking of states, no state falls in low, alarming and extremely alarming category.

Figure 1: Severity of Hunger in India

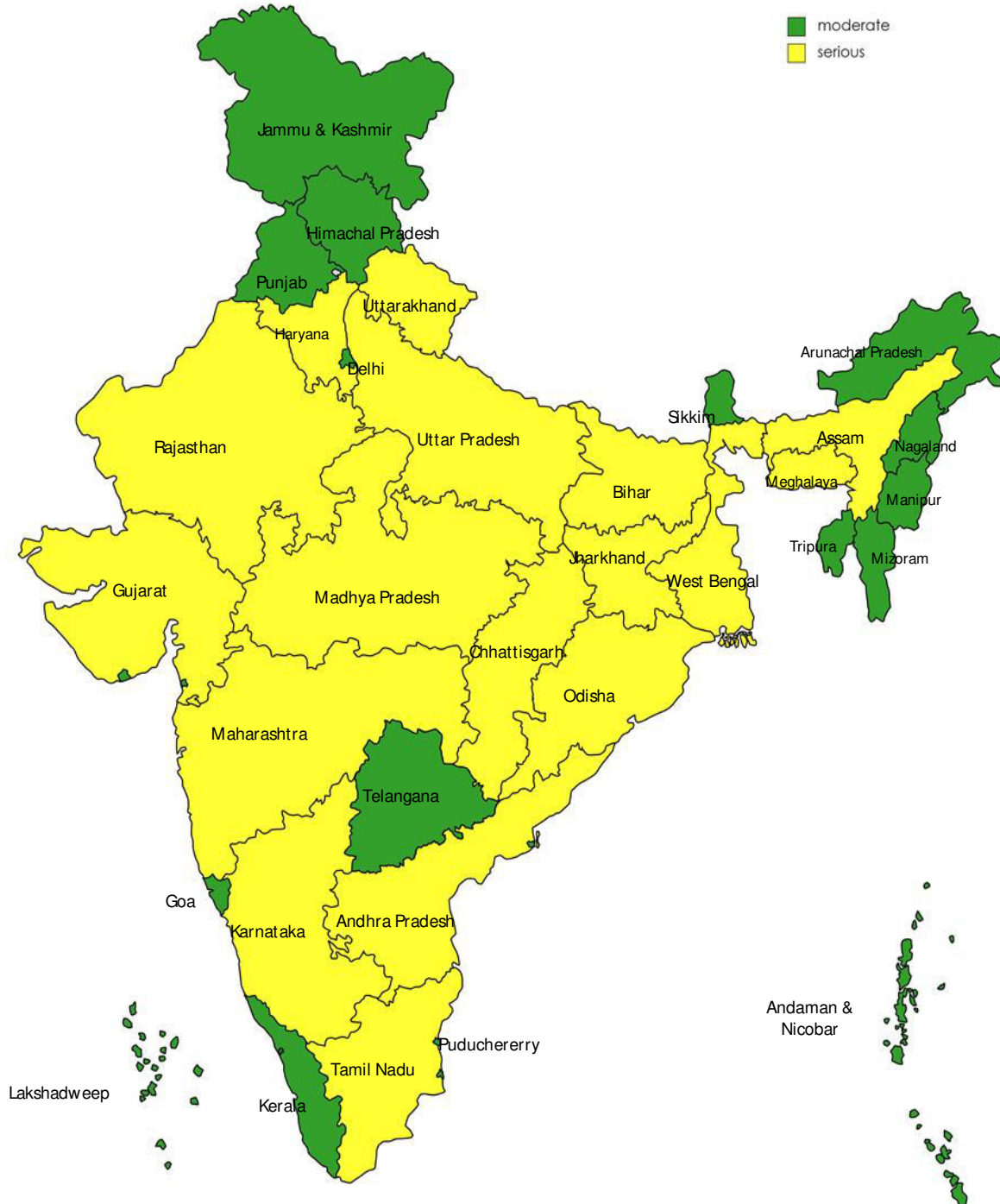


Table 4
Categorization of States/UTS.

SN	<10 Low	>=10 to 20 Moderate	>=20 to 35 Serious	>=35 to 50 Alarming	>=50 Extremely alarming
1	None	Kerala	Uttarakhand	None	None
2		Manipur	Andhra Pradesh		
3		Mizoram	Meghalaya		
4		Goa	Haryana		
5		Himachal Pradesh	D & N Haveli		
6		A & N Islands	West Bengal		
7		Tripura	Odisha		
8		Lakshadweep	Rajasthan		
9		Nagaland	Tamil Nadu		
10		Sikkim	Maharashtra		
11		Jammu & Kashmir	Assam		
12		Puducherry	Chhattisgarh		
13		Daman & Diu	Uttar Pradesh		
14		Telangana	Bihar		
15		Arunachal Pradesh	Karnataka		
16		Delhi NCT	Madhya Pradesh		
17		Punjab	Gujarat		
18			Jharkhand		

TABLE 5
CORRELATIONS BETWEEN INDEX AND FACTORS.

	ISHI	literacy- men	literacy- women	drinking water	sanitation	child adequate diet	GDP	poverty
ISHI	1	-0.648**	-0.656**	0.591	-0.726**	-0.412*	0.264	0.253
literacy- men	-0.648**	1	0.815**	0.128	0.750**	0.345*	-0.085	-0.220
literacy- women	-0.656**	0.815**	1	0.041	0.726**	0.387*	-0.111	-0.284
drinking water	0.591	0.128	0.041	1	0.237	-0.009	0.081	-0.228
Sanitation	-0.726**	0.750**	0.726**	0.237	1	0.371*	-0.137	-0.212
child adequate diet	-0.412*	0.345*	0.387*	-0.009	0.371*	1	-0.121	-0.124
GDP	0.264	-0.085	-0.111	0.081	-0.137	-0.121	1	0.038
poverty	0.253	-0.220	-0.284	-0.228	-0.212	-0.124	0.038	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

A. Correlations Between Index and Factors

Karl Pearson's correlation coefficient was calculated between index and factors and displayed in table 5.

- 1) Literacy: Literacy (men & women) is significantly associated with India State Hunger Index. It indicates that small increments in the literacy rate can have positive effect on index.
- 2) Household with improved drinking water: Drinking water is positively correlated with all four version of the index. It showed that improving drinking facility may cut down the consequences of hunger.
- 3) Household with sanitation facility: The percentage of household with sanitation facility is highly correlated with index and other factors viz; literacy (men & women) and child's adequate diet. It does not have any significant association with access to safe drinking water, GDP, and poverty.
- 4) Child's adequate diet: Child's adequate diet is significantly correlated with the index, literacy and sanitation facility. Also it shows negative correlation with GDP and poverty.

GDP and poverty does not show any significant correlation with the index and factors.

B. Discussion

The book "Towards Hunger Free India" [5] examines the possibilities for achieving freedom from hunger in India by 2007. Emphasis is also placed on prioritized community-based investments such as the provision of clean drinking water, nutritious food, health care and education.

The main reason why child malnutrition is still rampant in South Asia and at a higher rate than the drought-stricken, sub-Saharan Africa disputes that women's nutrition, eating habits and childcare practices are inadequate, related to shortages in terms of women's education and social status [6].

The role of female literacy in reducing the risk of child malnourishment was studied and concluded that when a mother learns, the real benefits flow to children in terms of reduced risk; the same benefits, however, do not go away when the father, but not the mother, learns. Educated mothers make more effective use of health-care institutions and hospitals [7].

Child and infant mortality; child malnutrition; schooling enrolment and completion; gender disparities in schooling; and hunger-poverty: the 5 millennium development goals were focused and emphasized that the data and analysis will be essential for policy-makers, scholars and researchers in the fields of development studies, health, economics and politics, and also for activists in organizations [8].

Intensive nutrition education for mothers improves child nutritional status significantly and sustainably even when no nutritional supplements are provided, and this effect is accountable to proper maternal child feeding and caring practices [9].

India's rising GDP has had very less influence on food security and the nutrition situations of the country. Per capita availability and consumption of food grains has also reduced; the cereal consumption of the bottommost 30% of the population remains to be much less than that of the top two deciles of the population. The percentage of under-nourished stunted children was as high as 39% in 2014; and more than half of India's women and three-quarters of its children are anaemic, with little decline in these estimates in the past eight years, resulted in maternal mortality and underweight babies [10].

Global Hunger Index (GHI) with the predictors encompassing a variety of factors including basic, political, economic, and infrastructural needs was discussed and concluded that the GHI in India and Nigeria was significantly affected by gross domestic product per capita (GDPC) and water access, while only water was significant in determining Brazil's GHI [11].

Poor sanitation remains a chief public health concern linked to several important health issues; it is quite evident that poor sanitation is linked with childhood stunting. The author also found that more than half of the population defecates openly in India; therefore, prevalence of stunting remains higher [12].

IV. CONCLUSIONS

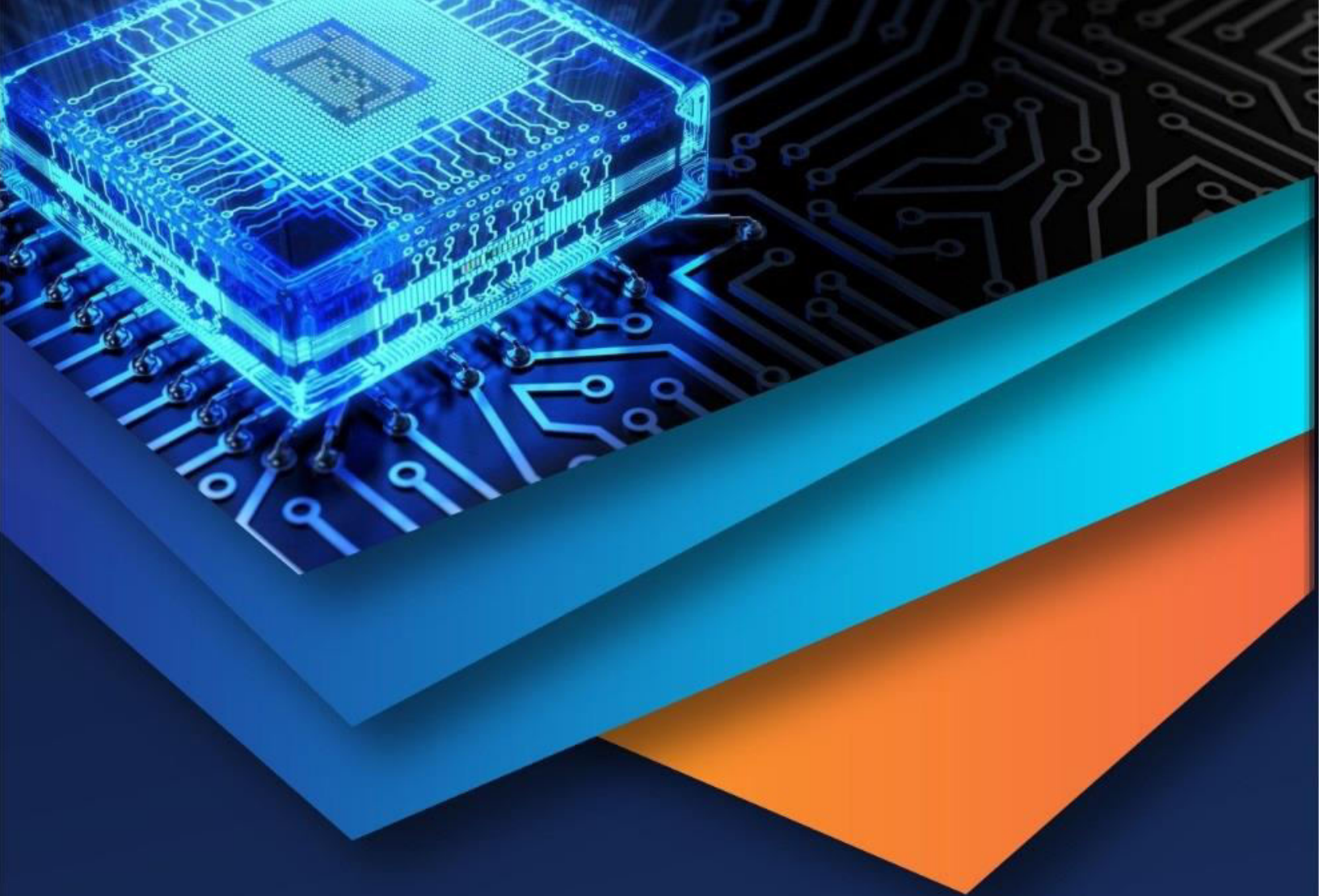
No state falls in low, alarming and extremely alarming category. Kerala has the minimum index score indicating less hunger, whereas, Jharkhand has the maximum index score depicting serious hunger situation. 17 states of India fall in moderate category and 18 states in serious category. India is categorized in serious category.

Literacy (men-women), households with improved drinking water facility and households with sanitation facility are highly associated with the India State Hunger Index.

The states which are categorized in serious category of hunger index the factors like literacy (men-women), household with improved drinking water and sanitation facility and child's adequate diet are required to be considered while framing the policies to mitigate the problem of hunger.

REFERENCES

- [1] Menon, P., Deolalikar, A., & Bhaskar, A. Comparisons of hunger across states: India state hunger index. <https://books.google.com/books?hl=en&lr=&id=SXQZCjkfYlK&oi=fnd&pg=PA5&dq=hunger+index+of+india&ots=9jLULfr-JN&sig=UP0h1GISPt6PW9FmUPYZmVCfOds>, 2008.
- [2] Rawal, V., Bansal, V., & Bansal, P. Prevalence of undernourishment in Indian States Explorations based on NSS 68th round data. *Economic and Political Weekly*, 54(15), 35–45, 2019.
- [3] NFHS4(2015-16). (n.d.). NFHS 4. India. International Institute for Population Sciences (IIPS) and ICF. 1–192. 2017 <http://rchiips.org/nfhs/NFHS-4Reports/India.pdf>.
- [4] Wiesmann, D., Weingärtner, L., & Schöninger, I. The challenge of hunger: Global Hunger Index: Facts, determinants, and trends. <https://books.google.com/books?hl=en&lr=&id=40bN91xgGi8C&oi=fnd&pg=PA6&dq=hunger+index+of+india&ots=Tu8NqEdnlE&sig=miksVZBQ14yVfu15HTCP5ur0rrc>, 2006.
- [5] Asthana, M., And, P. M.-T. hunger free I. agenda, & 2001, U. Towards hunger free India: agenda and imperatives. *Cabdirect.Org*. <https://www.cabdirect.org/cabdirect/abstract/20033011061>, 2001.
- [6] Smith, L. C., Ramakrishnan, U., Ndiaye, A., Haddad, L., & Martorell, R. The importance of Women's status for child nutrition in developing countries: international food policy research institute (IFPRI) research report abstract 131. *Food and Nutrition Bulletin*, 24(3), 287–288, 2003.
- [7] Borooah, V. K. The role of maternal literacy in reducing the risk of child malnutrition in India. *Journal of Quantitative Economics*, 2(2), 186–202, 2004.
- [8] Deolalikar, A. B. Attaining the millennium development goals in India: reducing infant mortality, child malnutrition, gender disparities and hunger-poverty and increasing school enrollment and completion. Oxford University Press, 2005.
- [9] Roy, S. K., Fuchs, G. J., Mahmud, Z., Ara, G., Islam, S., Shafique, S., Akter, S. S., & Chakraborty, B. Intensive Nutrition Education with or without Supplementary Feeding Improves the Nutritional Status of Moderately-malnourished Children in Bangladesh. *Journal of Health, Population and Nutrition*, 23(4), 320–330. <http://www.jstor.org/stable/23499248>, 2005
- [10] Saxena, N. C. Hunger and Malnutrition in India. *IDS Bulletin*, 43(SUPPL. 1), 8–14. <https://doi.org/10.1111/j.1759-5436.2012.00341.x>, 2012.
- [11] Samant, T. S. Impact of Hunger on Food Security in Developing Countries: A Multivariable Analysis of the Global Hunger Index. *SS-AAEA Journal of Agricultural Economics*, 2013(318-2016–9557), 1–16, 2013.
- [12] Spears, D., Ghosh, A., & Cumming, O. Open defecation and childhood stunting in India: an ecological analysis of new data from 112 districts. *PloS One*, 8(9), e73784, 2013



10.22214/IJRASET



45.98



IMPACT FACTOR:
7.129



IMPACT FACTOR:
7.429



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089  (24*7 Support on Whatsapp)



Identification of Statistical Weights for the Components of the Hunger Index

Arshi Khan* and P.V. Ubale

Department of Statistics, G.S. College of Arts, Commerce and Science, Khamgaon

*Corresponding author : arshi29khan@gmail.com

Abstract

There are many faces of hunger such as loss of energy, lack of interest, increased vulnerability to disease, shortfalls in nutritional status and premature death. Global Hunger Index is a tool that measures hunger globally, by region, and by country. Principal component analysis provides a convenient way of assigning proper weights to the components to form a composite hunger index. The results indicated the highest weight (0.29) for the percentage of stunted children in India followed by percentage of population undernourished (0.25), child mortality (0.24) and percentage of wasted children (0.22). This also suggests the percent contribution of these components is 29%, 25%, 24% and 22%, respectively. Along with the healthy diet improved, processed, complementary foods as well as dairy products and supplements of iron and calcium should be incorporated in the mother's diet.

Key words : *Hunger index, undernourishment, stunting, wasting, child mortality, principal component analysis.*

Introduction

World is facing, one of the many terrible problems which is threatening the existence of human being, a cruel hunger. There are many faces of hunger such as loss of energy, lack of interest, increased vulnerability to disease, shortfalls in nutritional status and premature death.

The development agenda has a factor of brawling with under nutrition and hunger. Poverty reduction being in which, food security and nutrition are been stalked, plays a vital role. Connecting this hunger and malnutrition are not withstand the process required for the targets and even if the portion of hungry people bisects by 2015 under the millennium development goal, the adequacy of people suffering from hunger will be nearly 580 million according to the recent predictions .

Adults who were malnourished as children are less physically and intellectually productive, have lower educational attainment and lifetime earnings and are affected by higher levels of chronic illness and disability . The collaborative efforts of the Government of India and the World Bank in nutrition in 1980 reviewed the effectiveness, efficiency and impact of public spending on nutrition in India, as well as suggesting means for improvement. The report analysed the three main causes for malnutrition i.e. inadequate food intakes, disease and pernicious caring practices. Steps and improvements concerning malnutrition have been taken seriously by the Government, through target food supplementation, micro-nutrient programmes, and food subsidy programmes. The report submitted that these policies and programmes have limited impact on nutrition among the poor, due to ineffective targeting, implementation, and

coverage and a higher level of sustained political commitment is required for India to succeed on the subject of malnutrition. This will definitely require structural actions at the national, state, and local levels in sectors such as agriculture, industry, water, and sanitation . Studied the nutritional situation in India and found that it depends on the measures of undernutrition consulted. FAO estimates based on the national availability of food and its distribution across households suggests that about one quarter of Indian household have a habitual insufficient calorie intake.

Global Hunger Index : It is a tool that measures hunger globally, by region, and by country. The GHI is calculated annually, and its results published in a report issued in October each year.

The GHI was shaped in 2006 initially published by the International Food Policy Research Institute (IFPRI). Welthungerhilfe in 2007, the Irish NGO Concern Worldwide also became a co-publisher. In 2018, the GHI was a joint project of Welthungerhilfe and Concern Worldwide, with IFPRI stepping aside from its involvement in the report.

The 2018 Global Hunger Index (GHI) report, the 13th in the annual progression, presents a multidimensional measure of national, regional, and global hunger by assigning a numerical score based on several aspects of hunger. It then ranks countries by GHI score and compares current scores with past results. It also showed that in many countries and in terms of the global average, hunger and under nutrition have declined since 2000; in some parts of the world, however, hunger and under nutrition persist or have even worsened. Since 2010, 16

countries have seen no change or an increase in their GHI levels (Table-1).

GHI is comprised of four components (5)

(1) Percentage of population undernourished (PUN).

(2) Percentage of Stunted children under 5years of age.

(3) Percentage of Wasted children under 5years of age.

(4) Mortality rate of children under 5years of age.

Percentage of population undernourished (PUN) :

According to Food and Agriculture Organization (FAO), percentage of population undernourished is defined as “the probability that a randomly selected individual from the reference population is found to consume less than his/her calorie requirement for an active and healthy life”. It is written as :

$$PoU = \int_{x-MDER} f(x) dx$$

Where; $f(x)$ = probability density function of per capita calorie consumption.

$MDER$ = Minimum dietary energy requirement.

As per the estimates, in ‘The State of Food Security and Nutrition in the World’, report, 189.2 million people are undernourished in India. By this measure 14% of the population is undernourished in India. Also, 51.4% of women in reproductive age between 15 to 49 years are anemic.

The percentage of population undernourished can be calculated using the methodology as suggested by FAO, but the state-wise data required for calculation of prevalence of under nourishment was available for the year 2011-12. Hence, the percentage of population undernourished was calculated from the available data of 2011-12 for 19 states of India published in research article authored by Dr.Vikas Rawal and for remaining states the national average of 17.9 for the year 2011-12 was used (6, 7).

Percentage of Stunted children (CST) : When a child has a low height for his/her age he/she is called stunted child, it is usually due to underfeeding, starvation and recurrent infections. The World Health Organization classifies children who are stunted as those, whose height is lower than average for their age and at least two standard deviations below the WHO’s Child Growth Standards Median. Children who are suffering from developmental retardation as a consequence of deprived diets or recurrent infections tend to be at higher probability for illness and death (UNICEF). Nutritional deficiencies for longer period of time causes Stunting that results in

deferred mental development, poor school performance and abridged intellectual capacity. This consecutively affects economic efficiency at national level. Women of short physique are at higher risk for obstetric difficulties because of a smaller pelvis. These women are at greater risk of delivering an infant with low birth weight; this becomes a great cause to the intergenerational cycle of stunting. These infants with low birth weight or immature intrauterine status probably become smaller as adults. A stunted child may also have an inferior immune system, brain utility and organ development. Performing below average in these areas may also restrict their future productivity and threaten the health of their future children.

But there are dealings by which we can take preventive measures against stunting, particularly in the first 1,000 days between pregnancy and a child’s second birthday. For stunted children, some effects can be reduced and even inverted.

Percentage of children aged < 5 years stunted for age = (number of children aged 0–59 months whose z-score falls below -2 standard deviations from the median height-for-age of the WHO Child Growth Standards/total number of children aged 0–59 months who were measured) x 100.

Percent of Wasted children (CWA) : According to UNICEF the term “wasting” refers to a situation where a child has failed to attain adequate weight for height (W/H). Weight-for height is normally used as an indicator of recent nutritional status. Wasting may be the result of malnourishment or severe disease. Wasting says something about to the process by which weakening disease causes muscle and fat tissue to “waste” away. Wasting is sometimes mentioned as “acute malnutrition” because it is had belief that events of wasting have a short period of time. Wasting can be caused by a very low energy consumption (e.g. by starvation), losses of substances that provides nourishment essential for the maintenance of active life due to infection, or a mix of low consumption

and high loss. Infections and conditions connected with wasting cover tuberculosis, chronic diarrhoea, AIDS and higher mesenteric artery syndrome.

There are 51 million wasted children in the world. India alone houses 20 million - that’s half of the world’s severely wasted children. Since 2005 in India, severe wasting in children declined from six per cent to five per cent, while wasting levels remained stagnant (19.8 per cent in 2006, 17.3 per cent in 2018) (NFHS 3 2005-06, CNNS 2016-18).

About 21 percent of children under age 5 are wasted

Table-1 : Global Hunger Index (GHI) rankings for India.

Year	GHI Values	Ranking / Out of Countries
2003	25.73	96/119
2007	25.03	94/119
2008	23.70	66/88
2009	23.9	65/84
2010	32.0	67/84
2011	23.7	67/81
2012	22.9	65/79
2013	21.3	63/78
2014	17.8	55/76
2015	29	80/104
2016	28.5	97/118
2017	31.4	100/119
2018	31.21	103/119
2019	30.3	102/117

Source : GHI annual reports, IFPRI).

(International Institute for Population Sciences, National Family Health Survey (NFHS)-4 2015-16). The national average also hides the greater burden and prevalence among certain geographic areas and population groups. Children from tribal communities have an especially high prevalence of wasting at 21.5 per cent. Severely wasted children are more likely to die because their resistance to infections is weakened by a lack of nutrients. Those who survive may go on to suffer poor growth and development and fail to thrive (UNICEF).

WFH as % of median reference value is calculated this way :

Weight for height

$$= \frac{\text{Weight of a given child}}{\text{Median weight for a given child of that height}} \times 100$$

Cut off points may vary, but <80% (close to -2 Z-score) is often used.

The proportion of children under the age of 5 having low weight for their height reflecting acute under nutrition-2 standard deviation of the WHO child growth standard median.

The recommended reporting system of height for age (H/A) and weight for height (W/H) is in terms of Z-scores — a statistical measure of the distance from the median expressed as a proportion of the standard deviation. The most common cutoff point is -2 Z-score, i.e., two standard deviations below the median values of the international reference. This is the cutoff risk level used to differentiate malnourished children from those adequately nourished. Children whose H/A and W/H scores fall below this point are therefore considered, stunted and wasted, respectively.

Table-2 : State wise values of components of GHI.

S.No.	States / UTs.	PUN	CST	CWA	CM
1.	A & N Islands	17.90	23.3	18.9	1.30
2.	Andhra Pradesh	28.13	31.4	17.2	4.08
3.	Arunachal Pradesh	17.90	29.4	17.3	3.28
4.	Assam	40.78	36.4	17.0	5.66
5.	Bihar	31.09	48.3	20.8	5.81
6.	Chhattisgarh	38.21	37.6	23.1	6.42
7.	Daman & Diu	17.90	23.4	24.1	3.40
8.	D & N Haveli	17.90	41.7	27.6	4.20
9.	Delhi NCT	17.90	32.3	17.1	4.20
10.	Goa	17.90	20.1	21.9	1.29
11.	Gujarat	44.22	38.5	26.4	4.35
12.	Haryana	28.09	34.0	21.2	4.11
13.	Himachal Pradesh	16.31	26.3	13.7	3.76
14.	Jammu & Kashmir	22.84	27.4	12.1	3.76
15.	Jharkhand	39.19	45.3	29.0	5.45
16.	Karnataka	43.69	36.2	26.1	3.22
17.	Kerala	17.90	19.7	15.7	0.71
18.	Lakshadweep	17.90	27.0	13.8	3.00
19.	Madhya Pradesh	38.15	42.0	25.8	6.49
20.	Maharashtra	36.97	34.4	25.6	2.91
21.	Manipur	17.90	28.9	6.8	2.59
22.	Meghalaya	17.90	43.8	15.3	3.97
23.	Mizoram	17.90	28.0	6.1	4.59
24.	Nagaland	17.90	28.6	11.2	3.73
25.	Odisha	34.96	34.1	20.4	4.86
26.	Punjab	28.41	25.7	15.6	3.32
27.	Puducherry	17.90	23.7	23.6	3.22
28.	Rajasthan	29.53	39.1	23.0	5.07
29.	Sikkim	17.90	29.6	14.2	3.22
30.	Tamil Nadu	48.74	27.1	19.7	2.69
31.	Telangana	17.90	28.1	18	3.36
32.	Tripura	17.90	24.3	16.8	3.26
33.	Uttarakhand	18.34	33.5	19.5	7.81
34.	Uttar Pradesh	34.45	46.3	17.9	4.67
35.	West Bengal	38.38	32.5	20.3	3.18

Percent Child Mortality (CM) : Child mortality is defined as the number of deaths of children under five years of age in a given year per one thousand children in this age group. The age constraints, however, may vary among different reports. Some researchers might consider only children between the ages of one and four years, while others might include infant mortality. Infant mortality rate cannot fully account for the effects of weakening nutritional status. Every researcher has an authority of defining child mortality prior its employment in a report before making comparisons with other indicators.

Child mortality rate is calculated as :

$$\text{Child mortality rate} = \frac{\text{no. of deaths under 5 years}}{\text{total no. of live birth}} \times 1000$$

All the 4 components were selected to monitor severity the hunger situation of India. The percentage of people who are food and energy deficient refers to entire population. Wasting, stunting, and child mortality and

these components deals with children under 5 years. This ensures that both the situation, conditions of the population as a whole and that of children particularly physiologically venerable section of a population is captured.

However, instead of per thousand child mortality values percent values are used during the present study for child mortality. The statewide data pertaining to all the above components is given in table-2.

Materials and Methods

Estimation of weights using Principal Component Analysis :

The method of Principal Components provides a convenient way of assigning proper weights to the components to form a composite index. Principal Component Analysis (PCA) has traditionally been used to transform a large set of variables into a smaller set of uncorrelated variables that account for most of the variation in the original set of variables.

The method of principal component analysis is used by various researchers for index development; some studies have used the method for deriving a suitable weighting pattern. For example, have analyzed social sector development in the major states of India with the help of suitable composite indices constructed using the method of principal components. Studies like (9) and (10) have also used the method of principal components for constructing suitable 152 indices for analyzing intra-state disparities in levels of socio-economic development.

Thus principal component analysis provides optimal weights that capture the largest fractions of the variance of the original variable based on the data available. The weight of indicator can be obtained from the following formula (11) :

$$\text{Weight of variable } x = \frac{\text{factor score of variable } x}{\text{sum of all scores}}$$

Principal component analysis was performed using the SPSS software trail version 20.

Results of Principal Component Analysis.

Correlations	Stunted	Wasted	Mortality	PUN
Stunted	1			
Wasted	0.414*	1		
Child Mortality	0.685**	0.229	1	
PUN	0.505**	0.513**	0.321	1
Anti-image Matrices	Stunted	Wasted	Mortality	PUN
Stunted	0.625a			
Wasted	-0.206	0.713a		
Child Mortality	-0.639	0.072	0.601a	
PUN	-0.294	-0.385	0.010	0.726a

* & ** Correlation is significant at the 0.05 level & 0.01 level respectively, (2-tailed) a-indicates sample adequacy.

The above table represents the correlation between

the components. The correlation between stunted & wasted, stunted & child mortality, stunted & undernourished population and wasted & undernourished population is significant with correlation coefficient 0.414, 0.685, 0.505 and 0.513, respectively. Whereas, the correlation between wasted & child mortality and child mortality and undernourished population is non-significant with correlation coefficient 0.229 and 0.321. It can be inferred that percentage of population that is undernourished has weak correlation with child mortality implicating that poor nutrition in children leads to long term deficiencies and diseases in the population and could cause death in extreme situation. However, sampling adequacy is calculated on the basis of anti-image of correlation matrix.

Kaiser-Meyer-Olkin Measure

$$= (0.625+0.713+0.601+0.726)/4$$

$$= 0.66.$$

This showed that the sample data used for the present study is fairly adequate and further statistical tools can be applied on this data.

Factor	Eignvalue	% variance	Cumulated percentage
Factor	2.35	58.71	58.71
Final statistics	Commuality	Factor score	Derived weight
Stunted	0.757	0.371	0.29
Wasted	0.466	0.291	0.22
Mortality	0.546	0.315	0.24
Undernourishment	0.579	0.324	0.25

Results and Discussion

PCA weights calculated based on data from 35 States of India showed that, the percentage of children who are stunted in India have higher weight of 0.29 and that of wasted is 0.22. The weights for child mortality under 5 years of age and the percentage of population undernourished 0.24 and 0.25 respectively. It can be concluded that the percent contribution of stunted children, undernourished population, child mortality and wasted children are 29%, 25%, 24% and 22%, respectively.

Stunting is a symptom for adverse environmental, both maternal and child health factors, including improper sanitation, restriction of intrauterine growth, micronutrient deficiencies, and inappropriate infant and young child eating habits. Current international recommendations for achieving a 20% reduction in stunting and a 61% reduction in severe wasting include delivery of a set of nutrition-specific interventions at 90% coverage level.

There are number of factors that influence stunting other than those mentioned in nutrition-specific

interventions. Antenatal care, decreased open defecation, low fertility, agriculture, clean water and sanitation, women's education and empowerment, and optimum availability of quality food have been the key factors in reducing stunting, while income growth and political system played a facilitating role.

The formulation of the hunger index is based on four components viz; Prevalence of undernourishment in the total population, stunted children under five years of age, wasted children under five of age, and mortality rate of children under five years of age. It is very important to closely monitor these components.

The problem of stunting, wasting and child mortality in children under five years of age can be prevented by ensuring that the healthy, appropriate and nutritious food is available at an affordable price to every child for consumption to achieve his or her full potential. Infants should be closely monitored for the first 1000 days of birth and essential services should be provided for pregnant and lactating women to ensure the health of the baby and the mother. Along with the healthy diet improved, processed, complementary foods as well as dairy products and supplements of iron and calcium should be incorporated in the mother's diet. Rapid and exclusive breastfeeding to new born baby, trained and experienced staff with antenatal, birth and postnatal care skills, access to nutritious foods, Family knowledge of symptoms that are harmful to a child's health, access to clean water, sanitation and vaccination can prevent most of the diseases that could cause death.

Conclusions

Results of the principle component analysis indicated the highest weight (0.29) for the percentage of stunted children in India followed by percentage of population undernourished (0.25), child mortality (0.24) and percentage of wasted children (0.22). This also suggests the percent contribution of these components is 29%, 25%, 24% and 22%, respectively. Considering the percent contributions of the components, the policies needs to be framed. The percentage of stunted children contributes to about 30% in Hunger Index for India and needs immediate attention followed by percentage of population

undernourished, child mortality and percentage of wasted children.

References

1. FAOSTAT, F. A. O. (2006). FAO statistical databases. Rome: Food and Agriculture Organization of the United Nations.
2. UNICEF. (1998). The state of the world's children: Focus on nutrition. New York: UNICEF.
3. Measham, A. R., & Chatterjee, M. (1999). *Wasting away: The crisis of malnutrition in India*. The World Bank. Retrieved from elibrary.worldbank.org
4. Svedberg, P. (2008). Why malnutrition in shining India persists. *4th Conference on Growth and Development*.
5. Wiesmann, Doris, Biesalski, H., von Grebmer, K., and Bernstein, J. (2015). Methodological review and revision of the global hunger index. Available at SSRN 2673491.
6. Rawal, V., Bansal, V., & Bansal, P. (2019). Prevalence of undernourishment in Indian States Explorations based on NSS 68th round data. *Economic and Political Weekly*, 54(15), 35–45.
7. Mohd, A., Seema, K., Amlendu, S., and Dubey, K. (2020). *Data Gap Analysis , Indicator Selection and Index Development: A Case for Developing Economies*.
8. Prabhu, K. S., & Chatterjee, S. (1993). *Social sector expenditures and human development: A study of Indian states*. Department of Economic Analysis and Policy, Reserve Bank of India.
9. Prabhu, K.S and Sarker, P.C (1992), "Identification of Levels of Development: Case of Maharashtra", Economic and political Weekly, September 5, 1992.
10. Shaban, Abdul and Bhole, L.M (1999), "Development and Disparities in Maharashtra: A Spatio-Temporal Analysis", *Indian Journal of Regional Science*, Vol.XXXI, No.1.
11. Wiesmann, D, Weingärtner, L., & Schöninger, I. (2006). *The challenge of hunger: Global Hunger Index: Facts, determinants, and trends*. Retrieved from <https://books.google.com/books?hl=en&lr=&id=40bN91xgGi8C&oi=fnd&pg=PA6&dq=hunger+index+of+india&ots=Tu8NqEdnlE&sig=miksVZBQ14yVful5HTCP5ur0rrc>
12. Bhutta, Z.A., Das, J.K., Rizvi, A., Gaffey, M.F., Walker, N., Horton, S., ... Group, T. L.N. I.R. (2013). Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? *The Lancet*, 382(9890), 452–477.
13. Smith, L., and Haddad, L. (2014). Reducing Child Undernutrition: Past Drivers and Priorities for the Post-MDG Era. *IDS Working Papers*, 2014(441), 1–47.



A Study of Hunger Situation in India Through Formulation of India State Hunger Index Using PCA

Arshi Khan^{1*}, P.V. Ubale¹ and Mohammad Sajid²

¹G.S. Science, Arts and Commerce College, Khamgaon, Maharashtra

²Dr. PDKV, Akola, Maharashtra

*Corresponding Author's Email : arshi29khan@gmail.com.

Abstract

World is facing, one of the many terrible problems which is threatening the existence of human being, a cruel hunger. Hunger is directly correlated with food production and supply. Calculation of weights, standardization of the component data and formulation of four different versions of the hunger index for 35 states of India was carried out. Mean squared error criterion and effect size analysis were adopted for ascertaining the efficiency of the indices. The percentage of children who are stunted in India is the most important component of India state hunger index. On the basis of results of mean squared error, standard error and the effect size analysis of the index versions, the approach of formulating the India state hunger index by assigning weights using principal component analysis to the non-standardized data of the components showed feasible results. According to ISHI, Kerala has the lowest value of 13.81 and Jharkhand has the largest value of the index (30.62). 16 states are categorized as moderate, 18 states are placed in serious category and the value of index for India is 26.05 and categorized in serious category.

Key words : India state hunger index, PCA, stunting, wasting.

Introduction

World is facing, one of the many terrible problems which is threatening the existence of human being, a cruel hunger. There are many faces of hunger such as loss of energy, lack of interest, increased vulnerability to disease, shortfalls in nutritional status and premature death. The development agenda has a factor of brawling with under-nutrition and hunger. Poverty reduction, food security and nutrition played a vital role to achieve the targets of millennium development goals till 2015, the people suffering from hunger will be nearly 580 million according to the recent predictions.

The same rate of child malnutrition in two countries can have very different consequences in terms of malnutrition-related deaths among children, depending on the overall rate of child mortality. Death data contains more causes of death than malnutrition, and the real contribution to malnutrition in children at death is not easy to trace because the immediate cause of death is usually an infectious disease. Malnourished adults such as children are less productive physically and mentally, receive less education and earn a living and are affected by higher rates of chronic illness and disability. The proportion of young children and older women who are shorter and underweight indicates that the prevalence of malnutrition is higher than recommended by the FAO .

Global Hunger Index (GHI) : It is a tool that measures world hunger, regionally and nationally. GHI was

developed in 2006 and first published by the International Food Policy Research Institute (IFPRI) (Source: <https://www.globalhungerindex.org/pdf/en/2020.pdf>). GHI is used to calculate hunger indices for different countries and ranks countries according to GHI scores. On a global scale, hunger and malnutrition have declined since 2000; in some parts of the world, however, hunger and malnutrition persist or even worsen in many countries. Since 2010, 16 countries have not seen any change or increase in their GHI standards.

The present study aims to formulate State Hunger Index using percentage of undernourished population (PUN), percentage of stunted children (CST), percentage of wasted children (CWA) and percent child mortality (CM) as its components. The percentage of people who are food and energy deficient (undernourished population) includes population from all age groups whereas, the other three components only consider the children up to five years of age. However, instead of per thousand child mortality values percent values are used for child mortality. The index reflects scoring by states on a 100-point scale where 0 is the best score (no hunger) and 100 the worst. A score ≥ 50 is defined as 'extremely alarming'; 35-50 as 'alarming'; 20-35 as 'serious'; 10-20 as 'moderate' and < 10 as 'low'.

The state-wise data (2011-12) required for calculation of percentage of undernourished population was used from , following FAO methodology for 19 states and for remaining states the national average of 17.9 for

Table-1 : Maximum and threshold value values of the components.

S.N.	Component	State	Year	Observed maximum value (%)	Threshold value set (%)
1.	Stunted	Bihar	1992-93	60.90	65
2.	Wasted	Madhya Pradesh	2005-06	39.50	45
3.	child mortality	Madhya Pradesh	1998-99	13.76	20
4.	Undernourishment	Tamil Nadu	2011-12	48.74	55

(NFHS Reports of respective years)

Table-2 : Factor scores and derived weights of components.

Factor statistics	Eigenvalue	Percent of variance	Cumulated percentage
Factor 1	2.35	58.71	58.71
Final statistics	Communality	Factor score	Derived weight
Stunted	0.757	0.371	0.29
Wasted	0.466	0.291	0.22
Mortality	0.546	0.315	0.24
Undernourished population	0.579	0.324	0.25

Only one factor was finally extracted by principal component analysis. (Criterion : eigen value >1).

the year 2011-12 was considered . The data pertaining to the remaining three components was taken from the 4th round of National Family Health Survey 2015-16.

Materials and Methods

It includes computation of weights to the components using principal component analysis, standardization of the components and formulation of the hunger index for Indian states.

All the components were standardized with the threshold values (Table-1). These threshold values were fixed somewhat greater than the existing maximum value of the respective component, obtained in the previous years till 2015. Greater threshold values were set to overcome the chance of increase in the existing maximum values of the components in future.

Below given formulae were used for standardization of the data of the components.

$$\text{Standardized PUN} = \frac{\text{PUN}}{\text{Threshold value (55)}} \times 100$$

$$\text{Standardized CWA} = \frac{\text{CWA}}{\text{Threshold value (45)}} \times 100$$

$$\text{Standardized CST} = \frac{\text{CST}}{\text{Threshold value (65)}} \times 100$$

$$\text{Standardized CM} = \frac{\text{CM}}{\text{Threshold value (20)}} \times 100$$

Where, PUN, CWA, CST and CM are the existing values of the respective components for the year 2015. The data of all the four components was standardized and the results are presented in the table-3.

The four hunger indices for Indian states (ISHI) were

formulated considering the combinations of principal component analysis (PCA) weights and non-standardized components, PCA weights and standardized components, weights assigned by IFPRI (1/3,1/6,1/6,1/3 for PUN, CST, CWA and CM, respectively.) and non-standardized components, weights assigned by IFPRI and standardized components. Below given formulae were used for the formulation of four different versions of India State Hunger Index as per above combinations.

$$\text{ISHI}_{(1)} = (\text{PCA weight}) \times \text{PUN} + (\text{PCA weight}) \times \text{CWA} + (\text{PCA weight}) \times \text{CST} + (\text{PCA weight}) \times \text{CM}$$

$$\text{ISHI}_{(2)} = (\text{PCA weight}) \times \text{Std. (PUN)} + (\text{PCA weight}) \times \text{Std. (CWA)} + (\text{PCA weight}) \times \text{Std. (CST)} + (\text{PCA weight}) \times \text{Std. (CM)}$$

$$\text{ISHI}_{(3)} = (\text{IFPRI weight}) \times \text{PUN} + (\text{IFPRI weight}) \times \text{CST} + (\text{IFPRI weight}) \times \text{CWA} + (\text{IFPRI weight}) \times \text{CM}$$

$$\text{ISHI}_{(4)} = (\text{IFPRI weight}) \times \text{Std. (PUN)} + (\text{IFPRI weight}) \times \text{Std. (CWA)} + (\text{IFPRI weight}) \times \text{Std. (CST)} + (\text{IFPRI weight}) \times \text{Std. (CM)}$$

Mean squared error criterion and effect size analysis were adopted for ascertaining the efficiency of the indices.

Results and Discussion

Principal component analysis (PCA) : Weights for all the components were calculated using principal component analysis which resulted in 0.25, 0.29, 0.22, and 0.24 for undernourishment, stunted, wasted and child mortality, respectively, with 0.67 sampling adequacy.

Formulation of India State Hunger Index (ISHI) :

1. The India state hunger index (ISHI(1)) is formulated by assigning weights calculated based on PCA to the non-standardized data of the components. Numerically it can be expressed as;

Table-3 : Components of ISHI and its standardized values.

States / UTs	(PUN)	Std (PUN)	CST)	Std (CST)	CWA)	Std (CWA)	(CM)	Std (CM)
A and N Islands	17.90	32.55	23.3	35.85	18.9	42.00	1.30	6.50
Andhra Pradesh	28.13	51.15	31.4	48.31	17.2	38.22	4.08	20.40
Arunachal Pradesh	17.90	32.55	29.4	45.23	17.3	38.44	3.28	16.40
Assam	40.78	74.15	36.4	56.00	17.0	37.78	5.66	28.30
Bihar	31.09	56.52	48.3	74.31	20.8	46.22	5.81	29.05
Chhattisgarh	38.21	69.48	37.6	57.85	23.1	51.33	6.42	32.10
Daman and Diu	17.90	32.55	23.4	36.00	24.1	53.56	3.40	17.00
D and N Haveli	17.90	32.55	41.7	64.15	27.6	61.33	4.20	21.00
Delhi NCT	17.90	32.55	32.3	49.69	17.1	38.00	4.20	21.00
Goa	17.90	32.55	20.1	30.92	21.9	48.67	1.29	6.45
Gujarat	44.22	80.40	38.5	59.23	26.4	58.67	4.35	21.75
Haryana	28.09	51.07	34.0	52.31	21.2	47.11	4.11	20.55
Himachal Pradesh	16.31	29.65	26.3	40.46	13.7	30.44	3.76	18.80
Jammu and Kashmir	22.84	41.53	27.4	42.15	12.1	26.89	3.76	18.80
Jharkhand	39.19	71.25	45.3	69.69	29.0	64.44	5.45	27.25
Karnataka	43.69	79.44	36.2	55.69	26.1	58.00	3.22	16.10
Kerala	17.90	32.55	19.7	30.31	15.7	34.89	0.71	3.55
Lakshadweep	17.90	32.55	27.0	41.54	13.8	30.67	3.00	15.00
Madhya Pradesh	38.15	69.37	42.0	64.62	25.8	57.33	6.49	32.45
Maharashtra	36.97	67.21	34.4	52.92	25.6	56.89	2.91	14.55
Manipur	17.90	32.55	28.9	44.46	6.8	15.11	2.59	12.95
Meghalaya	17.90	32.55	43.8	67.38	15.3	34.00	3.97	19.85
Mizoram	17.90	32.55	28.0	43.08	6.1	13.56	4.59	22.95
Nagaland	17.90	32.55	28.6	44.00	11.2	24.89	3.73	18.65
Odisha	34.96	63.56	34.1	52.46	20.4	45.33	4.86	24.30
Punjab	28.41	51.65	25.7	39.54	15.6	34.67	3.32	16.60
Puducherry	17.90	32.55	23.7	36.46	23.6	52.44	3.22	16.10
Rajasthan	29.53	53.69	39.1	60.15	23.0	51.11	5.07	25.35
Sikkim	17.90	32.55	29.6	45.54	14.2	31.56	3.22	16.10
Tamil Nadu	48.74	88.62	27.1	41.69	19.7	43.78	2.69	13.45
Telangana	17.90	32.55	28.1	43.23	18	40.00	3.36	16.80
Tripura	17.90	32.55	24.3	37.38	16.8	37.33	3.26	16.30
Uttarakhand	18.34	33.35	33.5	51.54	19.5	43.33	7.81	39.05
Uttar Pradesh	34.45	62.63	46.3	71.23	17.9	39.78	4.67	23.35
West Bengal	38.38	69.77	32.5	50.00	20.3	45.11	3.18	15.90
India	36.38	66.15	38.4	59.08	21.0	46.67	5.00	25.00

$$ISHI_{(1)} = 0.25 \cdot PUN + 0.22 \cdot CWA + 0.29 \cdot CST + 0.24 \cdot CM$$

ISHI₍₁₎ coins the value of 13.81 for Kerala (Table-4), which is least amongst all, followed by 16 states in moderate category. Apart from this, other 18 states are placed in serious category with the largest value of the index (30.62) for Jharkhand. The value of index for India is 26.05 and categorized in serious category.

2. The India state hunger index (ISHI(2)) is formulated by assigning weights calculated based on PCA to the standardized data of the components. Numerically it can be expressed as;

$$ISHI_{(2)} = 0.25 \cdot \text{Std.}(PUN) + 0.22 \cdot \text{Std.}(CWA) + 0.29 \cdot \text{Std.}(CST) + 0.24 \cdot \text{Std.}(CM)$$

ISHI₍₂₎ represents that Kerala is leading with index value 25.45, whereas, Jharkhand, Madhya Pradesh, Gujrat, Chhattisgarh and Karnataka lies in the bottom section with index values 58.74, 56.48, 55.40, 53.14, 52.82, respectively and are placed in the extremely alarming category (Table-4). The upper section of the index list belongs to the serious category and middle section lies in the alarming category. The index value for India is 49.94, which falls in alarming category.

3. The India state hunger index (ISHI(3)) is formulated by assigning weights as suggested by IFPRI to the non-standardized data of the components. Numerically it can be expressed as;

$$ISHI_{(3)} = 1/3 \cdot PUN + 1/6 \cdot CST + 1/6 \cdot CWA + 1/3 \cdot CM$$

Comparatively lesser index values were obtained for

Table-4 : India State Hunger Index (ISHI).

S.N.	States / UTs	ISHI ₍₁₎	ISHI ₍₂₎	ISHI ₍₃₎	ISHI ₍₄₎
1.	Kerala	13.81	25.45	11.20	21.26
2.	Manipur	14.97	27.46	11.88	23.46
3.	Mizoram	15.04	29.12	12.28	26.30
4.	Goa	15.43	29.36	12.50	24.63
5.	Himachal Pradesh	15.62	30.36	13.36	27.97
6.	A and N Islands	15.70	29.33	12.53	24.35
7.	Tripura	16.00	31.10	13.00	27.10
8.	Lakshadweep	16.06	30.53	12.87	26.25
9.	Nagaland	16.13	30.85	12.94	26.91
10.	Sikkim	16.96	32.15	13.44	27.43
11.	Jammu and Kashmir	17.22	33.03	15.45	31.62
12.	Puducherry	17.31	34.11	14.02	29.40
13.	Daman and Diu	17.38	34.44	14.12	29.80
14.	Telangana	17.39	33.51	13.87	28.68
15.	Arunachal Pradesh	17.59	33.65	13.94	28.62
16.	Delhi NCT	18.61	35.95	14.70	30.83
17.	Punjab	18.78	35.99	17.46	35.12
18.	Uttarakhand	20.47	42.19	17.55	39.95
19.	Andhra Pradesh	20.90	40.10	18.84	38.27
20.	Meghalaya	21.50	39.92	16.24	32.73
21.	Haryana	22.53	43.23	19.93	40.44
22.	D and N Haveli	23.65	45.27	18.02	37.13
23.	West Bengal	24.25	45.68	22.65	44.41
24.	Odisha	24.28	46.91	22.36	45.59
25.	Rajasthan	25.00	48.20	21.88	44.89
26.	Tamil Nadu	25.02	47.11	24.94	48.27
27.	Maharashtra	25.55	48.16	23.29	45.56
28.	Assam	25.85	49.88	24.38	49.78
29.	Chhattisgarh	27.08	53.14	24.99	52.06
30.	Uttar Pradesh	27.10	50.65	23.74	47.16
31.	Bihar	27.75	52.82	23.82	48.61
32.	Karnataka	27.94	52.63	26.02	50.79
33.	Madhya Pradesh	28.95	56.48	26.18	54.26
34.	Gujarat	29.07	55.40	27.01	53.70
35.	Jharkhand	30.62	58.74	27.26	55.19
	India	26.05	49.94	23.69	48.01

all the states in this version (Table-4). It follows the same pattern as that of first two versions of the index. Kerala is at the top in the list with index value 11.20 followed by Manipur (11.88), Mizoram (12.28) and Goa (12.50) under moderate category. Jharkhand (27.26) is at the bottom of the list. The first 16 states of the list are in the moderate category and the remaining states are in serious category.

4. The India state hunger index (ISHI₍₄₎) is formulated by assigning weights as suggested by IFPRI to the standardized data of the components and numerically it is expressed as;

$$ISHI_{(4)} = 1/3 \cdot \text{Std.}(PUN) + 1/6 \cdot \text{Std.}(CWA) + 1/6 \cdot \text{Std.}(CST) + 1/3 \cdot \text{Std.}(CM)$$

The index value for India is 48.01 belonging to alarming category. Being the lowest value (21.26), Kerala

is on the top with serious category, followed by Manipur, Andaman and Nicobar Islands, and Goa. The highest value is 55.19 for Jharkhand which is in the extremely alarming category of the list (Table-4).

Efficiency of the model : Mean squared error (MSE) and standard error (SE) estimate were calculated for all the four index versions using regression analysis (Table-5).

The minimum mean squared value was obtained for ISHI₍₃₎ followed by ISHI₍₁₎, ISHI₍₂₎ and ISHI₍₄₎. On the contrary the standard error estimate (SE) indicated lowest value for ISHI₍₁₎. The mean squared values for ISHI₍₁₎ and ISHI₍₃₎ are in close proximity and to find the superior one the effect size for ISHI₍₁₎ and ISHI₍₃₎ was calculated. The effect size is calculated by squaring the Pearson's correlation coefficient r .

Table-5 : Mean squared error (MSE) and standard error (SE) estimate.

	ISHI ₍₁₎	ISHI ₍₂₎	ISHI ₍₃₎	ISHI ₍₄₎
MSE	218.39	805.31	210.753	840.211
SE	0.00246	0.00275	0.00274	0.00254

Table-6 : Effect size of ISHI₍₁₎ and ISHI₍₃₎.

Indices	Effect size				Combined effect size
	Stunted	Wasted	Mortality	Undernourished population	
ISHI ₍₁₎	0.692	0.477	0.338	0.750	2.257
ISHI ₍₃₎	0.549	0.437	0.284	0.876	2.146

ISHI₍₁₎ is having greater effect size for all the components as compared to ISHI₍₃₎, excluding undernourished population. The combined effect size is also greater for ISHI₍₁₎, hence, on the basis of mean squared error and the effect size of the indices, it can be concluded that the ISHI₍₁₎ is the most appropriate method of calculating the state level hunger index in India.

Principal component analysis revealed that the percentage of children who are stunted in India is the most important component of state hunger index. The approach of formulating the India State Hunger Index with PCA weights and non-standardized components (ISHI(1)) showed feasible results. This method of calculation is simple, the weights computed using PCA are based on the actual data of the components of hunger index and does not include the tedious procedure of standardization. This combination of components and weights gives reasonable values of the index as compared to other versions.

Nearly similar ranks are obtained for all the states from all the four versions of the index. However, as per the ranks obtained from ISHI(1) the states like Jharkhand, Gujarat, Madhya Pradesh, Chhattisgarh, Karnataka, Bihar and Uttar Pradesh, laying at the bottom section of the rankings needs to be concentrated and requires immediate attention to reduce the hunger problem.

The problem of child stunting, wasting and mortality below five years can be prevented by ensuring that the healthy, appropriate and nutritious food is available at an affordable price to every child for consumption to achieve his or her full potential. Pregnant women and infants should be closely monitored up to 1000 days and nutritious ample food should be provided for pregnant and lactating women to ensure the good health of the baby

and the mother. Awareness regarding rapid and exclusive breast feeding to new born baby, availability of trained and experienced staff with antenatal, birth and postnatal care skills at remote and rural areas. Awareness and knowledge about the harmful symptoms affecting infant and child health to remote and rural population. Similarly, access to clean drinking water, sanitation and timely vaccination can prevent most of the diseases that cause death of the infants and children. All these efforts will definitely help to reduce the hunger problem of the Indian states.

References

1. Mohd A., Seema K., Amlendu S. and Dubey K. (2020). Data Gap Analysis, Indicator Selection and Index Development: A Case for Developing Economies.
2. Pelletier H., Sawaya M.R., Kumar A., Wilson S.H. and Kraut J. (1994). Structures of ternary complexes of rat DNA polymerase beta, a DNA template-primer, and ddCTP. *Science*, 264(3): 1891–1903.
3. Rawal V., Bansal V. and Bansal P. (2019). Prevalence of undernourishment in Indian States Explorations based on NSS 68th round data. *Economic and Political Weekly*, 54(15): 35–45.
4. Svedberg P. (1999). 841 Million Undernourished? *World Development*, 27(12): 2081–2098.
5. <https://econpapers.repec.org/RePEc:eee:wdevel:v:27:y:1999:i:12:p:2081-2098>
6. UNICEF (1998). The state of the world's children : Focus on nutrition. *New York: UNICEF*.
7. Wiesmann D., Weingärtner L. and Schöniger I. (2006). *The challenge of hunger: Global Hunger Index: Facts, determinants, and trends*.
8. <https://books.google.com/books?hl=en&lr=&id=40bN91xgGi8C&oi=fnd&pg=PA6&dq=hu>
9. [hunger+index+of+india&ots=Tu8NqEdnIE&sig=miksVZBQ14yVful5HTCP5ur0rrc](https://www.google.com/search?q=hunger+index+of+india&ots=Tu8NqEdnIE&sig=miksVZBQ14yVful5HTCP5ur0rrc)



IJCS PUBLICATION (IJCSPUB.ORG)

INTERNATIONAL JOURNAL OF CURRENT SCIENCE (IJCSPUB)

An International Open Access, Peer-reviewed, Refereed Journal

SIX SIGMA IN BANKING PROCESS: PAST, PRESENT AND FUTURE.

Dr. V.S.Athawar, G.S. Science ,Arts& Commerce College Khamgaon.

Abstract: The purpose of this research paper is to explore Six Sigma in Service Sector Specially in Banking Process. Six Sigma is a very powerful tool to reduce waste and enhance the service process. Though its benefits are limited in service sector rather than manufacturing process. Six sigma deployed in Service sector based on valued and non valued added process. Six sigma can be used in service sector such as banking and health care. This research paper focuses on key performance indicator of six sigma in various stages to cover wide range of Service process specially in Vidharbha region..

Design/Methodology/Approach: The tactic is to create the practical experience and research conducted by the author on six sigma in banking process. Further analysis shows the changing in implementing Six Sigma in banking by using primary as well as secondary data.

Finding: Here a new approach has been developed to reach the six sigma level so that customer will be satisfied. DMAICM is the new approach of Six sigma methods the leading new phase and its affection and reality will be described by using primary as well as secondary data.

Practical Implication: This research paper is used for academic who are really interested in six sigma process. This paper provide a new concept past, present and future of Six sigma in Service sector. Further this paper express the new approach on systemic ways for implementing the process in service sector.

Key words: Six Sigma, Implementation of Six sigma in Banking, DMAICM process, Banking Process and Continuous improvement.

1. Birth of Six Sigma and Introduction:

Six Sigma is the business management strategy or process improvement approach pioneered in the 1980 by Motorola to reduce manufacturing errors. Later in the mid-Nineties it was adopted by General electric and Allied Signal. Now finding its ways into non manufacturing profession like banking sector, health care, service sector, real estate etc.

The goal of six sigma is to eliminate or at the very least, minimize the number of errors in a process. The term sigma has not been used much in ordinary conversation. At most people are aware, the lower case

Greek letter sigma 'σ' is used to signify standard deviation. SD is a statistical way to describe how much variation exists in a set of data, a group of items, or a process.

Six sigma is the philosophy, a measure, and a methodology that provides business with the perspective and the tools needed to achieve high level of performance for both product and service offering. The philosophy of six sigma involve two aspects one is statistical, other is business strategy, from the statistical point of view, the focus is on defect per million opportunities(DMPO), and the standard of performance is 3.4 DPMO or 99.9996% error free work.

From the business point of view, six sigma is the disciplined method of using extremely rigorous data gathering and statistical analysis to pin point source of errors and ways of elimination them. The two key methodologies used in six sigma are DMAIC stands for Define, Measure, Analyze, Improve and Control and the second is DMADV stands for Define, Measure, Analyze, Design, verify. DMAIC is used when improving an existing product or process where as DMADV is employed when developing a new product or process.

Six sigma is a powerful quality process used in finance industry. Many financial institutions use six sigma methodology for improving the accuracy of allocation of cash to reduce bank charges, automatic payment, accuracy of reporting, reducing documentary credits defects, reducingcheque collection defects and reducing variation in collector performance. Many banks have attained the greater performance goals after implementing Six sigma.

Jiju Antony 2004 [10] stated that Six Sigma process was pioneered by Bill Smith at Motorola in 1986. It is evident that Bill Smith did not really invent [10]. Six Sigma in the year 1980s; rather he applied methodologies that had been available since in 1920s developed by luminaries like Shewhart, Deming, Juran, Ishikawa, Taguchi, and Shainin. All tools used in Six Sigma programs are actually a subset of the Quality Engineering Discipline.

1.2 Definition :- Six Sigma

(Sunil Desale, S V Deodhar 2013)[19]define that it is the quality system as collective plans, activities, and events designed to ensure that the products, processes, and services satisfy customer needs. In short, Six Sigma is a customer-focused approach to business that provides an overall framework for quality management.

1.3 Six Sigma has two major methodologies.

Paul Purnendu et al. June 2011[17] illustrated two methods that are DMAIC and DMADV. DMAIC is used to improve an existing business process and DMADV is used to create new product designs or process designs in such a way that it results in a more predictable, nature defect free performance [52].

i) DMAIC

D- Define, M- Measure, A- Analyze, I- Improve, C- Control

ii) DMADV

DMAIC :- DMAIC is based on original PDCA Plan Do Check Act cycle. However, DMIAC is used for application of both efforts - improvement of processes and design/redesign of processes.

"DMAIC projects

2. Literature Review: Past Stage

Some literature on quality management and improvement philosophy are specially designed to improve quality of product in manufacturing unit. However the key principal of quality management could be implemented successfully in the service sector, banking sector, financial sector etc. such quality issues can be better dealt with quality improvement techniques. AverbaukhE[2] indicated that six sigma has the potential to produce better result in financial sector. In this research we desire to briefly compare the manufacturing and service application of six sigma. In service sector, measurement is often an overlooked area and therefore improvement quality is not ad equality addressed by many service oriented business. Brewer P & eighmeJ[3], that it is just as well suited to be applied in the service industry. The concept of service goes back to 1950,s there is still no proper definition of service. Service as being rendered and experienced. The most widely used definition is the one based on the characteristics of intangibility, heterogeneity, inseparability and perish ability. This fact is mirrored in numerous attempts to establish a unique definition (Gagger. F & Gentile, E 2008) [7]. Six sigma can either be implemented as a company wise strategy based on a management driven top- down approach(Kwale Y h & Anhari frank 2006) [12] or as an process oriented improvement methodology(Antony,J. and Banuelas,R 2001)[1]. Although six sigma was mainly developed in manufacturing industries, the concept enters in the service sector

Six sigma is the quality techniques developed and introduced by Bill smith at Motorola in 1986, to identify and eliminate defects in a manufacturing process. As the company winning the Malcolm Baldrige award two years later i.e. 1989. Many of the company have implemented the six sigma project. The list of organization that have embraced the practice include, General electric, Honey well,3M, Air Canada, caterpillar, Dell, EMC. Lockheed Martin, DHL, Samsung groups, Siemens', AG, and many others. The analytic technique of six sigma is based on statistical methods and techniques to identify the problems and sources of error, and ultimately to design a solution that will eliminate the errors.

3. Review of Literature: Banking

The methods, tools and techniques of Six Sigma strategy which have greater impact on quality improvements and performance in various Banking Industries are described, Lixia Wang 2011 [13]. The study examines the gainful effects of the knowledge management and also gives a critical analysis of the impact of Six Sigma on banking performance and customer service. The study describes that the quality assurance practice, like Six Sigma with knowledge management can be more effective strategy of banking sector in China.

The diffusion of cross functional process improvement team is used in a multinational bank of Six Sigma program. The study was carried out in three major banks namely consumer, corporate, and private bank within US, David Strang and don-II Jung 2009 [5]. Cox partial like hood method has been used to analysis

the data which removes the common temporal variation and shows the relationship between business and unit characteristic and the rate of quality team formation.

Here, it means that if you want to improve quality of processes and to achieve to best process which operates without an error. For process improvement it has been decided to use Six Sigma philosophy and DMAIC model. It can also help to improve the service processes. Here, different types of method can be used such as SIPOC, CTQ, Tolerance Limit, control charts etc to improve the service in banking sector, Vojislav Stoilkovic, Pedja Milosavljevic and Sasa Randjelovic July 2010 [20].

Gregor Zellner, Susanne Leist, et al. 2012 [8] focuses on the selection of critical processes for a Six Sigma project in teaching case. It presents an approach established during the prototypical implementation of Six Sigma at an automotive bank and individual steps of the selection process are closely determined. By Analytical Hierarchy Process a tree is formed and the relation between core competence and critical process has been determined. The success factors appear as sub goals in the AHP tree.

The impact of service quality variables is examined on each multidimensional model of customer behavioral intentions is analyzed through multiple regression analysis, Dr. K. Ravichandran, Ms. K. Bhargavi, Mr. S. Arun Kumar Nov 2010 [6]. More over the result of the t-test conforms that partial regression coefficient are highly significant and Multiple R shows that there exist relationship between Attitudinal loyalty and service quality variables like convenient operating hours of bank, modern looking equipments, delivering error free records and employees giving personal attention where the dominant variables that increase the attitudinal loyalty among customers of public retail banks.

The process described the different ways to get the customers satisfaction. The discussion indicates that customer satisfaction vary according to the nature of service, Salman Khalid Muzaffar Abbas Babak Mahmood Shabbir Hussain Nov 2011 [18]. In this case, the highest customer satisfaction is demonstrated in the responsiveness area such as willingness to help customer, friendly attitude of staff, customer guidance, and customer support. The study perceives highest satisfaction in the responsive area and lowest in tangible area. So it is necessary that bank manager redesign their service quality and their strategies about customer satisfaction.

One Bank Strategy for Growth through Six Sigma by Janet Jacobsen Sept 2008 [9] described the four phases of Six Sigma. First phase is improvement team, which eliminate the process and product variations. Second phase focusing on fixing process for new account opening, e-statement and on line banking processes quickly followed. Once the concept of continuous improvement was securely rooted in the bank's culture and required data points were in place, the employ shifted to phase three and now continue to use Six Sigma successfully to keep the financial institution lean and strong

3. Present stage

In current or present state, the today's aspect of six sigma includes for service sector such as Banking, Health Care, Hospitals, LIC and Libraries.

3.1 Six Sigma in banking

This chapter includes the concept of DFFS which has been described. It also synthesizes the literature of CSF, CTQ and KPI. The banking sectors are so significant in rapidly changing scientific world. Man as a customer expects quick facilities from banks existed in the world. That is why to measure the performance of the banking process an improved version of DMAIC is developed that is DMAICM. It is prominently expected that the banking service should provide a good quality of service to meet the customer expectation. When the process is under control, its performance can be verified and maintained by feedback of the customers. Customer satisfaction data has been collected by sample survey from various banks of three places which is applied to SQC.

3.2 Maintain

To meet customer satisfaction this improved method (DMAICM) plays an important role that reflects the financial benefits to banking sector. In this method all the six phases play a vital role collectively. So, it is necessary to maintain the standard of level of each and every phase so that it will be executed in increasing rate. So, to keep in control it is necessary to maintain all the phases under control by taking feedback of customer in every month, and the views of employees what so ever required to change are considered to make it possible to meet the customer requirement. Only feedback of customer will maintain the process. The bank would develop its internal process of working when customers actually take part in the banking process. Their suggestion, opinion and feedback appear helpful to upgrade the banking functions. They are also remarkable for fast transaction process.

3.3 Six sigma in Library

The Six Sigma is such a process that gives extra benefits to Information Technology Infrastructure Library (ITIL) and it helps to give best practice in organizations for service delivery by a quality process which ensures its successful implementation, Mohammad Aazadnia and Mehdi Fasanghari 2016 [16]. In particular, its business orientation will ensure that service improvement activities are focused on dealing those services that impact the customer. As a result, the impact that ITIL has on the business overall will be greater. It came to know that, ITIL and Six Sigma appear to be mutually exclusive. It is stated that Six Sigma and ITIL are highly complementary and its combination can be used more effectively to improve business processes. The most important point for combining the Six Sigma and ITIL to get the best service in the Six Sigma and ITIL Process are optimization, continuous improvement, measuring quality of service and process improvement, and maximizing the payback of Information Technology organizations with finding the best services.

Six Sigma is widely used for manufacturing as well as service sector also. Though it is less applied in Indian libraries process so it would not be justifiable to say that this process is not applicable in libraries.

The past case studies produce good results. However, implementation of six sigma by experts is a big necessity (Pawan R Agrawal 2012) [21].

Six Sigma is an integrative management strategy with total quality control that uses statistic measure called 'sigma' to evaluate all the quality levels quantitatively under the strong leadership of CEO, provides efficient quality control environment including problem-solving process and professional training, and promotes quality innovation and customer satisfaction. It evaluates process, determines priority of the quality improvement activities and efficiently controls the process according to the priority. Libraries in the process of applying Six Sigma must perceive the factor that satisfies users as an ideal quality and try to find key factors that affect quality from users' point of view. Moreover, libraries are made to collect objective and reliable data and employ methods of statistic analysis in order to gather data and information within the organization and use them for decision-making. As a characteristic of library service, however, there are generally distributed factors which are impossible to control or hard to quantify. Therefore, it is necessary to consider the respect that it is difficult to define problems of the current service and users' complaints. Accordingly, in drawing and implementing improvement plans, it is needed to separately prepare a process modeling for the field of library management, which is different from general manufacturing. In this study, Six Sigma theory is used in order to review various aspects of library management, conduct evaluation and find a service process necessary for improvement to raise customer satisfaction. In addition, it suggests what should be done in the future in association with strategies and visions for library management (DChinnadurai 2014) [4].

Here in Library Sixsigma helps to improve the execution process which helps to make satisfaction. It is helpful for better management to execute the library service which make library user satisfaction. As per the need and requirement of library Six sigma methodology is beneficial but it require skill and knowledge to implement the Six Sigma Process (Mahesh M Kadhe. etal 2014)[15].

3.4 Six Sigma in LIC

In summary, our findings show that large companies face many obstacles Overcome to achieve modernization and stay competitive; it is possible adapting them without weakening their original strength. However, as our case study this makes it clear that there is no out-of-the-box way to meet the challenges of this endeavor. Inevitably poses. Each company must carefully analyze its prior situation One can think of what ideas and tools can be useful from which point of view Combine to achieve his goals and stay ahead of the competition.(Kai Sandner1 etal. 2020) [11].

4. Future of Six Sigma

The world is growing so fast and there appears a lot of newest achievements and exercises in the world. The year 1987 became so important for having introduced Six Sigma by Motorola. Today Six Sigma proves to be application that is more successful. As a result quality is undoubtedly improved. Both Government and private sectors are effectively making a use of six Sigma in their routine work. It has minimized delivery times and strengthened the better relationships with its customers. The inclination of customers towards organizations has been positively enhanced. Customer satisfaction has been really increased. The outgrowth of six Sigma has become the chief assets of many people in the world. Six Sigma has been hugely used by all kinds of organizations like public health services, government organizations, banking sectors, non-government organizations, education, Post office, Library Science etc. The applications of Six Sigma would be used till the human wants grow and opportunities will be created.

4.1 Recommendation

For implementation of Six Sigma principle in Vidharbha region especially in nationalized banking, industry the following point should be strictly considerable.

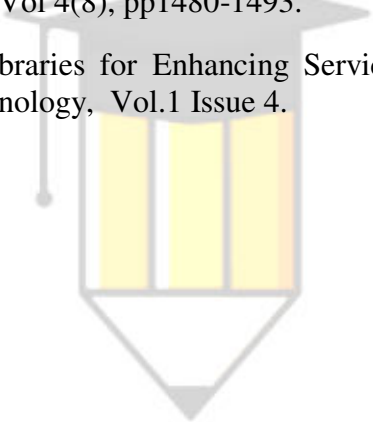
- 1) Staff training should be organized with the customer once in a year and be updating time to time with new technology in banking industry.
- 2) Providing good network system to avoid inconsistency in work process and performance.
- 3) Service quality should be monitored by customer feedback, which represents satisfaction level.
- 4) Banking service must be paperless and eco-friendly for that new technological concept must be adopted to reduce the processing time.
- 5) Six Sigma is a flexible and changed driven phenomenon, which is not rigid to approach the service quality in banking sector.
- 6) Steps wise processing time should be allotted to loan process.
- 7) Attractive Scheme must be launched to attract the customer so that banking business will be flourished.

Conclusion: The work continuous improvement to prove context in Vidharbha region on future will be. Here it is observed that critical thinking, commitment of top management, employees view to make improvement will improve the services and helps to give strength to organizations. In every sphere, Six sigma process and method is applicable but one of the most important limitations is of collection of data. This is the new approach DMAICM to Six Sigma Method considering service process and process capability which will be very effective to maintain the standard.

References:

1. Antony, J. and Banuelas, R., (2001), A strategy for survival, Manufacturing engineer, vol. 80, No. 3, PP. 119-21.
2. Averbaukh E, Six sigma trend Six sigma in financial service, www.sixsigma-24.de.
3. Brewer P & Eighme J, Using six sigma to improve the finance function, Strategic Finance, 86 (7), pp 27-33.
4. D Chinnaduri 2014 Six sigma Application in Library Service e-library Science research Journal, Vol 2,
5. David Strang and don-II Jung 2009, organization Study, Participator Improvement at a global bank :The diffusion of quality teams and the demise of a six sigma Initiative, Sage publication, London 30(01): 31-53)
6. Dr. K. Ravichandran, Ms. K. Bhargavi, Mr. S. Arun Kumar, November 2010, Influence of Service Quality on Banking Customers Behavioural Intentions, International Journal of Economics and Finance, Vol. 2, No. 4,
7. F & Gentile, E 2008, six sigma methodology an effective tool for quality management,, International journal of manufacturing Technology and management, 14 (3/4), 1.
8. Gregor Zellner, Susanne Leist, et al., 2012, Selecting Critical Processes For A Six Sigma Project – Experiences From An Automotive Bank, 18th European Conference on Information System
9. Janet Jacobsen, Sept 2008, One Bank's Strategy for Growth Through Six sigma, The American Society for quality
10. Jiju Antony Caledonian Business School, Glasgow Caledonian University Glasgow, UK, 2004, Six Sigma in the UK service organizations: results from a pilot survey by jiju Antony, Managerial Auditing Journal, Vol. 19 No. 8.
11. Kai Sandner et al., 2020, Framework for the insurance industry insight and lessons learned from a case study, Journal of Business Economics.

12. Kwale Y h & Anhari frank, 2006, Benefits, Obstacles, & future of six sigma approach , www.sciencedirect.com, Technovation 26, pp 708 – 715,
13. Lixia Wang, Feb-2011, Banking Sector Growth in China: Can Six-Sigma Be Solution,, International Journal of Business and management ,Vol 6, No2
14. Lixia Wang, Feb-2011, Banking Sector Growth in China: Can Six-Sigma Be Solution, International Journal of Business and management, Vol 6, No.2),
15. Mahesh M Kadbe et.al 2014, Six Sigma in Academic Libraries, International Journal of Researches in Social Science and Information Studeies.
16. Mahmoud DehghanNayeri, MaliheRostami, 2016, Effectiveness of six sigma methodology through BSC in Banking Industry, Asian Economic and Social Society, Vol 6, Issue 1, PP 13-21.
17. Paul Purnendu, Bose K Swapan, and Dhalla S Rizwan, June 2011, Progress in TQM & Indian Banking Performances, International Journal of Innovation, Management and Technology, Vol. 2, No. 3.
18. Salman Khalid Muzaffar Abbas Babak Mahmood Shabbir Hussain, November 2011, Customer Satisfaction with Service Quality in Conventional banking in Pakistan: The Case of Faisalabad, International journal of Marketing Studies, Vol.3, No. 4.
19. Sunil V Desale, S V Deodhar, 2013, An Application of Lean and Six sigma Principle for Constructional Process Improvement in Indian Organizations, Indian Journal of Applied Research, Vol. 3, Issue 4.
20. Vojislav Stoiljkovic, Pedja Milosavljevic and Sasa Randjelovic, July 2010, Six Sigma Concept with Banking System, African Journal of Business Management, Vol 4(8), pp1480-1493.
21. Pawan R. Agrawal 2011, Application of Six sigma in Libraries for Enhancing Service Quality , International Journal of Information dissemination and Technology, Vol.1 Issue 4.



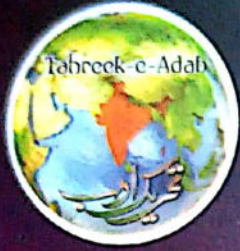
IJCS PUBLICATION (IJCSPUB.ORG)

UGC Care Listed

شماره ۵۳ (جلد اول تا چهارم ۲۰۲۱ء)

تہریک ادب

ISSN 2322-0341



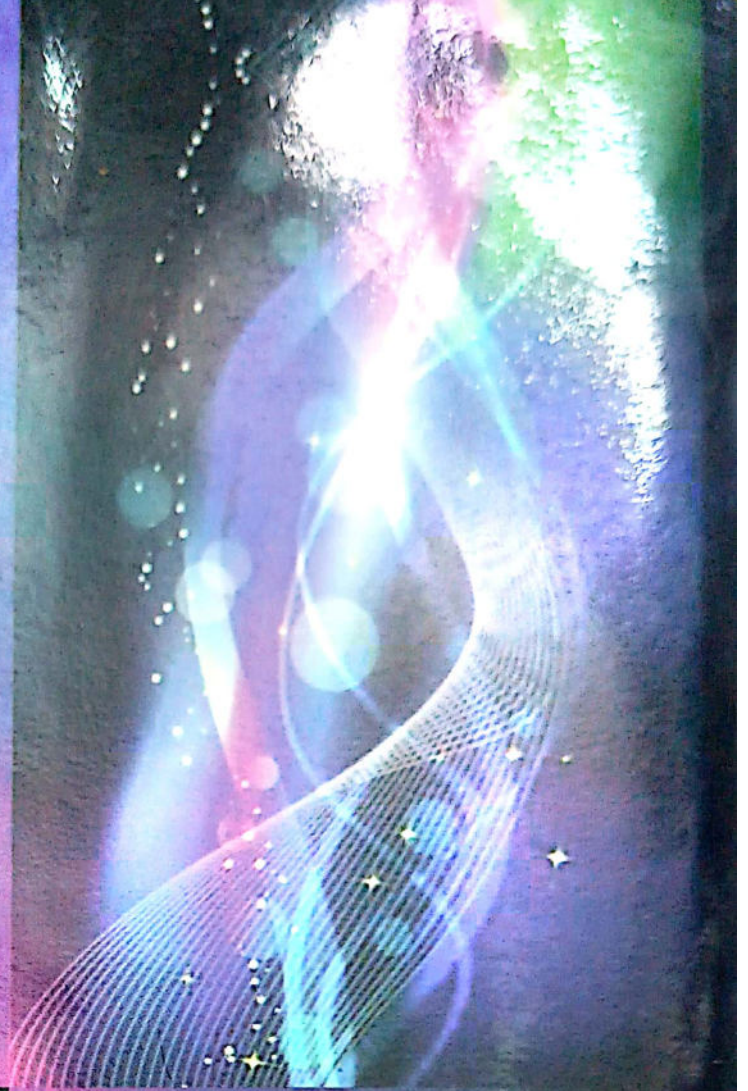
A Peer Reviewed,
Referred Literary And Research Journal

website: www.tahreekeadab.com

e-mail: tahreekeadab2008@gmail.com

e-mail: jaweanwar@gmail.com

Cell: +91-9935957330



مدیر

جاوید انور

گوشہ



پروفیسر ڈاکٹر شیخ عقیل احمد



بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

تحریک ادب

شماره 53 (جولائی تا ستمبر 2021) جلد نمبر 14

Tahreek-e-adab vol-14, issue-53 ,july to sep.2021

مجلس ادارت

Editorial board and Peer Review committee

پروفیسر صغیر افراہیم، سابق صدر شعبہ اردو، علی گڑھ مسلم یونیورسٹی

Prof. Sagheer Afrahim Ex.Chairman Dept.of Urdu A.M.U.

پروفیسر شہاب عنایت ملک، شعبہ اردو، جموں یونیورسٹی

Prof. Shohab Inayat Malik, Ex. H.O.D.Dept of Urdu

University of Jammu

ڈاکٹر شمس کمال انجم، صدر شعبہ عربی و اردو، بابا غلام شاہ بادشاہ یونیورسٹی

Dr. Shams Kamal Anjum, H.O.D. Dept.of Urdu Arabic And

Islamic Studies, Baba Ghulam Shah Badshah University

ڈاکٹر عبدالرشید منہاس، سینئر اسٹنٹ پروفیسر، شعبہ اردو، جموں یونیورسٹی

Dr. Abdul Rasheed Manhas Sr.Assistant Prof. Dept. of

Urdu Jammu University

مدیر

Jawed Anwar جاوید انور

cell : 0091-9935957330

"Urdu Ki Chand Ghair Muslim Shairaat ki Sheri Khidmaat" By:
 Dr. Muhd. Raghیب Muhd. Talیب Deshmukh (H.O.D. Dept. of Urdu
 G.S. Science, Arts and Commerce College Kham Gaon Buldana
 ڈاکٹر محمد راغب محمد طالب دیپٹلمنٹ (ایسوسی ایٹ پروفیسر، صدر شعبہ اردو، جی ایس سائنس، آرٹس اینڈ کامرس،
 کالج کھام گاؤں ضلع بلڈانہ، مہاراشٹر)

اردو کی چند غیر مسلم شاعرات کی شعری خدمات

ہر ملک کی خواتین نے جہاں تمدن، معاشرت اور سیاست میں کم و بیش حصہ لیا ہے وہاں زبان و ادب، اور شعر و شاعری کی ترقی میں بھی انھیں ایک حد تک شریک پایا جاتا ہے۔ یورپ ہو یا ایشیا، چین ہو یا جاپان، ایران ہو یا ہندوستان، ہر ملک میں وہاں کے ماحول اور تمدن کے مطابق ایسی خواتین پیدا ہوتی رہی ہیں جو ادبیات کے گلستاں کو سدا بہار بنانے میں ساعی ہوئیں۔ یوں بھی عورت میں فنون لطیفہ سے لذت گیر ہونے کے جذبات مرد سے کچھ زیادہ ہی ہوتے ہیں۔ یہ اور بات ہے کہ معاشرت اور ماحول اسے اپنے جذبات کے اظہار کا موقع نہ دے۔ مصوری، موسیقی، شاعری کیلئے جن لطیف احساسات اور نازک جذبات کی ضرورت ہوتی ہے۔ وہ عورت میں بدرجہ اتم موجود ہوتے ہیں۔ مگر ہندوستانی ماحول نے خواتین کے ان احساسات و جذبات کو بہت کم اُبھرنے اور ظاہر ہونے کا موقعہ دیا ہے۔ خواتین کی جانب سے اس تغافل کا ہی نتیجہ ہے کہ شاعرات سلف کے حالات اور کلام سے ہم بالکل تاریکی میں ہیں۔ آج ان کے احوال و کلام کی تدوین کی کوشش، ظلمات میں آب حیات کی تلاش سے کسی طرح کم نہیں ہے۔ اس دور میں معاشرت کی ایک گونہ تبدیلی اور نشر و اشاعت کی سہولت کے باعث، ہم کو کچھ ادیب اور شاعر خواتین کے نام نمایاں نظر آنے لگے ہیں۔

دنیا کی مختلف کارکردگیوں کی طرح ادب کی تخلیق و ترویج اور ترقی میں مردوں کے ساتھ ساتھ خواتین بھی برابر کی شریک رہی ہیں۔ ملکہ اور غیر ملکی، قدیم و جدید زبانوں کے ادبیات کے مطالعہ سے تحقیق و تنقید سے یہ بات عیاں ہو جاتی ہے کہ مردوں کے ساتھ ساتھ عورتوں نے بھی ادب کی مختلف اصناف سخن نثر و نظم میں داد سخن حاصل کی ہے۔ اردو میں خواتین کی شاعری کے ابتدائی نمونے عہد احمد شاہی میں ملتے ہیں۔ اردو میں خواتین کی شاعری کو فروغ بیسویں صدی میں حاصل ہوا، تعلیم کے پھیلاؤ، عورتوں کے رسائل

۸۔ دپتی مشرا: اتر پردیش کے ایک چھوٹے سے قصبے نما شہر لکھیم پور کھیری میں دپتی مشرا کا جنم ۱۵ نومبر ۱۹۵۹ء کو ہوا۔ دپتی مشرا کی ہائی اسکول کی تعلیم گورکھپور میں ہوئی۔ بنارس ہندو یونیورسٹی سے بی اے اور میرٹھ یونیورسٹی سے ایم اے مکمل کیا۔ دپتی مشرا کی اب تک تین کتابیں شائع ہو چکی ہیں۔ ان کی شاعری میں بے باکی، سچائی اور صاف گوئی مصری کی ڈلی کی طرح گھلی ہوئی رہتی ہے۔

دکھتی رنگ پرانگی رکھ کر پوچھ رہے ہو کیسے ہو تم سے یہ امید نہیں تھی، دنیا چاہے جیسی ہو

دپتی مشرا ایک اچھی اداکارہ بھی ہیں۔ ان کے اس شوق نے انہیں ۲۰۰۱ء میں ممبئی لے آیا۔

سچ کو میں نے سچ کہا، جب کہہ دیا تو کہہ دیا اب زمانے کی نظر میں یہ حماقت ہے تو ہے

۹۔ اوشا بھدوریہ: بھوپال کی رہنے والی شاعرہ ہیں۔ ان کا کلام مختلف رسائل میں شائع ہوا ہے۔ ان کی غزلیں نرم و نازک و لطیف جذبات کو مترنم انداز میں دلوں پر اثر انداز ہوتی ہیں۔ نمونہ کلام۔

رنگوں کو خوشبو پہناتے جب بھی مجھ کو پاس بلائے

۱۰۔ پریتا بھاپانی: اردو کی نوجیز شاعرہ ہیں وہ پہلے لکھنؤ میں بعد میں الہ آباد میں مقیم ہوئیں۔ ان کی غزلیات ماہ نامہ شاعر میں شائع ہوئی ہیں۔ جوسر ملی شیشی، رواں زبان اور بے انتہائی خیالات کا آئینہ ہیں۔

بے سبب میں بھی زمانے سے پریشاں ہوں بہت بے سبب مجھ سے پریشاں ہیں زمانے والے

۱۱۔ چاندرنانی: منشی لکشمی نرائن جوہری کے یہاں بریلی میں تولد ہوئیں۔ انہیں بچپن سے ہی ادب و شاعری سے لگاؤ رہا ہے۔ ان کے مضامین اردو کے مقتدر رسائل میں شائع ہوتے رہے۔

مٹھی باندھے جہاں میں آتا ہے بشر ظاہر ہے وہاں سے کچھ لاتا ہے بشر

۱۲۔ اندر شبنم اندو: شبنم پونا شہر کی مشہور و معروف شاعرہ اور ادیبہ ہیں۔ ان کی کل ۲۱ مطبوعات شائع ہو چکی ہیں۔ جن میں غزلوں، نظموں اور کہانیوں کا شمار بھی ہے۔

میں سچ بولوں تب بھی جھوٹی بنتی ہوں اس کو لیکن خوب مکرنا آتا ہے

۱۳۔ ڈاکٹر ریکھا روشنی: ریکھا روشنی کا پورا نام ریکھا کنگر روشنی ہے جو گھٹا کو پر مہمی میں مقیم ہے۔ روشنی اردو کے علاوہ گجراتی، ہندی، اور انگریزی زبان میں بھی شاعری کرتی ہیں۔ ان کا کلام ملک کے مختلف رسائل کی زینت بن چکا ہے۔

تیرے بغیر جشن بہاراں کو کیا کروں جھونکا ادھر نہ آئے نیم بہاراں کا

۱۴۔ مایا کھنہ راجے: جناب نہال سنگھ کی دختر ہیں۔ آبائی وطن بریلی ہے۔ شاعری کا بے حد شوق ہے۔ آواز مترنم پائی ہے۔ ان کا کلام رسائل میں شائع اور ریڈیو پر بھی نشر ہوتا ہے۔ ان کے اب تک تین شعری مجموعے

نے اس میں اہم رول ادا کیا۔ ۲۰ ویں صدی کے نصف اول میں اور آزادی کے بعد بے شمار شاعرات اردو میں عروج سخن کے گیسو سوار نے میں مصروف نظر آتی ہیں۔ جن میں مسلم خواتین کے ساتھ ساتھ غیر مسلم خواتین بھی شامل ہیں۔ ان میں درج ذیل غیر مسلم شاعرات شامل ہیں۔

۱۔ نوبیلا سنگھا: شہری متی نوبیلا سنگھا آزادی سے قبل کے زمانے کی ایک خوش فکر شاعرہ تھیں۔ ان کا کلام جذباتی اعتبار سے بہت صاف اور بلند اور پر کیف ہوتا تھا۔ نمونہ کلام:

کیا سناؤ کوئی فسانہ دل جس کا انجام ہے نہ ہے آغاز

۲۔ آشا پریمات: سنا سنا جی بہار کی جدید خوش گو خوش فکر شاعرہ ہیں۔ ان کا کلام ملک کے مختلف رسائل میں شائع ہوتا رہا ہے۔ وہ تقسیم، غزلیں لکھتی ہیں۔ نمونہ کلام

ان کی باتوں کا سلسلہ ان کی باتوں کا

۳۔ انامیکا شہانی: بیمنی کی رہنے والی اردو کی خوش گو، غزل گو شاعرہ ہیں۔ نمونہ کلام

دوسروں کو چھاؤں دیتا اور خود چلتا ہوا تپتے موسم میں محبت کا شہرا چھا لگا

۴۔ ارچنا مشرا: ارچنا چلی بھیت میں پیدا ہوئیں۔ ارچنا کا کلام مترنم اور ظاہری معنوی کئی خوبیوں خصوصیات سے آراستہ ہے۔

یاد آتی بنتی کی ان کو کیوں نہ آتی ہے ظالموں نے جب مل کر اک کلی جلائی ہے

۵۔ اوشا شفق: دور حاضر کی مشہور شاعرہ ہیں۔ ان کا مجموعہ کلام ”آہٹ“ کے عنوان سے منظر عام پر آیا ہے۔ اوشا کے کلام میں فکر اور جذبے کی آمیزش نہایت حسین و جمیل ہے۔ نسوانی مزاج کی جھلک ہے، نسوانی انداز و

تربیان، سوز و گداز، غم عشق اور غم روزگار کی جانب اشارے ملتے ہیں۔

بے دست و پائیں دائرہ ہست و بود میں گھبرا گئے ہیں زندگی جاوداں سے ہم

۶۔ سونیتا تریپاٹھی: سونیتا تریپاٹھی الہ آباد ہائی کورٹ کی ایڈووکیٹ ہیں۔ انہیں وکالت کے ساتھ ساتھ اردو شاعری و ادب سے بھی بے حد لگاؤ ہے۔ انکی شاعری کا مجموعہ ”آرزو کی تتلیاں“ زیر طبع ہے۔

لاج ان کا پتے ہونوں کی خدا را رکھ لو ہو کے مجبور بہت میں نے زباں کھولی ہے

۷۔ سونیتا ایم: سونیتا ایم دہلی کی ایک ممتاز شاعرہ ہی نہیں بلکہ وہ ایک ادیب، مدیر، تبصرہ نگار، اور نقاد بھی ہے۔ ان کی پیدائش دہلی میں ہوئی۔ ان کا کلام اور چٹا میں کئی مشاعروں، کوی سلیکٹوں، ریڈیو، اور ٹی وی کی

زینت بن چکی ہیں۔ ان کے کلام کا نمونہ پیش ہے۔

اس کے نام پر میں بھی جان و دل بنا دیتی کاش کوئی انہوں میں اتنا معتبر ہوتا

منظر عام پر آچکے ہیں۔ دو ایک خوش فکر، خوش گو قادر الکلام شاعرہ ہیں جس کی نظر زندگی اور اسکے مختلف پہلوؤں اور موضوعات پر گہری ہے۔ ان کی شاعری گل و بلبل کی فرضی داستان نہیں بلکہ زندگی کی عکاسی ہے۔

برایک گام ملے ہیں جو اہرات کے ڈھیر مگر خلوص کی دولت نظر نہیں آتی

۱۵۔ راج کمار سورج کا سہائے سرور: دور حاضر کی مشہور و مقبول صاحب دیوان شاعر نرائن بسریا کی صاحب زادی ہیں۔ انہوں نے ایسے خاندان میں پرورش پائی جو اردو زبان کا شیدائی تھا۔ مدھیہ پردیش اسپتلی کی مہربھی روچھی ہیں۔ آپ کا شعری مجموعہ ”حرم ناز“ شائع ہوا۔

ہوئی کب شیخ کو فرصت غرور خود پسندی سے اسے اس کی بلا جانے کہ پروانوں پہ کیا گذری

۱۶۔ روپا صاحبہ: چنڈی گڑھ پنجاب کی رہنے والی شاعرہ ہیں۔ ان کی شاعری، غزل کے لغوی معنی کے اعتبار سے عورتوں کی زبان میں عورت کے جذبات کی عکاسی ہے۔ ان کی کئی غزلوں کا لہجہ تانیسی ہے۔

ووصبا حال پوچھتا ہی نہیں جو ذرا بولوں گی تو رولوں گی

۱۷۔ کسم پرائر: بھوپال کی رہنے والی شاعرہ ہیں۔ کلام ہندی آمیز ہے۔ نمونہ کلام۔

کبھی دگر تھی گھن نہیں پاتی آتما دیہہ بن نہیں پاتی

ان شاعرات کی شاعری کو پڑھنے ان کا تجزیہ کرنے کے بعد یہ احساس ہوتا ہے کہ صنف نازک کے جذبات چاہے وہ کسی بھی مذہب علاقے فرقت سے تعلق رکھتی ہو وہی نسوانی خوشبو، دھتک رنگ کے رنگ میں ڈوبے نظر آتے ہیں۔ دور حاضر کی اردو شاعری کی محضبانہ فضا میں اس امر کو بھی واضح کرتے ہے کہ اردو صرف مسلمانوں کی ہی نہیں بلکہ غیر مسلموں کی زبان بھی ہے اور ہر قسم کے جذبات انسانی کو بیان کیا ہے۔ مذہب، اخلاق، سماجی مسائل، معاشرت، معیشت، عشق و محبت، انسانیت کبھی پہلوئے حیات پر ان کی نظر گئی ہے۔ بیشتر خواتین نے تانیسی صیغے استعمال کئے ہیں اور نسوانی جذبات و خیالات و خواہشات اور معاشرت کی تصویر کشی کی ہے۔ اس لئے اسے تانیسی شاعری کہنا زیادہ مناسب ہے۔ یہ شاعری، خالص عورتوں کی شاعری ہے۔ عورت کے جذبات و خیالات کو نسوانی زبان، الفاظ، تراکیب، محاورے و مثال، صنائع، بدائع، موضوعات استعمال کر کے مندر بنادیا ہے۔ اس میں لسانی، ادبی، سماجی، تانیسی عناصر محفوظ ہو گئے ہیں۔ جو بہت بڑی ادبی خدمات و اہمیت رکھتے ہیں۔

حوالہ جاتی کتب:-

۱۔ غیر مسلم اردو شعراء کی شعری خدمات، ڈاکٹر ایم اظہر حیات، یثودا گرلز آرٹس اینڈ کامرس کالج، ناگپور، ۲۰۱۱ء ص ۷۶، ۸۵

شمارہ 53، جولائی تا ستمبر 2021، July to sep 2021

۲۔ غیر مسلم اردو شعراء کی شعری خدمات، ڈاکٹر ایم اظہر حیات، یثودا گرلز آرٹس اینڈ کامرس کالج، ناگپور، ۲۰۱۱ء ص ۹۰، ۹۳

۳۔ جدید اردو شاعرات اردو فنی فکر اور نئے راستے، ڈاکٹر طاہرہ پروین، انجمن تہذیب و ثقافت، شہرہ آلود، ۲۰۰۵ء

۴۔ تذکرہ شاعرات روہیل کھنڈ، شاداب ذکی بدایونی، بریلی الیکٹرونک پریس بریلی، ۱۹۹۱ء

۵۔ تذکرہ شاعرات لکھنؤ جلد اول، ہمدینہ فاروقی، فخر الدین علی احمد میموریل کمیٹی لکھنؤ، ۲۰۰۹ء

۶۔ آزادی کے بعد اردو شاعرات، نجمہ رحمانی، بھارت آفسیٹ پریس دہلی، ۱۹۹۳ء

۷۔ ماہنامہ آجکل نئی دہلی، مختلف شمارے

۸۔ ماہنامہ شاعر مئی، مختلف شمارے

۹۔ ماہنامہ اردو دنیا نئی دہلی، مختلف شمارے

☆☆☆☆



UGC Care Listed

شماره ۵ (پریل تا جون ۲۰۲۲ء)

تحریک ادب

ISSN: 2322-0341

A Peer Reviewed,
Referred Literary And Research Journal

website: www.tahreekeadab.com

e-mail: tahreekeadab2008@gmail.com

e-mail: jaweanwar@gmail.com

Cell: +91-9935957330



مدیر

جاوید انور



بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

تحریک ادب

اپریل تا جون 2022 جلد نمبر 15

Tahreek-e-adab vol-15,issue-57 April-June 2022

مجلس ادارت

Editorial board and Peer Review committee

پروفیسر صغیر افراہیم، سابق صدر شعبہ اردو، علی گڑھ مسلم یونیورسٹی

Prof. Sagheer Afrahim Ex.Chairman Dept.of Urdu A.M.U.

پروفیسر شہاب عنایت ملک، شعبہ اردو، جموں یونیورسٹی

Prof. Shohab Inayat Malik, Ex. H.O.D.Dept of Urdu

University of Jammu

ڈاکٹر شمس کمال انجم، صدر شعبہ عربی، بابا غلام شاہ بادشاہ یونیورسٹی

Dr. Shams Kamal Anjum, H.O.D. Dept.of Arabic, Baba

Ghulam Shah Badshah University

ڈاکٹر عبدالرشید منہاس، سینئر اسٹنٹ پروفیسر، شعبہ اردو، جموں یونیورسٹی

Dr. Abdul Rasheed Manhas Sr.Assistant Prof. Dept. of

Urdu Jammu University

مدیر Editor

جاوید انور Jawed Anwar

cell : 0091-9935957330

Mirza Daag Dehlvi: Shakhshiyat aur Fan by: Dr. Raghieb Deshmukh
(HOD Urdu, G.S. Science, Arts & Commerce College, Khamgaon,
Buldana) cell-7972780976, 9422926544

ڈاکٹر محمد راغب محمد طالب دیشمکھ (بلڈانہ)

مرزا داغ دہلوی: شخصیت اور شاعری

داغ دہلوی کا نام نواب مرزا خاں مشہور ہے جو کہ ابو مظفر بہادر شاہ بادشاہ کا دیا ہوا ہے۔ داغ ۲۱ رزی الحجہ ۱۲۴۶ھ بمطابق ۲۵ مئی ۱۸۱۳ کو دہلی میں پیدا ہوئے۔ والد کا نام نواب شمس الدین خاں، دادا کا نام احمد حسین خاں جو لوہارو کے ایک رئیس تھے۔ اُنکے والد کو ولیم فیئر کے قتل کے الزام میں سزائے موت دی گئی۔ اُس وقت داغ کی عمر ۳ برس کی تھی۔ آپ کی والدہ نے بہادر شاہ ظفر کے بیٹے مرزا فخر و سے شادی کر لی۔ اس طرح داغ قلعہ معلیٰ میں باریاب ہوئے ان کی پرورش وہیں ہوئی۔ بہادر شاہ ظفر اور مرزا فخر و دونوں ذوق کے شاگرد تھے۔ لہذا داغ کو بھی ذوق سے فیض حاصل کرنے کا موقع ملا۔ داغ کی زبان بنانے اور سنوارنے میں ذوق کا یقینا بہت بڑا حصہ ہے۔ غدر کے بعد رام پور پہنچے جہاں نواب کلب علی خان نے داغ کی قدر دانی فرمائی اور باقاعدہ ملازمت دے کر اپنی مصاحبت میں رکھا۔ داغ چوبیس سال تک رام پور میں قیام پزیر رہے۔ اس عرصے میں انہوں نے بڑے آرام و سکون اور عیش و عشرت میں وقت گزارا یہیں انہیں ”حجاب“ سے محبت ہوئی اور اس کے عشق میں کلکتہ بھی گئے۔ مثنوی فریادِ عشق اس واقعہ عشق کی تفصیل ہے۔ نواب کلب علی خان کی وفات کے بعد حیدرآباد دکن کا رخ کیا۔ نظام دکن کی استادی کا شرف حاصل ہوا۔ دبیر الدولہ، فصیح الملک، نواب ناظم جنگ بہادر کے خطاب ملے۔ ۱۹۰۵ء میں فالج کی وجہ سے حیدرآباد میں وفات پائی۔ داغ کو جتنے شاگرد میسر آئے اتنے کسی بھی شاعر کو نہ مل سکے۔ اس کے شاگردوں کا سلسلہ ہندوستان میں پھیلا ہوا تھا۔ اقبال، جگر مراد آبادی، سیماب اکبر آبادی اور احسن مارہروی جیسے معروف شاعروں کو ان کی شاگردی کا شرف حاصل ہوا۔ ان کے جانشین نوح ناروی بھی ایک معروف شاعر ہیں۔

اردو شاعری میں زبان اور اس کی مزاج شناسی کی روایت کا آغاز سودا سے ہوتا ہے۔ یہ

روایت ذوق کے توسط سے داغ تک پہنچی داغ نے اس روایت کو اتنا آگے بڑھایا کہ انہیں اپنے استاد ذوق اور پیش رو سودا دونوں پر فوقیت حاصل ہو گئی۔ اس کی وجہ یہ ہے کہ جب داغ نے ہوش سنبھالا تو لال قلعے میں بہادر شاہ ظفر، استاد ذوق اور ان کے شاگرد زبان کو خراپر چڑھا کر اس کے حسن کو نکھار رہے تھے۔ اور بہادر شاہ ظفر کے ہاتھوں اردو کو پہلی بار وہ اردو پن نصیب ہو رہا تھا۔ جسے بعد میں داغ کے ہاتھوں انتہائی عروج حاصل ہوا۔ داغ کے زمانے میں زبان کی دو سطیں تھیں ایک علمی اردو دوسری عوامی غالب علمی زبان کے نمائندے تھے۔ اور ان کی شاعری خواص تک محدود تھی۔ اس کے برعکس داغ کی شاعری عوامی تھی وہ عوام سے گفتگو کرتے تھے۔ لیکن ان کے اشعار خواص بھی پسند کرتے تھے۔ کیونکہ ان کے اشعار معاملات عشق کے تھے اور ان موضوعات میں عوام و خواص دونوں کی دلچسپی زیادہ ہوتی ہے۔ بقول عطا "محبت کی گھاتیں اور حسن و عشق کی ادا میں داغ کے کلام کا طرہ امتیاز ہیں دو عملی عاشق تھا اس کے اشعار اس کی عشقیہ وارداتوں کی ڈائری کے رنگین اور مصور اوراق ہیں۔"

داغ سچ پوچھے تو زبان کے شاعر ہیں۔ زبان کا جتنا فن کارانہ ہنرمندانہ بر محل اور موزوں استعمال داغ نے کیا ہے وہ کسی اور شاعر کے کلام میں نظر نہیں آتا۔ وہ دبستان دہلی کے آخری نمائند شاعر تھے۔ انھوں نے راجپور و حیدرآباد وغیرہ میں بھی اپنی زندگی کا قابل لحاظ حصہ گزارا لیکن انھیں ان میں قلعے میں گزارا ہوئی زندگی کا ان کی شاعری پر گہرا نقش ہے۔ قلعہ معلیٰ کی اردوان کے مزاج، ان کی فطرت میں رچ بس گئی تھی۔ کوثر و تسنیم میں دہلی زبان ضرب الامثال، روزمرہ، محاورے، شہتہ و شائستہ لہجہ، داغ کے علاوہ اور کسی کے پاس نہیں ملتا۔ اس کی داد اور تواتر اور غالب نے بھی دی ہے۔ نثار علی شہرت نے "آئینہ داغ" میں لکھا ہے کہ غالب نے کہا: ذوق نے اردو کو اپنی گود میں پالا تھا داغ اس کو نہ فقط پال رہا ہے۔ بلکہ اس کو تعلیم دے رہا ہے۔ داغ اس میں کوئی شبہ نہیں قلعہ معلیٰ کی اردو، وہاں کے محاورات اور روزمرہ کی افادیت سے بخوبی واقف تھے اور ان کی شاعری کا مشن تھا کہ یہ زبان اور محاورات وغیرہ ملک گیر سطح پر عام ہوں۔ ہر چند کہ رام پور پھر حیدرآباد میں قیام کی وجہ سے ان کے لہجے میں کہیں کہیں تبدیلی کا احساس ہوتا ہے لیکن مجموعی طور پر وہ اپنے مقصد میں کامیاب رہے۔ انھوں نے اس طرح اپنی غزل سے وہ کام لیا جو کسی دبستان سے ممکن تھا۔ داغ زبان کے بارے میں خاص احتیاط سے کام لیتے تھے۔ وہ دہلی کی زبان کو مستند خیال کرتے تھے لیکن اتنی وسیع النظری بھی تھی کہ لکھنؤ کی زبان کو مسترد نہیں کرتے تھے ہاں اس کو قابل تقلید متصور نہیں کرتے تھے۔ داغ کے پاس کوئی فکر و فلسفہ نہیں تھا اور یہ بھی کہ جذبات و احساسات کے اظہار میں گہرائی نظر نہیں آتی۔ محبوب کے

انداز و ادا اور عشق و محبت کے مختلف پہلوؤں کو انھوں نے نہایت دلکشی کے ساتھ پیش کیا جس میں زبان و بیان کا لطف شامل ہے اور پھر یہ کہ آزاد اور حالی نے نظم نگاری کو فروغ دیا جس کی وجہ سے غزل پس پشت پڑ گئی تھی۔ داغ نے اپنے طور پر سنبھالا دیا۔ آج اردو غزل میں جو بائکین اور طرح داری و وزن و وقار ہے اس میں داغ کا حصہ قابل لحاظ ہے۔

داغ غزل کے شاعر ہیں، روایتی غزل کے۔ ان کی غزل گوئی کا رشتہ ساخت اور بافت دونوں اعتبارات سے متقدمین اور متوسطین کی غزل گوئی سے ملتا ہے۔ اپنے اسی روایتی انداز کے باعث وہ صف اول کے غزل گو شاعروں میں شمار نہیں کیے جاتے۔ پھر بھی اردو غزل میں داغ کی اہمیت ہے۔ ان کو اردو غزل میں انفرادی اور امتیازی مقام حاصل ہے۔ داغ کی غزل کے تصور بڑے بانگے ہیں۔ ان کی غزل اردو غزل کی روایت سے ہم آہنگ ہوتے ہوئے بھی کچھ نئے پن کی حامل نظر آتی ہے اور یہ ان کے مخصوص مزاج کی دین ہے۔ داغ کے مزاج اور ان کے لہجے نے اردو شاعری کے روایتی اور گھسے پٹے موضوعات کو نیا رنگ و آہنگ دیا۔ معشوق سے داغ کا رویہ، رقیب سے برتاؤ اور زاہد و ناصح سے مراسم، ان سب میں داغ نے اپنی آن بان کو برقرار رکھا ہے۔ ان کی مقبولیت کا ایک سبب ان کے لہجے کی طرح داری اور ٹیکھا پن ہے۔ یہ اشعار ملاحظہ ہوں:

آپ کے سر کی قسم، داغ کو پروا بھی نہیں
آپ کے ملنے کا ہوگا جسے ارماں ہوگا
جواب اس طرف سے بھی فی الفور ہوگا
دبے آپ سے وہ کوئی اور ہوگا
تم کہتے ہو معشوق اطاعت نہیں کرتے
عاشق بھی تو معشوق کا نوکر نہیں ہوتا
کیا سمجھتے ہو تم اپنے آپ کو
خوب رویوں سے جہاں خالی نہیں

داغ کا کلام اردو شاعری کی اس عظیم رویت کی توسیع اور تسلسل پر مبنی ہے جس میں حسن و عشق کو بنیادی اہمیت حاصل ہے۔ داغ کے انداز بیان میں اجتماعیت کے ساتھ جو شیرینی، شکفتگی اور حلاوت ہے وہ بطور خاص ان کی طبیعت کا رنگ ہے۔ وہ احساس جمال کے ساتھ ساتھ وسیع تجربہ بھی رکھتے ہیں۔ ان کے تاثرات ایک حسین پیکر میں ڈھل جاتے ہیں۔ ان کی زبان میں سلاست و سادگی اور حسن و عشق کے جذبات کی ترجمانی ملتی ہے۔ داغ کی زندگی میں بے ساختہ پن، حاضر جوابی اور آداب و لحاظ کا احساس شدت کی حد تک موجود تھا۔ ان کی شاعری میں تکلف نہیں ملتا، انھوں نے اپنے پیرائے بیان کو آسان انداز میں بھی پیش کیا ہے۔ داغ زبان کے بادشاہ ہیں جس کے ذریعہ انھوں نے نازک سے نازک مسائل اور حسن و عشق کے معاملات اور سادگی کو جو چمکا رہا ہے وہ اردو زبان و

غزل کی تاریخ کا سنہرے باب ہے۔

ہم ساتھ ہو لیے تو کہا اس نے غیر سے
جلوے کے بعد وصل کی خواہش ضرور تھی
کہہ چکے غیر تو افسانے سب اپنے اپنے
سادگی، باکپن، اغماض، شرارت، شوخی
آتا ہے کون اسی سے کہو یہ جدا چلے
وہ کیا رہا جو عاشق دیدار ہی رہا
مجھ کو کیا حکم ہے سرکار کہوں یا نہ کہوں
تو نیا نیا زوہ پائے ہیں کہ جی جانتا ہے

نواب مرزا خاں داغ کی زندگی جاگیر دارانہ اور شاہانہ روایات کے دور کی زندگی تھی جس میں اس عہد کی بیشتر خصوصیات نمایاں ہیں۔ دہلی کی شاعری غالب و ذوق کے بعد داغ سے زندہ تھی انھوں نے مروجہ روایتوں سے اختلاف کر کے اپنی ایک الگ طرز نکالی۔ داغ کی شاعری میں ابتدا تا آخر ایک ہی رنگ ہے۔ ان کا شروع سے آخر تک زندگی کے متعلق ایک ہی نظریہ رہا اور وہ یہ تھا کہ زندگی ایک آرزوئے مسلسل اور شوق نام تمام کا نام ہے جس میں لذت کے ساتھ ساتھ عیش اور تنوع ہے مگر ہزیمت خوردگی نہیں ہے۔ داغ دہلوی نے تقریباً تمام اصناف سخن پر طبع آزمائی کی لیکن ان کی شہرت کا انحصار ان کی غزلوں پر ہے۔ ان کا کلام بالخصوص تاریخی اور ادبی اہمیت کا حامل ہے۔ اردو شعرا نے شاعری کا فن اور زبان و بیان کے رموز و نکات داغ سے سیکھے ہیں اور اردو کی ترویج و اشاعت میں ان کے شاگردوں نے نمایاں کارنامہ انجام دیا ہے۔ وہ ایک مسلم الثبوت استاد اور اردو کے مشہور و معروف شاعر تھے۔ اردو ادب کی تاریخ میں داغ دہلوی کا نام ہمیشہ زندہ و تابندہ رہے گا۔

کتابیات و ماخذ:- 1۔ مطالعہ داغ، ڈاکٹر سید محمد علی زیدی، نظامی پریس، لکھنؤ

2۔ داغ دہلوی کی سوانح حیات، نور اللہ مخدومی، اعظم اسٹیم پریس، چارمینار، حیدرآباد۔

3۔ گلزار داغ، نواب مرزا خاں، داغ دہلوی، محمد تیغ بہادر، لکھنؤ۔

4۔ داغ دہلوی، شاہد ماہلی، غالب انسٹی ٹیوٹ، نئی دہلی، 1002

5۔ داغ دہلوی حیات اور کارنامے، ڈاکٹر کامل قریشی، اردو اکادمی دہلی، 3002

6۔ داغ دہلوی، مخمور سعیدی، ساہتی اکادمی، نئی دہلی، 4002

7۔ یادگار داغ، منشی محمد اکبر علی خاں افسوس،

8۔ داغ، تمکین کاظمی، 9۔ جلوہ داغ، احسن ماہروی، 10۔ بزم داغ، سید رفیق مارہروی،

11۔ آئینہ داغ، محمد ثار علی شہرت، طبع اول 12۔ سہ ماہی داغ دہلوی، نئی دہلی، داغ اکیڈمی، نئی دہلی ستمبر





UGC Care Listed
(www.ugc.ac.in)

تہریق ادب

ISSN 2322-0341

A Peer Reviewed,
Referred Literary And Research Journal

website: www.tahreekeadab.com
e-mail: tahreekeadab2008@gmail.com
e-mail: jaweanwar@gmail.com
Cell: +91-9935957330

مدیر

جاوید انور



بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

تحریک ادب

اپریل تا جون 2022 جلد نمبر 15

Tahreek-e-adab vol-15,issue-57 April-June 2022

مجلس ادارت

Editorial board and Peer Review committee

پروفیسر صغیر افراہیم، سابق صدر شعبہ اردو، علی گڑھ مسلم یونیورسٹی

Prof. Sagheer Afrahim Ex.Chairman Dept.of Urdu A.M.U.

پروفیسر شہاب عنایت ملک، شعبہ اردو، جموں یونیورسٹی

Prof. Shohab Inayat Malik, Ex. H.O.D.Dept of Urdu

University of Jammu

ڈاکٹر شمس کمال انجم، صدر شعبہ عربی، بابا غلام شاہ بادشاہ یونیورسٹی

Dr. Shams Kamal Anjum, H.O.D. Dept.of Arabic, Baba

Ghulam Shah Badshah University

ڈاکٹر عبدالرشید منہاس، سینئر اسٹنٹ پروفیسر، شعبہ اردو، جموں یونیورسٹی

Dr. Abdul Rasheed Manhas Sr.Assistant Prof. Dept. of

Urdu Jammu University

مدیر Editor

جاوید انور Jawed Anwar

cell : 0091-9935957330

by: Dr. Mohd. Raghib Deshmukh (HOD Urdu, G.S. Science, Arts &
Commerce College, Khamgaon, Buldana) cell-7972780976

ڈاکٹر محمد راغب محمد طالب دیپشکھ

(صدر شعبہ اردو، جی ایس سائنس، آرٹس اینڈ کامرس کالج، کھام گاؤں ضلع بلڈانا)

ودر بھ میں اردو شاعری اور چند قدیم مشہور شعراء

علاقہ ودر بھ میں اردو زبان و ادب کا آغاز دکن کے ساتھ ہوا۔ جیسے جیسے دکن میں اردو زبان و ادب کا عروج ہوا ودر بھ پر بھی اس کے اثرات پڑے کہ ودر بھ دکن ہی کا ایک حصہ تھا اور اسی سے پیوستہ تھا۔ دکن میں بیرونی فاتحین کے قدم ۶۹۳ھ مطابق ۱۲۹۳ء سے پڑنے شروع ہوئے۔ دکن پر علاؤ الدین خلجی اور محمد تغلق کے تبدیلی دار السلطنت کی تاریخوں ہی سے دکن کی زبان میں لسانی تبدیلیاں آنی شروع ہوئیں اور اہل دکن پر بیرونی زبانوں اور تہذیبوں کے اثرات پڑنے شروع ہوئے۔ زبان میں نئے نئے الفاظ کا اضافہ ہونے لگا۔ اس وقت دکن میں فارسی کو سرکاری زبان کا درجہ حاصل تھا اور عوامی زبان تیلگو اور مراٹھی تھی۔ فارسی زبان جب علاقائی زبانوں سے متاثر ہوئی تو ایک نئی زبان دکنی کی بنیاد پڑی۔ دکن دکن میں اردو زبان و ادب حضرت خواجہ بندہ نواز گیسو دراز کے دور سے باقاعدہ رواج پا چکے تھے۔ اور اس کے اثرات علاقہ ودر بھ پر بھی دکن کے ساتھ ساتھ ہی مرتکز ہوئے تھے۔ بہمنی سلطنت کے بعد حکومت پانچ مختلف حصوں میں منقسم ہوئی تو برار (ودر بھ) پر عماد شاہی حکومت کا پرچم لہرایا۔ عماد شاہی اور اس کے بعد کے دور میں صحیح معنوں میں اردو نے ودر بھ میں اپنا ایک مقام بنایا اور ترقی کی منزلیں طے کیں خصوصاً عماد شاہی دور اردو کے فروغ اور ترقی میں خصوصی اہمیت کا حامل ہے ورنہ اس سے قبل یہاں کی زبان اور شاعری پر فارسی الفاظ کا غلبہ تھا اور زیادہ تر شاعری بھی فارسی ہی میں ہوا کرتی تھی۔ شعراء اسی زبان میں طبع آزمائی کرتے تھے۔ دکنی الفاظ کا استعمال کلام میں بہت کم ہوا کرتا تھا گو کہ دکنی اردو کی ساخت بن چکی تھی اور اس میں خیالات کا اظہار بھی کیا جانے لگا تھا۔ لیکن شعری طور پر اسے وہ مقام نہیں ملا تھا جس کی وہ مستحق تھی۔ لیکن بہمنی دور اور عماد شاہی دور کے بعد اس زبان کو اپنا مقام ملنا شروع ہوا۔

دکنی دور میں علاقہ ودر بھ کی اردو شاعری کا جائزہ لیتے ہوئے اردو کے پہلے شاعر کی

حیثیت سے میر لطف علی لطفی کو اولیت اور فوقیت دی جاتی رہی ہے۔ جو صحیح نہیں ہے تحقیق سے پتہ چلتا ہے کہ لطفی سے قبل اردو کے بلند پایہ شاعری کی حیثیت سے محمد مہر مہر اپنا نام و کلام چھوڑ گئے ہیں ادبی تاریخوں کے مطالعے سے محرم سے قبل کے بھی چند ایک شعراء کا ذکر ملتا ہے۔ مثلاً غلام مصطفیٰ خاں انسان، سید محمد درویش درسی، اور حضرت شاہ دولہا رحمن۔ لیکن اول تو یہ شعراء علاقہ و در بھ کے نہیں تھے بلکہ باہر سے آکر کچھ عرصے کے لئے یہاں رک گئے تھے اور پھر جلد ہی ودر بھ سے کوچ بھی کر گئے۔ دوئم یہ شعراء فارسی زبان میں شاعری کرتے تھے کی فارسی سے قریب تھے اگر ان شعراء نے اردو میں شعر کہے بھی ہیں تو تحقیقی نقطہ نظر سے اطمینان بخش طریقے پر کہیں دستیاب نہیں۔ اس طرح ودر بھ میں اردو شاعری کے آغاز و ارتقاء کو مد نظر رکھتے ہوئے محمد مہر مہر اردو کے پہلے شاعر قرار پاتے ہیں گو میر لطف علی لطفی سے کافی پہلے کے ہیں۔

(1) محمد مہر مہر۔ محرم کی پیدائش کے بارے میں حتمی طور پر کہیں کوئی ذکر نہیں ملتا اور نہ ہی، وثوق کے ساتھ پتہ چلتا ہے البتہ تمام تذکرہ نگار اس بات سے متفق ہیں کہ محرم کی وفات ۱۱۶۶ھ (۱۷۵۲ء) میں ہوئی اور یہ آصف جاہ ثانی کا دور تھا اس دور میں اردو نے دکن میں کافی ترقی حاصل کر لی تھی۔ محرم کے بارے میں نصیر الدین ہاشمی تحریر کرتے ہیں۔

”محرم شجاعت خاں صوبیدار کے فرزند تھے کچھی نرائن شفیق نے ان کے کلام کی بڑی تعریف کی ہے۔“ (دکن میں اردو، مولف نصیر الدین ہاشمی، ۳۱۳)

محرم فارسی کے ساتھ ساتھ اردو کے ایک اچھے اور سلجھے ہوئے شاعر تھے۔ صاف اور شستہ زبان میں شعر کہتے۔ نئے قلمبند کرتے انداز بیان بڑا موثر ہوا کرتا تھا۔ غزل کے اشعار میں نزاکت، محاورہ بندی اور معنی آفرینی ہوتی تھی۔

شاخ کی مینا کو کس شوخی سے لاتی ہے بہار گل پہ شبنم، نہیں ہے اس کو سے پلاتی ہے بہار
نزاکت، بسکہ رکھتا ہے وہ دلدار جہاں آراء صفائے آئینہ ہے باز اس کے عکس عالی کا
بجائے گا جو کوئی فرش راہ گھر خاں صوبے طے جیوں خار اس کو ہر گل نازک نہالی کا
بہار آدے تو بلبل کو نفس میں قید مت کرنا تو ایسا ظلم اس بیکس پہاے ڈھیلا دمت کچھو ۲۔
(چمنستان شعراء، مولف رائے کچھی نرائن اورنگ آبادی ۲۹۹، ۳۰۰)

(2) آقا محمد امین وفا علیچو ری:۔ ودر بھ میں اردو شاعری کے آغاز و ارتقاء کو مد نظر رکھتے ہوئے بلحاظ ادوار آقا محمد امین وفا علیچو ری کا نام نامی سامنے آتا ہے۔ وقفا اپنے وقت کے ایک سلجھے ہوئے ذہن

کے شاعر تھے۔ فارسی کے ساتھ ساتھ صحت مند اردو میں اچھے شعر کہتے تھے۔ آپ کے کلام میں دکنی لب و لہجہ زبان کا مزہ دے جاتا ہے۔ انداز بدلا ہوا اور ترقی یافتہ اردو سے قریب ہے۔ کلام میں مذہبی اور صوفیانہ خیالات زیادہ پائے جاتے ہیں اسی کے ساتھ ساتھ حسن و عشق اور رومانی اشعار بھی اپنی پوری گہرائی کے ساتھ نظر آتے ہیں جو زبان کا لطف دے جاتے ہیں۔ کلام میں سادگی، روانی، روزمرہ محاورے سلاست فکر و شعور کا احساس اور معیاری لب و لہجہ پایا جاتا ہے۔ وقفا کی مندرجہ ذیل غزل میں کلام کی روانی، شگفتگی اور تاثیر نمایاں طور پر نظر آتے ہیں۔

دو جہاں کو ترک کر اک دلربا کے واسطے اب خودی میں باز آے دل خدا کے واسطے
گھیرے حامد کے ہوں میں بند گھیرے میں پھنسا دل کی گھنڈی بن کے میں تیری قبا کے واسطے
(3) میر لطف علی خاں لطفی:۔ لطفی کا پورا نام میر لطف علی خاں ہے اور تخلص لطفی۔ لطفی نے بھی فارسی کے ساتھ ساتھ اردو زبان میں شاعری کی اور عشقیہ مثنوی بعنوان ’بہلول صادق‘ تصنیف کی۔ لطفی کا ودر بھ آصف جاہی دور ہے۔ ان کا انتقال ۱۲۰۰ھ کے آخر میں ہوا دیگر شعراء کی طرح لطفی کی پیدائش کے بارے میں صحیح پتہ نہیں چلتا البتہ تاریخ وفات تذکروں میں ایک سی ہے۔ بعض محققین نے میر لطفی علی خاں لطفی کو ودر بھ کا پہلا شاعر قرار دیا ہے لیکن تذکروں کے مطالعے اور تحقیق کی روشنی میں یہ بات غلط ثابت ہوئی ہے۔

سنا یک روز میں صاحب زباں میں جو اصل سخن تھا نیکو بیباں میں
فرشتہ خودی تھا پاکیزہ صورت جون باد صبح پس تیز حرکت

(4) شاہ غلام حسین:۔ شاہ غلام حسین کی تاریخ پیدائش ۱۱۳۳ھ اور وفات کی تاریخ ۱۲۱۰ھ ہے۔ شاہ غلام حسین ایک بلند پایہ شاعر تھے ان کا تمام کلام صوفیانہ رنگ میں رنگا ہوا ہے۔ غزلیات میں بھی یہی رنگ جھلکتا ہے۔ بچہتی اور آپسی اتحاد پر آپ نے بہت زور صرف کیا ہے۔ ہندو مسلمان دونوں آپ کے گردیدہ تھے۔ آپ اپنے وقت کے مشہور صوفی صادق تھے۔ اس وقت برابر میں انھیں کافی عزت حاصل تھی۔ ودر بھ میں اردو کی سمت ورفقار کو نیا موڈ دینے والوں میں شاہ غلام حسین اعلیٰ چوری کا نام سرفہرست آتا ہے۔

سکپے مال و دھن پر ہوتے کیوں دیوانے بچھے نہیں جیسے زندگانے
لگاؤ یہاں موے مومن و نیا جیسے مایے حسین کے بچپن کی رہیے کے نشانے
(5) میر شمس الدین فیض:۔ میر شمس الدین فیض ودر بھ کی شاعری پر سورج بن کر نمودار ہوئے۔ اگر

کسی نے دورِ بھ کی شاعری کو سب سے زیادہ متاثر کیا ہے تو وہ ہیں میرٹھس الدین فیض۔ شاہ غلام حسین کا اپنا ایک مخصوص صوفیانہ انداز تھا۔ اور فیض الگ طرز و طریق کے علم بردار تھے۔ فیض نے جہاں صوفیانہ و مذہبی شاعری کی وہیں غزل گوئی میں بھی ان کا ایک اونچا مقام ہے۔ انھوں نے دورِ بھ میں غزل کو ایک نئی سمت و رفتار دی۔ فیض سے قبل کے شعراء نے زیادہ تر مذہبی و صوفیانہ شاعری کی ہے۔ غزل بھی کبھی ہے لیکن اس میں کوئی خاص کمال حاصل نہیں کیا۔ اس کے برعکس فیض نے غزل میں مہارت اور استعداد حاصل کی اس کی کاکلوں کو سنوارا۔

پھر تباہوں بھٹکتا ہوا رہ نہیں ملتا ہے وہ گھر اس کا مجھے گھر نہیں ملتا
حرم میں دیر میں جب کوئی رو رو آیا مجھے یقیں ہوا بس یہی کہ تو آیا

(6) شاہ باقر حسین باقر: آصف جاہ ثانی کے دور میں برار کے صوبے دار صلابت خاں کے درباری شاعر کی حیثیت سے باقر کا نام بھی اہمیت کا حامل ہے۔

اے باقر تو سجدہ میں ہر دم رہا مرا حسین تو تجھ کو عیماں دیکھتے ہیں
کیا بخشش صلابت یہ یہ حیدر کا ہوا ہے صورت کو حسینی کے ہے آنکھوں میں جمایا

(7) نواب نامدار خاں جتئی مہدوی جرنیل: نواب نامدار خاں جتئی مہدوی ایلچپور کے آخری نوابوں میں سے تھے۔ فارسی کے ساتھ ساتھ اردو زبان پر بھی عبور حاصل تھا۔ دیوان جرنیل کے نام سے آپ کا ایک قلمی مجموعہ کلام آج بھی ایلچپور کے قاضی گھرانے کے پاس محفوظ ہے۔ جو بہت خستہ حالت میں ہے۔ نواب جتئی مہدوی کو اردو شاعری سے والہانہ لگاؤ تھا۔ آپ کے اشعار کا اندازہ زبان و محاورے قدیم و کئی اردو کا نمونہ پیش کرتے ہیں۔ جس میں فارسی کا کافی دخل ہے۔

گر ہو چہ ہی کلی ہی خلق میں لونی گئی جس کام تو مہلیر گا سرس پر حسن بھی ہو گا سرس
گور پر حاتم کی مارولات اب ہو کر جتنی گنج بخشی حسکی کہ چھوٹ ویسی پیش و پس

(8) سید عبدالعلی عادل ناگپوری: سید عبدالعلی عادل ان شعراء میں سے ہیں جو باہر سے آکر علاقہ دورِ بھ میں بس گئے تھے۔ اور یہیں کی خاک کا حصہ ہو گئے تھے۔ عادل میسور کے رہنے والے تھے۔ ان کے بارے میں مکمل حالات کا پتہ نہیں چلتا۔ وہ بہت بڑے عالم بلند پایہ شاعر اور کئی زبانوں کے ماہر تھے۔ اردو شعر خوب کہتے تھے۔ نمونہ کلام:

اے تیرنگہ شوخ و عیار نازک دل زن نگار

اے باعث فرح و پیش و آرام کیا حال کروں میں اپنا ارتقام

(9) بہوانی پرشاد نفیس: نفیس بھی اسی بدلتے ہوئے زمانے کے مقتدر شاعر ہیں۔ ایلچپور آپ کا وطن عزیز تھا۔ ذات کے کاستھ تھے۔ اردو زبان و ادب سے گہرا لگاؤ تھا۔ نفیس کو اردو، فارسی اور ہندی میں ایک سی مہارت حاصل تھی اور تینوں زبانوں کے الفاظ سے ان کی شاعری کا ڈھانچہ تیار ہوا۔ نفیس کا شمار اپنے دور کے مشہور شعراء میں ہوتا ہے۔ نمونہ کلام

بتوں کو سنگ دل حق نے بنایا بچاؤں شہید دل میں کہاں تک

لفظ نفرت ہے مجھ سے ورنہ اے جاں محبت ہے تمہیں سارے جہاں سے

(10) امجد حسین خطیب امجد ایلچپوری: تاریخ امجدی (چراغ بہار) جیسی نادر و نایاب فارسی وارو کی تصنیف کے خالق سید امجد حسین خطیب امجد ایک بلند پایہ تاریخ نویس تھے وہیں ایک بلند مرتبہ نعت گو اور صوفیانہ خیالات کے حامل شاعر بھی تھے۔ آپ کے کلام میں تصوف کا رنگ بدرجہ اتم پایا جاتا ہے۔ تمام کلام مذہبی رنگ میں رنگا ہوا ہے اور حضور اکرم کی شان میں تحریر کیا ہوا ہے۔

جو کوئی راہ میں اللہ کے نکل ہوگا مرتے ہی خلد میں لا ریب وہ داخل ہوگا

تج ابروئے محمد گام جو گھائل ہوگا ذہن زخم در درون ہی شائل ہوگا

دورِ بھ میں اردو شاعری کے آغاز و ارتقاء کے ضمن میں مذکورہ بالا چند نامور اور چہندہ شعراء کا کلام و حالات درج کئے گئے ہیں۔ ان کے علاوہ اور بھی بہت سے شعراء ہیں جنھوں نے اپنے کلام و اشعار سے علاقہ دورِ بھ میں اردو کی ترقی میں اہم کردار ادا کیا اس سلسلہ میں مرحوم عبدالجبار خاں، آصفی ماکاپوری کو نظر انداز نہیں کیا جاسکتا کہ مرحوم نے شاعری کے ساتھ ساتھ نثر میں مفید قیمتی اور نایاب کتابیں تحریر کر کے علاقہ دورِ بھ میں اردو کے آغاز کو سمجھنے اور ترقی و معیار کو پرکھنے میں بہت زیادہ مدد کی۔ بہر حال ان شعراء سے متعلق یہ بات وثوق کے ساتھ کہی جاسکتی ہے کہ انھوں نے علاقہ دورِ بھ میں اپنی کادشوں کلام زبان و بیان اور تقریر و تحریر سے اردو شاعری کو ہر ممکن طریقے سے فروغ اور ترقی دینے میں حصہ لیا ہے۔

حوالہ کتب :-

۱۔ دورِ بھ میں اردو شاعری، ڈاکٹر ایم۔ آئی۔ ساجد، ناشر ڈاکٹر ایم آئی ساجد کلام گاؤں، ۱۹۸۷ء

۱۳۸/۱۰۶

۲۔ دورِ بھ میں جدید اردو شاعری: ایک مطالعہ، ڈاکٹر محمد اظہر حیات، ناشر یثود گریڈ آرٹس اینڈ کامرس

کالج سننگر، ناگپور، ۲۰۱۲ء

۳۔ برار میں اردو زبان و ادب کا ارتقاء، آغا غیاث الرحمن، ناشر ادارہ ادبیات برار ناگپور، ۲۰۱۱ء
 ۴۔ ناگپور میں اردو شاعری، ڈاکٹر محمد شرف الدین ساحل، علیم پبلی کیشنز، حیدری روڈ مومن پورہ ناگپور،

۲۰۱۶ء

۵۔ ناگپور میں اردو، ڈاکٹر محمد شرف الدین ساحل، مہاراشٹر اسٹیٹ اردو اکادمی ممبئی، ۱۹۹۳ء

۶۔ تاریخ مہاراشٹر، بھائی پرمانند جی، لاجپت رائے اینڈ سنٹر تاجران کتب لاہور،

۷۔ شعرائے مہاراشٹر، خلیق الزماں نصرت، ناشر خلیق الزماں نصرت ممبئی، ۲۰۱۳ء

۸۔ سہ ماہی امکان، مہاراشٹر اسٹیٹ اردو اکادمی ممبئی، مختلف شمارے

۹۔ ماہنامہ شاعر ممبئی، مختلف شمارے

۱۰۔ ماہنامہ آجکل نئی دہلی، مختلف شمارے

۱۱۔ ماہنامہ اردو دنیا نئی دہلی، مختلف شمارے

☆☆☆

Somnath Zutshi ki Afsana Nigari ka Fan by: Dr. Qaisar Ahmad Malik

شمارہ اپریل تا جون ۲۰۲۲ Issue-57 April-June 2022

ISSN-2322-0341



ISSN 2321-4627

15/- روپے

مئی 2022ء



ماہنامہ
زبان
قومی
حیدرآباد

تعمیراتی لسانی اُردو اکیڈمی کا علمی، ادبی، لسانی و سماجی ماہنامہ

QAUMI ZABAN Monthly, Hyderabad



میراجی

تاریخ پیدائش: ۲۵ مئی ۱۹۱۲ء



دارغ دہلوی

تاریخ پیدائش: ۲۵ مئی ۱۸۳۱ء



4 ہم کلامی شاہ نواز قاسم آئی پی ایس

یادداشتیں

- 5 پرو فیسر مجید بیدار دماغ دہلوی کی فطرت اور جمالیات پسند شاعری
11 ڈاکٹر محمد اکمل خان کلام دماغ میں نکسالی زبان اور محاوروں کا التزام و انضمام
18 ڈاکٹر جعفر جری میراجی کے احوال و آثار

مضامین

- 23 ڈاکٹر یوسف حسین خان پرو فیسر مسعود حسین خان
29 رباعی کے فن کو آب و تاب عطا کرنے والا شاعر: علقمہ شبلی ڈاکٹر مقبول احمد مقبول
33 قومی یکجہتی کے فروغ میں اردو شاعری کا حصہ ڈاکٹر محمد راغب محمد طالب دیکھ
38 ہے۔ پی سعید کی شاعری کا فنی تجزیہ ڈاکٹر محمد انور الدین
43 پریم چند کے خطوط ادب اور زندگی کی تعبیر ڈاکٹر الطاف حسین نقشبندی
48 سائر لدھیانوی شبنم شمشاد
52 رومان، احتجاج اور محبت کی تثلیث کا غزل گو شاعر گلزار احمد ماگرے
57 حقیقت جانندھری کی غزلوں میں تلمیحات کا مطالعہ سنیل کمار
62 پریم ناتھ در کے افسانوں میں کشمیر رشید احمد صدیقی سلیمان اطہر جاوید کی نظر میں سردار خواجہ معین الدین (سردار سائل)

تعلیم و روزگار

- 68 اساتذہ - تبدیلی کے علم بردار ڈاکٹر مصباح انظر

افسانے

- 73 ہے کسی حد سے جب گزر جائے شریا جبین
79 ساس کو زہر دینے کا طریقہ ذیشان احمد

حصہ لقمہ

- 81 غزلیں پرو فیسر فاروق بخش / محمد نور الدین امیر
82 لقمہ عید مبارک / مزاحیہ غزل اقبال شانہ / ٹیڈ گل جگتیالی



QAUMI ZABAN Monthly, Hyderabad.

جلد : 07 شمارہ : 05 مئی 2022ء

ایڈیٹر

شاہ نواز قاسم آئی پی ایس
ڈائریکٹر سکریٹری تلنگانہ ریاستی اردو اکیڈمی

ناشر و طابع

تلنگانہ ریاستی اردو اکیڈمی

چوتھی منزل، حج ہاؤس، تاملی

حیدرآباد-500 001 (تلنگانہ)

مقام اشاعت : تلنگانہ ریاستی اردو اکیڈمی

ترتیب و تزئین : محمد ارشد مین زبیری

کپوزنگ ڈیزائننگ : محمد اعظم علی

قیمت - 15 روپے سالانہ - 150 روپے

Total Pages : 84

قومی زبان کی خریداری کے لیے چیک ڈرافٹ یا منی آرڈر
بنام ڈائریکٹر سکریٹری تلنگانہ ریاستی اردو اکیڈمی روانہ کریں اور
وضاحت طلب امور کے لیے وہیں رابطہ فرمائیں۔

☆
”قومی زبان“ میں شائع شدہ مضامین میں اظہار کردہ خیالات سے
ادارہ کا تعلق ہونا ضروری نہیں ہے۔

☆

Printed by Shah Nawaz Qasim and published by
Shah Nawaz Qasim on behalf of Telangana State Urdu Academy
Minorities Welfare Dept., Government of Telangana.
Printed at M/s. Taha Enterprises, Printing and
Packaging, 11-6-833, Red Hills, Lakdi ka Pul,
Hyderabad-500004, T.S..

Published at 4th Floor, Haj House, Nampally,
Hyderabad-500 001 Telangana State.
Ph: No. 040-23237810 Fax: 040-66362931
Email: qaumizaban.tsua2015@gmail.com
website : urduacademvts.com

قومی یکجہتی کے فروغ میں اردو شاعری کا حصہ

کے متعلق سوائے اس کے اور کیا کہا جائے کہ یہ حالات کی ستم ظریفی ہے کہ گلاب کے پھول سے اپنی خوشبو کی تعریف کرنے کے لیے کہا جائے اور سورج سے اس کی روشنی کا پتہ دریافت کیا جائے۔

قومی یکجہتی کی کب اور کہاں ضرورت نہیں تھی۔ عالمی ادبیات میں اس کی نشاندہی آسانی سے کی جاسکتی ہے۔ لیکن ہمارے ملک میں اسے ایک عمرانی نظریے کی حیثیت حاصل ہوگئی ہے۔ ایسا عمرانی نظریہ جسے اپنا کر ہی ہم ترقی کی منزلیں طے کر سکتے ہیں۔ ہماری خوش بختی یہ ہے کہ اردو جب ایک زبان کی حیثیت سے وجود میں آئی اور جب یہ زبان ادب کے قالب میں ڈھلی تو یہ قومی یکجہتی سے الگ کوئی چیز نہیں تھی۔ اردو اور یکجہتی کو لازم و ملزوم کہا جائے تو بات آسانی سے سمجھ میں آجاتی ہے۔

آزادی کے بعد قومی یکجہتی کی اہمیت صحیح معنی میں محسوس کی گئی اور اس کے منتشر عناصر کو مجتمع کرنے کی ضرورت سمجھی گئی۔ ہندوستان کی تہذیبی زندگی کا یہ بدترین المیہ تھا کہ یکجہتی کی علامت اور قومی ہم آہنگی کی علمبردار اس زبان کو سیاسی مصلحتوں کی قربان گاہ پر شہید ہونا پڑا۔ تعصب، تنگ نظری، کوتاہ اندیشی، سیاست کی کرشمہ سازی اور ”جہل خرد“ نے یہ دن دکھائے کہ اردو کو کچھ حلقے ”بدلیسی زبان“ کسی خاص مذہب کے ماننے والوں کی زبان، فرقہ پرستی کی علامت اور

ہندوستان رنگارنگ تہذیب کا گہوارہ، مختلف قوموں کی آماجگاہ، مختلف لسانی، تہذیبی، نسلی اور مذہبی اکائیوں کا ایک غیر مرئی تاگے میں پرویا ہوا ہار ایک ایسا خوبصورت ملک ہے جس میں ۷۰۰ سے زائد زبانیں بولی جاتی ہیں، ۴۷ سے زائد زبانوں میں اعلیٰ ادب کی تخلیق ہوتی ہے اور جس کی ۱۵ زبانیں قومی سطح پر تسلیم شدہ ہیں۔ آج ہم جس چیز کو بھی ہندوستانی کہتے ہیں چاہے وہ ایک لفظ ہو یا نظریہ، چاہے وہ فنون لطیفہ کی کوئی شکل ہو چاہے سیاسی ادارہ ہو یا سماجی و معاشرتی روایت، ہر ہندوستانی چیز مختلف النوع عناصر سے مرکب ملے گی۔ ہندوستان میں اختلافات کی کثرت کے باوجود تاریخ کے مختلف ادوار میں ہمیں ہندوستانی تہذیب کی تعمیر میں ایک نمایاں جذبہ اتحاد پوشیدہ ملتا ہے۔ حقیقت تو یہی ہے کہ یہی اندرونی جذبہ اتحاد ہندوستانی تہذیب کا خاص وصف ہے۔ ہندوستان جیسا وسیع و عریض ملک، اتنی کثیر آبادی اور لسانی اور جغرافیائی اختلافات کے باوجود ایک ملک اس لیے کہلاتا ہے کہ اس ملک میں ہندوستانی کا ایک غیر مرئی احساس پایا جاتا ہے جو انیکتا میں ایکتا پیدا کرتا ہے، رنگارنگی میں یک رنگی کی شان لاتا ہے اور اتفاق و اتحاد کی فضا میں اختلافات کے شعلوں کو بجھا دیتا ہے۔ اسی ہندوستان کی ایک زبان اردو بھی ہے جسے قومی یکجہتی اور رنگارنگ تہذیب کا مظہر سمجھنے اور سمجھانے کی کوششیں کی جا رہی ہیں اور ان کوششوں

(۱۲۷۳ء-۱۲۶۵ء) کا بہت سا کلام سکھوں کے گرو گرنٹھ صاحب میں دیا گیا ہے۔ ۱۳۰۰ء سے فرید ثانی کی تصنیف ہیں۔ بہاؤ الدین باجن نے بھی ان کے دوہے درج کیے ہیں اور شیرآئی نے ان کی صفت ملمع کی غزل کے پانچ شعر لکھے ہیں۔

گرو گرنٹھ صاحب میں بہت سے دوہے ایسے ہیں جو عام طور سے پڑھے جاتے ہیں لیکن ان کا انتساب نہیں درج کیا جاتا۔ ان میں صرف تین لکھے جاتے ہیں۔

کا گا کرنگ ڈھنڈھ لیا، سگلا کھائی مانس
ایہہ دویناں مت چھوینا پیا دیکھن کی آس
کا گا چونڈ نہ پنجرہ بین تو اٹھ جائے
جس پنجرے مراساہ بے تن مانس نہ کھائے
جو بن جائے تو جائے پر پیا کی پریت نہ جائے
دیکھ سکھی اجو بن کتنے، بن پریت کیے کہلائے
فکری سطح پر عشق یا بھگتی کا تصور بھی قومی بچھتی کے
شعور کا لازوال سرمایہ رہا ہے۔ عشق جس میں انسانوں کے
درمیان منافرت کی ساری دیواریں منہدم ہو جاتی ہیں۔ اور جو
ہر طرح کے امتیازات اور من و تو، کا فرق مٹا کر ایک نقطہ پر
مرکز ہو جاتا ہے۔ عشق کا یہ تصور نامدیو کا رام، گیسو دراز،
رامانند، برہان الدین جانم، رام، تلتسی، نانک، کبیر، رحیم،
رس کھاں اور اکثر مسلمان صوفی سلسلوں کے یہاں نظر آتا
ہے۔ مذہبی رسوم اور ظاہری علاقے کے خلاف علم بغاوت بلند
کرتا ہے۔ اردو میں تصوف کی تحریک بعینہ یہی رہی ہے۔ اور

ملک کی تقسیم کا سبب قرار دینے لگے۔

سولھویں اور سترھویں صدی اس اعتبار سے
ہندوستان کی تاریخ میں بڑی اہمیت رکھتی ہے کہ مقامی
زبانوں کے ادب کے ذخیرے میں کافی اضافہ ہوا۔ ایک
طرف تو فارسی میں دربار سے وابستہ افراد تذکرے و قانع
اور تراجم میں مصروف تھے اور مذہبی کتابیں لکھی جا رہی
تھیں۔ دوسری طرف کبیر، نانک، اور دوسرے صوفی اور
بھگتی خیالات سے متاثر شعراء عوامی زبان میں اپنے فلسفیانہ
افکار شعر کی زبان میں پیش کر رہے تھے۔ اس دور میں رحیم،
رس کھاں، تلتسی، کیشو، سندرسینا پتی، اور بہاری کے نام
قابل ذکر ہیں۔

اردو کی داغ بیل صحیح معنوں میں اُس وقت پڑنا
شروع ہو گئی تھی جب یہاں کی مقامی زبانوں پر عربی، فارسی،
ترکی، زبان کے اثرات پڑنے لگے تھے۔ اس زبان کو ابتداء
میں ہر جگہ ہندوی زبان کہا گیا اور اس زبان سے مراد وہی
زبان لی جاتی رہی جو باہمی میل جول کا نتیجہ تھی۔

مسعود سعید سلمان کو اس زبان کا سب سے پہلا
شاعر سمجھا جاسکتا تھا لیکن ان کا کوئی کلام اب تک دستیاب
نہیں ہو سکا۔ امیر خسرو کے ایک شعر اور دوسرے حوالوں
میں اس کا اشارہ ملتا ہے کہ انھوں نے ہندی میں کچھ شعر
لکھے۔ اس سلسلے کی دوسری اہم شخصیت خود امیر خسرو ہیں جن
کا تذکرہ صوفیوں کے ذیل میں بھی کیا جا چکا ہے۔ لیکن
امیر خسرو سے پہلے حضرت بابا فرید گنج شکر یا شکر گنج

ہے۔ اردو شاعری اردو نثر سے پہلے ارتقاء پذیر ہوئی اس لئے قومی یکجہتی کے اثرات سب سے زیادہ شاعری میں نمایاں ہیں۔ جہاں مسلمانوں نے ہندو اوتاروں کرشن، رام، ہولی، جنم اشٹھی، راکھی، شیوراٹری، ڈرگا پوجا، (دیوالی) دسہرہ، گرو ناناک پر نظمیں لکھیں وہیں ہندو شعراء نے عید، محرم، شب برات، جیسے تہواروں پر نظمیں لکھیں اور پیغمبر اسلام اور خلفائے راشدین پر نظمیں لکھیں۔ سلام اور مرثیے کہے۔ یہ سلسلہ چندو لال دیکر سے جگن ناتھ آزاد اور آگے جاری ہے۔

اردو ادب میں سب سے پہلے نظیر اکبر آبادی نے اپنی شاعری میں قومی یکجہتی کا مظاہرہ کیا۔ ہندوؤں کا شاید ہی کوئی ایسا تہوار یا اوتار ہوگا جس پر نظیر نے نظم نہ لکھی ہو۔ انھوں نے اپنی ان نظموں کے ذریعے اردو کو قومی یکجہتی کا ایک موثر وسیلہ بنایا۔ اردو شاعری کی ابتداء سے لے کر آج تک کتنے ہی شاعر ہوئے ہیں جنھوں نے قومی یکجہتی کے گیت گائے ہیں۔ قلی قطب شاہ کے کلام میں ہمیں ہندو مسلم یکجہتی کے اچھے نمونے ملتے ہیں انھوں نے بسنت کے عنوان سے کئی غزلیں لکھیں۔ جس کی زبان مخلوط ہے۔ ولی اور سراج نے بھی اپنی غزلوں میں فارسی اور ہندی الفاظ کا بہترین استعمال کیا ہے:

جن تم کھ ستی کھولو نقاب آہستہ آہستہ

کہ جیوں گل سوں نکلتا ہے گلاب آہستہ آہستہ

فائز دہلوی نے ہندوستانی ماحول اور جذبات کی بہترین ترجمانی کی ہے۔ ہندوستانی ماحول سے استعارہ اخذ کئے ہیں اور مذہبی تہواروں، پیشواؤں، سے متعلق نظمیں

اس طرح یہ بھی دور تشکیل میں قومی یکجہتی کا ایک اہم عنصر ہے۔ قلی قطب شاہ نے شمالی ہند میں فارسی شاعری کی اس حسین روایت کو جو قومی یکجہتی کی ایک بڑی علامت تھی اپنی فارسی شاعری میں سمویا۔

مرے بت کوں پوچھتے سارے بچاں
سبھی رمالاں کہو اس کا جواب
خالی ہندو کا کر مجھ کہا ہے بت پرست
سب خیالاں اپنے سکت کرتا ہے میرا خیال بہت
وجہی خالص ہندوستانی تصورات کو اپنانے کے
لئے قطب کی راکشش سے لڑائی کرواتا ہے۔ اس کے تین سر
اور چار ہاتھ ہیں اور وہ صبح اٹھ کر نو ہاتھیوں کا ناشتہ کرتا ہے:

صبح اٹھ نہاری کرے نوہتی

کہ ملعون، ہے وہ بڑا نکستی

وجہی سے ملتا جلتا دور ابراہیم عادل شاہ کا ہے۔ اُس نے خالص ہندی میں شاعری کی ہے۔ اُس کے گیت ہندوؤں کے دیوتاؤں کی مدح میں ہیں۔ اُس کی نظم نوریس، ڈاکٹر تارا چند کے اس خیال کی تائید کرتی ہے کہ ”مسلمانوں کے فلسفیانہ خیالات پر ہندوانہ اثرات کچھ کم اثر انداز نہ تھے۔ نوریس نو جذبات کا مجموعہ ہے جو ہندو فلسفے کے اعتبار سے انسان میں پائے جاتے ہیں۔ ابراہیم عادل شاہ نے اپنے ایک سکتے ”ہن نوریس“ پر اپنے نام کے ساتھ ’جگت گرو‘ کا لقب بھی کندہ کرایا۔

اردو ادب کا بیشتر ابتدائی سرمایہ شاعری پر مشتمل

ہندوؤں تک محدود نہیں تھیں بلکہ مسلمان بھی ان سے لطف اندوز ہوتے تھے۔ قلعہ معلیٰ میں بھی ہولی کی تقریب بڑے ذوق و شوق سے منائی جاتی تھی۔ شاہ عالم آفتاب سے متعدد ہولیاں منسوب ہیں جن سے معلوم ہوتا ہے کہ قلعہ معلیٰ میں پھاگ گانے، پھاگ کھیلنے اور پھاگ منگوانے کا عام رواج تھا۔

نادرات شاہی کی مختلف ہندی نظمیں پڑھنے سے معلوم ہوتا ہے کہ عید، بقر عید، آخری چار شنبہ اور عرسوں سے ہولی دیوالی وغیرہ کا اہتمام کسی طرح کم نہ ہوتا تھا۔ ان رسومات کا اثر مسلمانوں کے سماجی ادارات پر بھی ہوا۔ مسلمانوں میں شادی بیاہ کے موقع پر اہٹنا کھیلنے کی رسم بہت کچھ ہولی سے ملتی جلتی ہے۔ ہولی کے موقع پر لکھنؤ میں ہندو آج بھی آپس میں گلے ملتے ہیں۔ یہ رواج بہت کچھ عید میں مسلمانوں کے معانقہ کرنے سے ملتا جلتا ہے۔ رنگ پاشی دواشی کو کہتے ہیں۔ الفاظ گواہی دے رہے ہیں کہ ہندوؤں نے یہ نام مسلمانوں سے حاصل کیا۔

اردو شاعری کے آئینے میں مقامی تیوہاروں کی جو کیفیت نظر آتی ہے، اس سے ظاہر ہے کہ تیوہار محض مذہبی رسوم نہیں بلکہ باہمی میل جول اور معاشرتی ربط و محبت کے اہم ترین مواقع بھی فراہم کرتے تھے۔ ہندوستان کے تہذیب و تمدن کے دوسرے شعبوں کی طرح یہاں کے تیوہار بھی مختلف رنگوں کا عجیب و غریب مرکب ہے۔ لیکن ان کا تعلق چونکہ خوشی اور فراغت کے ان فطری جذبات سے ہے جو یہاں کے زمین

کہیں۔ تو میر بھی ان سے پیچھے نہیں رہے۔ انھوں نے اشنا نوں، پنگھٹوں اور ہولی وغیرہ تیوہاروں کو اپنی شاعری کا موضوع بنایا۔

قومی یکجہتی کو حصول آزادی کے لئے ایک بنیادی ضرورت تصور کیا جانے لگا، ادھر انگریزوں کی کوشش کہ ان میں اتحاد پیدا نہ ہو سکے۔ ایسے ماحول میں قومی شعور کو بیدار کرنے میں جہاں اردو اخباروں نے اہم رول ادا کیا وہاں اردو شاعروں اور ادیبوں نے بھی قومیت کے نئے تصور کو فروغ دیا۔ جہاں انھوں نے ہندو مسلمانوں کے اتحاد پر زور دیا وہیں عوام کو متحد ہو کر آزادی کے حصول کی ترغیب بھی دی۔ جس میں خواجہ الطاف حسین حالی کو اولیت حاصل ہے۔

تم اگر چاہتے ہو ملک کی خیر
نہ کسی ہم وطن کو سمجھو غیر
اقبال کی طرح اس دور کا کوئی شاعر ایسا نہیں تھا
جس نے فرقہ پرستی کے خلاف آواز نہ اٹھائی ہو اور
ہندوستانوں کو نفرت کی بجائے اتفاق اور اتحاد کی تلقین نہ کی
ہو۔ اکبر، چکبست، سیماب، ظفر علی خاں، نہ جانے اور کتنے نام
ہیں جنھوں نے اپنے اپنے طور پر قومی یکجہتی کے فروغ کے لئے
کوشش کی ہیں۔

محرّم اور دسہرہ ساتھ ہوگا
نباہ اس کا ہمارے ساتھ ہوگا
(اکبر)

مغلوں کے زمانے میں ہولی کی رنگینیاں محض

حوالہ جاتی کتب:-

- ۱۔ اردو شاعری میں قومی یک جہتی کے عناصر، سید مجاور حسین، اتر پردیش اردو اکادمی، ۱۹۸۵ء
- ۲۔ ہندوستان کی تحریک آزادی اور اردو شاعری، گوپی چند نارنگ، مختلف جلدیں۔

۳۔ شعاع ادب (حصہ اول)، ڈاکٹر سمیع اللہ، تفسا کمپیوٹرز، پرنٹ اینڈ پبلیشرز پبلیشنگ کمپنیز امرائٹی۔

۴۔ قومی یکجہتی اور اردو شاعری، ڈاکٹر ایم اظہر حیات، یثودا گرلز آرٹس اینڈ کامرس کالج، ناگپور، ۲۰۱۱ء

۵۔ اردو شاعری میں قومی یکجہتی وہم آہنگی کے رجحانات، ڈاکٹر عبدالستار، لوک نایک کالج، ایوت محل، ۲۰۱۳ء

۶۔ اردو شاعری میں قومی یک جہتی کی روایت، ڈاکٹر رام آسرا راز، مکتبہ جامعہ لمیٹڈ، دہلی، ۱۹۷۷ء

۷۔ ہندوستان میں قومی یکجہتی کی روایت، بی۔ ایس۔ پانڈے، خدا بخش اور نیشنل پبلک لائبریری پٹنہ، ۱۹۹۴ء

۸۔ ہندوستان میں قومی یک جہتی کی روایات، ڈاکٹر بشنہر ناتھ پانڈے، فخر الدین علی احمد میموریل کمیٹی، اتر پردیش

لکھنؤ، ۱۹۸۶ء

☆☆☆

ڈاکٹر محمد راغب محمد طالب دیکھ

اسوسی ایٹ پروفیسر

صدر شعبہ اردو، جی ایس سائنس، آرٹس اینڈ کامرس، کالج

کھام گاؤں ضلع بلڈانہ (مہاراشٹر)

موبائل 09422926544

و آسمان اور آب و ہوا کے اثر سے طبیعت میں پیدا ہوتے ہیں، یہاں کے تمام باشندے ان تیوہاروں سے گہرے طور پر متاثر ہوتے ہیں۔ جس طرح مسلمان ہندوؤں کے تیوہاروں میں شریک ہوتے ہیں ویسے ہی ہندو بھی مسلمانوں کی تقاریب میں شامل ہو کر حق اخلاص ادا کرتے ہیں۔

اردو شاعری میں قومی یکجہتی کے سرسری جائزے سے ہم بہ آسانی یہ نتیجہ نکال سکتے ہیں کہ از ابتداء تا حال اردو شاعری نے نہ صرف مختلف صنفی پیکروں، سانچوں، طریقوں، زاویوں سے بلکہ انسانیت کے ہر پہلو سے ہندوستانیوں کو یکجہتی اتفاق و اتحاد اور بھائی چارے کی تعلیم دی ہے۔ قدیم شعراء سے لے کر شعرائے جدید تک بلا تفریق مذہب و مسلک و ذات و شخصیت، رتبے و حیثیت وطن دوستی اور یکجہتی کے جذبے کو پروان چڑھانے اور فروغ دینے میں ہمہ تن لگے رہے۔ انھوں نے اپنی شاعری و نظموں میں ہندوستانیت و طہیت، قومیت اور یکجہتی کے ہر پہلو کو دکھانے، برتنے اور نبھانے ہم آہنگی و بھائی چارے کے جذبے کو ہر ہندوستانی کے دل میں ابھارنے اور اس گنگا جمنی تہذیب و مشترکہ وراثت کو سنبھالنے، قائم رکھنے اور مل کر اس کی حفاظت کرنے کا جو سبق اردو شاعری کے وسیلے سے دیا ہے وہ ہر لحاظ سے دلنشین، قابل ستائش، مسلم و مستحکم ہے۔ اہل نظر خود بھی اس کی قدر و قیمت آ تک سکتے ہیں کہ اردو یکجہتی کے جذبے کی نگہد اور ترجمان ہے۔

تلنگانہ ریاستی اردو اکیڈمی

ISSN - 2582 - 3612

سائنس اور مناہجہ

یو۔ جی۔ سی۔ کیئرلسٹ جرنل

جلد: ۴ شماره: ۱۴

(جولائی تا ستمبر ۲۰۲۲ء)

مدیر اعلیٰ (اعزازی)

پروفیسر سید ان ظفر

R.N.I. No. : BIH URD/2019/78036

Quarterly

SAGHAR E ADAB

Muzaffarpur

(UGC CARE - List Journal)

جلد : ۴ شماره : ۱۳ جولائی تا ستمبر ۲۰۲۲ء
 مدیر اعلیٰ (اعزازی) : پروفیسر سید آل ظفر
 مدیرہ : کہکشاں یاسمین

زیر تعاون

فی شمارہ : 300 روپے، سالانہ 1,300 روپے (بذریعہ رجسٹرڈ ڈاک)، تا حیات 15,000 روپے، دیگر ممالک 60 ڈالر

صفحات : ۴۰۰

تعداد اشاعت : ۵۰۰

سرورق : سید آل مختتم، سید آل حاشر و فائزہ ظفر

کیپوزنگ : امام الدین امام، جے۔ این۔ یو، نئی دہلی۔ +91 62061 43783

Bank Details

SAGHAR E ADAB, Saving A/c No. 37510 50251

IFSC : CBIN 0284935

Central Bank of India, L.S. College Branch, Muzaffarpur (Bihar) India

اس شمارے کے قلم کاروں کی آراء سے "ساغر ادب" کے مدیر اعلیٰ کا متفق ہونا ضروری نہیں۔

کسی بھی قابل اعتراض تحریر یا دیگر متنازعہ معاملات کی قانونی چارہ جوئی صرف مظفر پور عدالت ہی میں ہوگی۔

خط و کتابت و ملنے کا پتہ**CHIEF EDITOR****SAGHAR E ADAB**

Husaina House, Zakaria Colony, Mohalla - Sadpura

P.O. - Ramna, Muzaffarpur - 842 002 (Bihar) India

Mob. +91 94300 84261, +91 90062 53903

ڈاکٹر محمد راغب دیشکھ

اُردو خاکہ نگاری کا آغاز و ارتقا

ادب ایک ایسا آرٹ ہے جس میں فن کار کے تجربات، تاثرات، جذبات اور خیالات لفظوں کی مدد سے ایک خاص شکل اختیار کرتے ہیں۔ ہر شعری و نثری مصنف مخصوص شکل اور اوصاف رکھتی ہے اور تقریباً تمام ادب کی اصناف کا مقصد زندگی کی خاص اداؤں کی تصویر کشی ہوتا ہے۔ خلافت ذہن کی قوت بے پناہ ہوتی ہے۔ ایک خیال لاصح و خیالات کی تحریک کا باعث ہوتا ہے۔ اور اس ایک خیال سے سینکڑوں باتیں وجود میں آتی ہیں۔ خیالات کو متعین کر کے کوئی صنفی ہیئت عطا کرنے کے لیے ماہرین ادب نے چند سانچے بنائے ہیں۔ بعض اصناف فنی اعتبار سے بے ظاہر تو بہت سادہ نظر آتے ہیں لیکن حقیقت میں بہت پیچیدہ ہوتی ہیں۔ خاکہ نگاری ایسی ہی صنف ہے۔ اس کو اشاروں کا آرٹ کہا جاتا ہے۔ اس میں اتنی وسعت ہوتی ہے کہ ایک پھول کے مضمون میں تمام گلشن کی روح بند کی جاسکتی ہے۔ خاکہ میں زندگی کے ہر پہلو کو سولینے کی بڑی صلاحیت ہے۔ ڈاکٹر ظلیق انجم لکھتے ہیں کہ:

”خاکہ نگاری بہت مشکل اور کٹھن فن ہے اسے اگر نثر میں غزل کا فن کہا جائے تو

غلط نہ ہوگا۔ جس طرح غزل میں طویل مطالب بیان کرنے پڑتے ہیں، ٹھیک

اسی طرح خاکہ میں مختصر الفاظ میں پوری شخصیت پر روشنی ڈالنی پڑتی ہے۔“

خاکہ نگاری کی ایک عظیم روایت ہمارے سامنے ہے۔ خاکہ نگاری جسے شخصیت نگاری کے نام سے بھی ہم جانتے اور سمجھتے ہیں ہر عہد، ہر ملک اور ہر زبان میں اس کے نمونے اور نقوش ملتے ہیں۔ انسانی تاریخ کے اوراق اس کے شاہد ہیں کہ کسی شخصیت سے متاثر ہونا، اس سے عقیدت و قربت، محبت اور محبوبیت ایک فطری امر ہے، جس سے کوئی انکار نہیں کر سکتا۔ وہ شخصیت کوئی بھی ہو سکتی ہے۔ زندگی اور زمانے کے بدلتے ہوئے مزاج و میلان، تخیل و فرائز ڈھتی و بھرتی انسانی زندگی کے تمام رنگ و روپ خاکہ نگاری میں دیکھنے اور پڑھنے کو ملتے ہیں۔ معاملہ مذہبی ہو یا پھر معاشرتی و سماجی، علمی و ادبی ہو یا سیاسی، بڑی شخصیت ہو یا معمولی، عالم ہو یا جاہل، حکمران ہو یا سانج کا ایک ادنیٰ انسان، مصنف کسی سے بھی متاثر ہو سکتا ہے اور کسی شخصیت کو موضوع و محور بنا سکتا ہے۔ خاکہ نگاری بے حد نازک فن ہے۔ یہاں قلم پر بے پناہ گرفت کے ساتھ

ساتھ جرات اور سلیقہ مندی بھی درکار ہے۔ تھوڑی سی لاپرواہی اور کوتاہی خاکہ کو مجروح کر دیتی ہے۔ اس لیے مصنف کو بہت ہی احتیاط اور صبر و ضبط کا مظاہرہ کرنا پڑتا ہے۔ ایک ایک قدم بہت سوچ سمجھ کر بڑھانا ہوتا ہے۔ ایک ایک پہلو اور گوشے کو مصنف کو ملحوظ رکھنا ہوتا ہے۔ اس لیے دنیا کی مختلف زبانوں میں بے شمار خاکے لکھے گئے مگر شاہکار کا درجہ کم ہی کے حصے میں آیا۔

خاکہ نگاری لفظ SKETCH کا مترادف ہے جس کے لفظی معنی اس نقشہ کے ہیں جو صرف حدود کی لکیریں کھینچ کر بنایا جائے یا ڈھانچہ تیار کیا جائے۔ اصطلاحی معنوں میں خاکہ سے مراد وہ نثری تحریریں ہیں جن میں کسی شخصیت کی مرتق کشی کی گئی ہو۔ اس لیے کہا جاتا ہے کہ خاکہ نگاری شخصیت کی عکاسی کا فن ہے جس میں خاکہ نویس کسی شخص کی زندگی سے متعلق اہم اور مخصوص حالات و واقعات، اس کی منفرد خصوصیات، ظاہری و باطنی اوصاف، عادات و اطوار، حرکات و سکنات، اس کے حلیہ، لباس، رہن سہن اور طرز گفتگو کو ایجاز و اختصار کے ساتھ اس چابکدستی سے بیان کرتا ہے اور اس کی نفسیات، مزاج، افتاد طبع پر اس طرح روشنی ڈالتا ہے کہ اس انسان کی پوری شخصیت، جلتی جاتی، چلتی پھرتی قاری کی نگاہوں کے سامنے جلوہ گر ہو جاتی ہے۔ خاکہ نگاری کی دلکش تصویر کشی کا نام ہے مگر ضروری ہے کہ یہ تصویر جاذب نظر اور دلچسپ ہونے کے ساتھ ساتھ حقیقت سے دور نہ ہو اور زندگی اور اس کی حرکت و حرارت سے بھرپور ہو۔ اس لیے خاکہ نگار کو چاہئے کہ وہ شخصیت کو بغیر کسی مبالغہ آرائی اور جانبداری کے پیش کرے اور اس کے بیان میں تعریف و تہنیت یا مدح سرائی سے کام نہ لے بلکہ حقیقی اور ہمدردانہ انداز اپنائے۔ ڈاکٹر شاد احمد فاروقی نے خاکہ کی تعریف ان جملوں میں کی ہے۔ وہ لکھتے ہیں:

”اچھے کھینچ کی تعریف ہی یہ ہے کہ بعض گوشوں کی نقاب کشائی ایسی ماہرانہ

نفاست کے ساتھ کی جائے کہ اس شخصیت کا خاص تاثر پڑھنے والے کے ذہن

میں خود بخود پیدا ہو۔ اچھا خاکہ وہی ہے جس میں کسی انسان کے کردار اور افکار

دونوں کی جھلک ہو۔ خاکہ پڑھنے کے بعد اس کی صورت، اس کی سیرت، اس

کا مزاج، اس کے ذہن کی افتاد، اس کا زاویہ نگاہ، اس کی خوبیاں اور خامیاں

سب نظروں کے سامنے آجائیں۔ شاعری میں مبالغہ ہو سکتا ہے، نثر میں

عبارت آرائی اور تخیل کی آمیزش ہو سکتی ہے لیکن خاکہ نگاری ایسی صنف ہے جس

میں رد و رعایت ہو یا مبالغہ اور مدح سرائی ہو تو پھر وہ خاکہ نہیں رہتا۔“

ڈاکٹر اشفاق احمد روک خاکہ کی تعریف کرتے ہوئے رقم طراز ہیں:

”خاکہ لفظوں سے تصویر تراشنے اور کسی شخصیت کی نرم گرم پرتیں تلاشنے کا وہ

لطیف فن ہے، جو شوخی، شرارت، ذہانت، زندہ دلی اور نکتہ آفرینی کے ہم رکاب ہو کر میدان ادب میں بار پاتا ہے۔ خاکہ انگریزی لفظ Sketch کا مترادف ہے جس کے معنی ڈھانچہ، کچا نقشہ یا لکیروں کی مدد سے بنائی ہوئی تصویر کے ہیں لیکن ادبی اصطلاح میں اس سے مراد وہ تحریر ہے جس میں نہایت مختصر طور پر، اشارے کنائے میں کسی شخصیت کے ناک نقشہ، عادات و اطوار اور کردار کو فن کارانہ انداز اور روانی و جولانی کے ساتھ بیان کر دیا جائے۔ اس میں جواب مضمون کی ہی پیچیدگی درکار ہوتی ہے، نہ یہ سوانح کی سی باقاعدگی اور ذمہ داری کا متحمل ہو سکتا ہے۔ خاکہ کسی شخص یا شخصیت سے وابستہ عقیدت، احترام، محبت، دلچسپی یا یادوں کی ایک ایسی لفظی تصویر ہوتی ہے جو کسی جگہ سے نہایت بے ساختہ انداز میں شروع ہو کر کسی مقام پر غیر روایتی انداز میں ختم ہو جاتی ہے۔“ ۳

خاکہ میں شخصیت کی سیرت و صورت کو ضرور بیان کیا جاتا ہے مگر خاکہ نگاری، سوانح نگاری اور خودنوشت سوانح نگاری سے جداگانہ صنف ہے۔ سوانح اور خودنوشت سوانح میں کسی شخص کی پوری زندگی کے حالات و واقعات کو تفصیل سے بیان کیا جاتا ہے جب کہ خاکہ میں کسی فرد کی زندگی اور اس کی شخصیت سے متعلق چند انوکھے اور منفرد پہلوؤں کو اس فن کاری سے بیان کیا جاتا ہے کہ اس شخص کی زندہ جاوید تصویر نگاہوں کے سامنے گھوم جائے اور ذہن پر اس کا نقش قائم ہو جائے۔

یہ بات کہی جاسکتی ہے کہ خاکہ شخصیت کی تصویر کو لفظوں میں ڈھالنے کا نام ضرور ہے مگر یہ چند فنی لوازم کا متقاضی ہے۔ خاکہ ایک ادبی صنف ہے۔ دوسری ادبی اصناف کی طرح اس کے بھی فنی لوازمات ہیں جن کی پابندی کرنا خاکہ نگار کے لیے ضروری ہوتا ہے۔ خاکہ کے فنی لوازمات جسے ہم اس کے اجزائے ترکیبی بھی کہہ سکتے ہیں یہ ہیں۔

اختصار (۲) شخصیت (۳) واقعہ نگاری (۴) کردار نگاری (۵) منظر کشی (۶) حلیہ یا سراپا نگاری

(۷) تاثر

اختصار کا میاب و مکمل خاکہ کسی وقید و بند کا حامل نہیں ہوتا وہ مولوی عبدالحق کے ”حکیم امتیاز الدین“ کے خاکہ کی طرح ڈیزدہ صفحے پر مشتمل ہو سکتا ہے۔ اور مرزا فرحت اللہ بیگ کے ”نذیر احمد کی کہانی“ کچھ ان کی کچھ میری زبانی، دوزخی، آپ، گنجینہ گوہر اور گنجائے گرانمایہ“ کی طرح طویل بھی ہو سکتے ہیں۔ مختصر خاکوں کو طویل خاکوں کے مقابلے میں بہترین سمجھا جاتا ہے۔ طوالت کی وجہ سے یہ خاکے مکمل تاثر کو

پوری طرح قائم نہیں رکھ پاتے۔ خاکے میں غیر ضروری طوالت سے اجتناب ضروری ہے۔ خاکے میں اختصار پیدا کرنا بہت مشکل ہوتا ہے اختصار کا وصف ہی خاکے کو دوسری صنف ادب سے ممتاز رکھتا ہے۔

شخصیت سے قربت اور شخصی تاثر: خاکے کا ایک اہم وصف شخصیت سے قربت ہوتا ہے۔ شخصی شناسائی اور قربت سے خاکہ نگاری شخصیت کے ظاہری اور باطنی حدود کو کامیابی سے بیان کر سکتا ہے۔ خاکہ نگاری کے بعض پہلوؤں میں ہم آہنگی اور یکسانیت خاکے کی محرک بنی ہے تو کئی مخصوص ہستیوں کی جدائی نے خاکے کو لکھوادے جیسے مولوی عبدالحق نے نام دیو مالی اور نور خاں کو اپنے اظہار کے ذریعہ حیات جاوید بخشی اور رشید احمد صدیقی نے بھی غیر معمولی شخصیات کنڈن اور حسن عبداللہ پر قلم اٹھایا۔

خاکہ نگاری کے لئے یہ بھی ضروری ہے کہ خود خاکہ نگار بھی ایک عظیم شخصیت کا مالک ہوتا کہ وہ کسی بھی شخصیت کی مرقع کشی اور تشریح بہتر طریقے سے کر سکے۔ ایک اچھا خاکہ نگار وہی ہوتا ہے جو شخصیت کی عظمت یا کمتری کو اپنے کام میں روکاؤٹ نہیں بننے دیتا اور اپنے عمل کو موضوع میں ہمدردی کے باوجود غیر جانب دارانہ طور پر جاری رکھتا ہے۔

واقعہ نگاری: خاکہ میں کسی انسان کی سیرت اور کردار کی خصوصیات بیان نہیں کی جاتی بلکہ پڑھنے والوں کو ان کی جھلک دکھائی جاتی ہے۔ اس میں زندگی کے حقیقی واقعات کو سامنے رکھ کر ان میں سے چند ایسے واقعات کا انتخاب کیا جاتا ہے جو اس کی سیرت کو پوری طرح بے نقاب کر سکیں۔ خاکہ نگاری میں بیان کا دھیان رکھا جاتا ہے بیان ایسا ہونا چاہیے کہ پڑھنے والے کو واقعہ اپنی نظروں کے سامنے چلتا پھرتا اور منہ بولتا نظر آئے۔ اس لئے ایک خاکہ نگار کو خاکہ نگاری کے لئے اچھا واقعہ نگار اور قصہ طراز ہونا بھی ضروری ہے۔

کردار نگاری: کردار نگاری کی روایت قدیم ہے ادب میں اس کی ابتدا، بقوں، مثنویوں، داستانوں، اور تہذیبوں سے ملتی ہے۔ یہ ایک مشکل فن ہے لیکن کردار نگاری کے بغیر خاکہ بے جان ہوتا ہے۔ کردار نگاری خاکہ میں ایک خصوصی اہمیت رکھتی ہے خاکہ نگار اپنے موضوع کی انفرادی خصوصیت کو اجاگر کرتا ہے۔ کردار کی اسی اہمیت کی بنا پر انگریزی ادب میں اس کی ابتدا سترھویں صدی میں ہوئی۔ انگریزی میں جو خاکے لکھے گئے تھے انہیں کردار سے موسوم کیا گیا۔

منظر کشی: منظر کشی واقعات نگاری کا ایک جز ہے۔ کسی حالات کی کیفیت کا منظر ایسا کھینچا جائے کہ اس کی چلتی پھرتی تصویریں آنکھوں کے سامنے آجائیں۔ جیسے دریا کی آواز، سیم کے جھوٹے، جنگل کی روانی، گرمی کی تپش، صبح کا موسم، شام کا وقت، چاند کی چاندنی، رات کا ستانا، وغیرہ کا بیان اس طرح سے ہو کہ آنکھوں کے سامنے آجائے اور اس کا نقشہ دماغ میں بیٹھ جائے۔ مصنف کو چاہیے کہ کیسا بھی منظر ہو اس کی منظر کشی اس انداز میں کی جائے کہ وہ سچ معلوم ہو۔ موسموں کا بیان، قبیلوں کے نقشے، میلے ٹھیلے، تیوہار، ناچ

گائے، رنگ، ہوا، بارش کو قلم سے ایسا رنگ دے کہ قارئین کے دماغ میں اس کی پوری تصویر کھینچ جائے۔
سراپا نگاری: یہ خاکہ نگاری کا اہم وصف ہے جس میں ضد و خال عادت و اطوار کو ابھار کر پیش کیا جاتا ہے۔ ظاہری اور باطنی گس سے خاکے کی دلچسپی میں اضافہ ہوتا ہے۔

وحدت تاثر: دوسری اصناف کی طرح خاکہ میں بھی وحدت تاثر کا ہونا ضروری ہوتا ہے۔ خاکہ نگار مختلف حالات، واقعات، بیانات اور مکالموں کو ایک خاص ترتیب میں مرتب کرتا ہے وہ تمہید کے بعد کے حصے کو اس طرح بیان کرتا ہے جس سے خاکہ میں وحدت تاثر ابتدا سے آخر تک قائم رہے۔ مختلف معنی کے یہاں اس کے رنگ اور اثرات بھی مختلف پائے جاتے ہیں۔ جن کے یہاں تاثرات میں وحدت پائی جاتی ہے وہ کامیاب خاکہ قرار دیا جاتا ہے۔

شاعری میں جس طرح رباغی کا فن تسلیم کیا گیا ہے، ٹھیک اسی طرح اصناف نثر میں خاکہ نگاری کی صنف بھی تسلیم کی گئی ہے۔ صنف کو اپنی تیسری آنکھ کا بھی استعمال کرنا پڑتا ہے۔ اس لیے اردو میں مرزا فرحت اللہ بیگ سے لے کر فنسٹر تک بے شمار خاکے لکھے گئے ہیں۔ سیکڑوں کی تعداد میں خاکوں کے مجموعے مظہر عام پر آچکے اور آ رہے ہیں مگر ان میں چند خاکہ نگار ہی ہیں جو اپنی منفرد و مخصوص پہچان بنانے میں کامیاب ہوئے ہیں۔ غالب پر مالک رام کا لکھا ہوا خاکہ، پروفیسر رشید احمد صدیقی کا اپنے شعبہ اردو کے چہرے کی کنڈن کا خاکہ اور خود مستند و محترم ادیب و ناقد پروفیسر نظیر صدیقی کا مرحوم نظیر صدیقی کے نام کا خاکہ آج بھی پڑھنے والے بھول نہیں سکتے۔

اردو خاکہ نگاری آج ترقی کی کئی منزلیں طے کر چکی ہے۔ جس صنف خاکہ نگاری کی ابتدا مرزا فرحت اللہ بیگ سے ہوئی ہو اور دیکھتے دیکھتے اردو خاکہ نگاری کی جدید تاریخ میں کئی ایسے اہم خاکہ نگار ابھر کر سامنے آئے جن کی خاکہ نگاری نے اس صنف کو ایک نئی تازگی و توانائی، دلکشی و کشمکش اور ادبی وقار و معیار بخشنے کا کام انجام دیا، ہم کہہ سکتے ہیں کہ اردو خاکہ نگاری کی اس تابندہ و درخشندہ روایت کو فرحت اللہ بیگ کے بعد کی آنے والی نسلوں نے نہ صرف پروان چڑھایا بلکہ دنیا کی معتبر و مستند زبانوں کے مد مقابل کھڑا کرنے کا کام بھی انجام دیا۔ 1970 کے بعد صنف خاکہ کی طرح دوسری اصناف سے تعلق رکھنے والے دانشوروں، ادیبوں اور شاعروں نے بھی خاکہ نگاری کے باب میں کئی اضافے بھی کیے۔

اردو میں خاکہ نگاری کی ابتدا باضابطہ طور پر جیسا کہ ذکر کیا جا چکا ہے مرزا فرحت اللہ بیگ کی تحریروں "نذیر احمد کی کہانی کچھ ان کی اور کچھ میری زبانی"، "دلی کا ایک یادگار مشاعرہ" اور "ایک وصیت کی تعمیل" وغیرہ سے ہوئی۔ مرزا فرحت اللہ بیگ کے بعد جو خاکہ نگار سامنے آئے ان میں خواجہ حسن نظامی، آغا حیدر حسن، مولوی عبدالحق، شاہد احمد دہلوی، اشرف صبوحی، رشید احمد صدیقی، سردار دیوان سنگھ مفتون،

جوش ملیح آبادی، خواجہ محمد شفیع دہلوی، مرزا محمود بیگ، مالک رام، منٹو، عصمت چغتائی، شوکت تھانوی، محمد طفیل، سید اعجاز حسن، کنھیالال کپور، شورش کاشمیری، نگر تو نسوی، چراغ حسن حسرت، خواجہ غلام السیدین، مجید لاہوری، عبدالمجید سالک، کرشن چندر، ظ۔ انصاری، حامد جلال، احمد بشیر اور قرۃ العین حیدر وغیرہ کے نام قابل ذکر ہیں۔ ان کے علاوہ خواجہ احمد فاروقی، خلیق انجم، اسلم پرویز، ڈاکٹر عبادت بریلوی، سید تمیز جعفری اور قدرت اللہ شہاب وغیرہ نے بھی عمدہ خاکے لکھے ہیں۔ عصر حاضر کے نمائندہ اور ممتاز خاکہ نگار نجیب حسین ہیں۔ ان کے علاوہ جن ادیبوں نے اس فن کو وسعت دی ان میں انتظار حسین، یوسف ناظم، عابد سہیل اور اقبال مسین وغیرہ کا نام قابل ذکر ہے۔ آج بھی اردو میں خاکہ کو غیر معمولی مقبولیت حاصل ہے۔ یہی وجہ ہے کہ یہ صنف عصر حاضر میں بھی جس طرح ترقی کے منازل طے کر رہی ہے، وہ اس کے روشن مستقبل کی ضمانت ہے۔ خاکہ نگاری کی بروہتی مقبولیت اور اس کی ترقی کو دیکھتے ہوئے یہ کہنے میں کوئی تاثر نہیں کہ خاکہ قلمیاً اردو کی بے حد مقبول اور ترقی یافتہ صنف ہے اور یہ اردو نثر کی آبرو بھی ہے۔

حوالے:

- ۱ ڈاکٹر صابرہ سعید، اردو ادب میں خاکہ نگاری
- ۲ ڈاکٹر ثارا احمد فاروقی، اردو میں خاکہ نگاری، مشمولہ، دیور دیافت
- ۳ ڈاکٹر اشفاق احمد درک، آزاد: اردو کا پہلا خاکہ نگار، مشمولہ، موقف
- ۴ پروفیسر شمیم خنی، مرتب: آزادی کے بعد دہلی میں اردو خاکہ، ص ۶۹، ۱۱
- ۵ ڈاکٹر صلاح الدین، مرتب: دلی والے، ص ۵۲

Dr. Mohammad Raghieb Deshmukh

Head

Department of Urdu

G. S. Science, Arts & Commerce College

Khamgaon

Buldana (Maharashtra)

Mob.- 94229 26544



SPECIES RICHNESS OF ANTS IN KATOL, DIST. NAGPUR (M.S.)

¹Kale G.B. and ²Ghait S.N.

¹Associate Professor and Head, Department of Zoology, G.S. Science, Arts and Commerce College, Khamgaon, Dist.Buldana (M.S.) 443303

²Asstt. Teacher, Nagar Parishad Highschool, Katol Dist.Nagpur (M.S.) 441302

ABSTRACT

The study was carried out to measure the species richness of ants in Katol town area. All out search and photographic methods were used to observe ants. We found 10 species of ants belonging to 10 genera under 4 subfamilies at different locations. The subfamily Myrmicinae was the most dominant in terms of species richness; with 4 species(40%), while subfamily Formicinae and Myrmicinae recorded with equal number of species(40%) . Least number found with subfamily Dolichoderinae(10%) and Pseudomyrmicinae (10%).

Key words:- Ant Diversity, Formicinae, Oecophylla, Species Richness, Katol.

INTRODUCTION:

Arthropods constitute the vast majority of global animal biodiversity. Among arthropods, ants are considered as ecologically dominant in most terrestrial environments. While ants have been increasingly appreciated as an indicator group in some regions (Bestelmeyer and Wiens 2001, Andersen *et al.*, 2004), Insects constitute 85% of the world's animal biodiversity (Groombridge, 1992). Inclusion of ground-dwelling arthropods in environmental assessment surveys and biodiversity inventories has increased in the recent past (Oliver and Beattie, 1996).

Among the Arthropods, the ants are considered one of the most diverse, abundant and ecologically significant organisms on the earth. Ants, prominent invertebrate group used in assessing ecological responses are one of nine proposed indicators (Underwood and Fisher, 2006). Ants are abundant insects and are considered important in ecosystem functioning. They have diverse ecological roles, including nutrient cycling, seed dispersal and population regulation of other insects (Holldobler and Wilson 1990; Folgarait, 1998).

Ants are known to be an important part of ecosystems not only as they constitute a great role of the animal biomass but also because they act as ecosystem engineers. It performs major ecological functions. They are important seed dispersers, invertebrate predators, scavengers, and competitors, ground-dwelling ants exert a strong impact on the arthropods (Holldobler and Wilson, 1990). In addition, they play important part in the transfer of organic materials, movement of soil and gives better aeration (Agosti et al., 2000). The most diverse and ubiquitous groups of the social insects (Bolton, 2011), ants are eusocial (Gadakgar et al., 1993). Ant species helps in monitoring environmental impacts, eco-social projects and tools in ecological studies (Andersen, 1990).

This study is the first preliminary report from the area with a focus to investigate the species richness of ants.

MATERIALS AND METHODS:

Study Area: The study area is a Katol town, a Tahsil place situated in Nagpur district in the state of Maharashtra, India. The average elevation is 1669ft asl. It receives rainfall both from the South-West during June to September and North-East during November to December. The vegetation of Katol tahsil area is of the dry deciduous type.

The present study was carried out in an attempt to understand and measure the status of ant diversity in selected areas (1) Residential area; it includes two accommodation campus, schools and colleges.(2) Cultivated land (Cotton field, Orange farms, Jowar, Soya bean farms, etc). These sites are located nearby the city and have good tree cover. Over all city is situated at the base of hilly area of Satpuda ranges and covered with greenery. All the sits selected for survey are surrounded with well plantation. The data were collected for a period of six months, from June 2020 to November 2020.

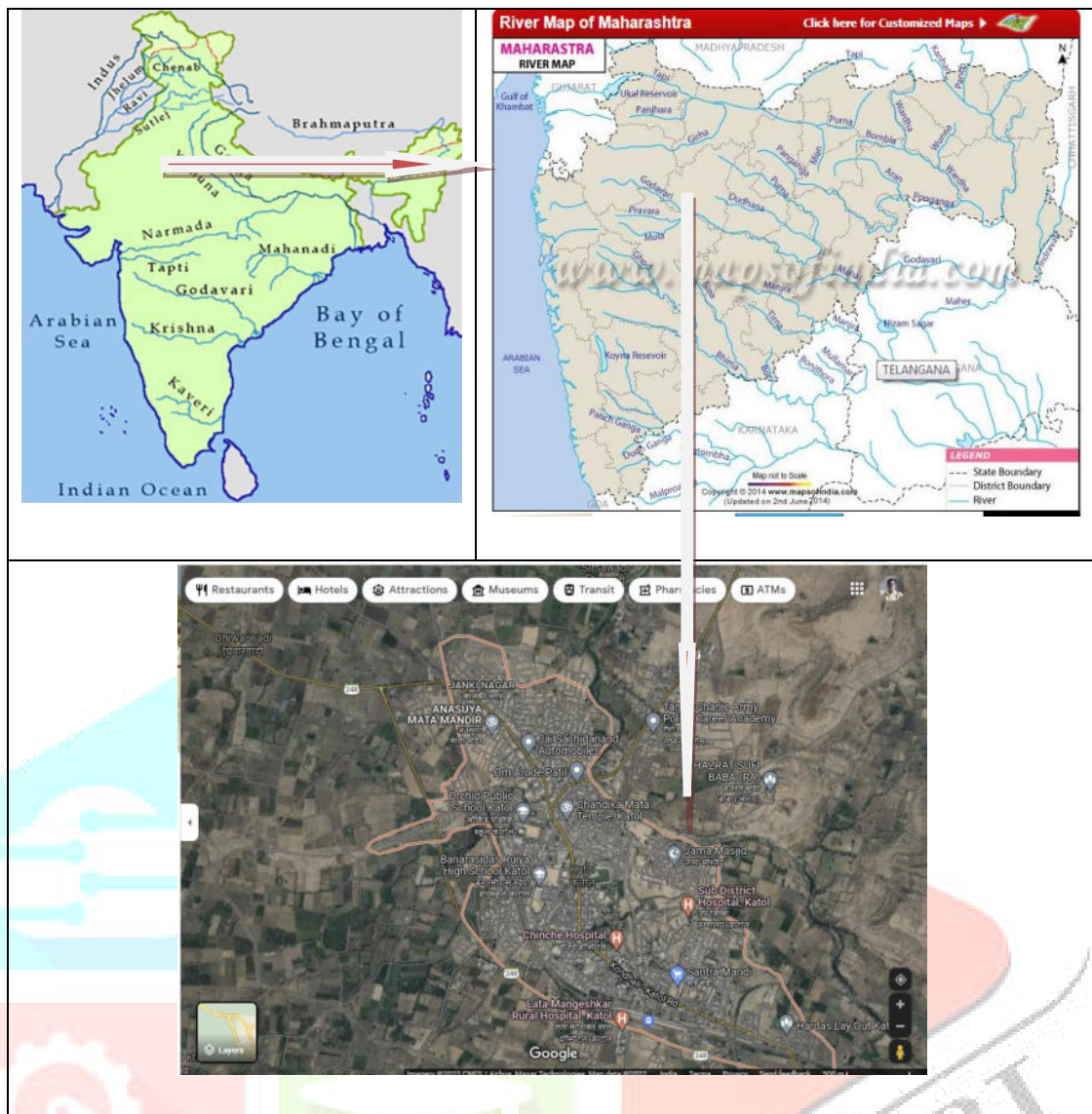


Fig. Geographical location of the study area (Source: Google maps and Maps of India)

Sampling :Sampling was performed using following methods:

All-Out Search Method: The most commonly used method is all-out search method. The ants were just picked up by hand using brushes or forceps. Care was taken to collect all castes from a colony in the case of polymorphic species, because the phenomenon of polymorphism can lead to major confusions, during sorting and identification.

Photographic Method: Photographs were taken using Canon digital camera. More time spent for good quality photographs. This method helps to conserve the biodiversity instead of pit fall, traps and other insect killing methods. Well captured photos selected for identification.

Identification:Sampled ant species that were photographed and identified using stranded identification manuals given by Ali (1992), Bingham (1903), Bolton (1994), Rastogi (1997), Tiwari (1999), Varghese *et. al.*, (2002 and 2003). In the laboratory, the samples were separated and identified to genus level and species level.

RESULTS AND DISCUSSION:

Total 10 species belonging to 10 genera, that spread over 4 subfamilies (Table No.1) were recorded. Of the 4 subfamilies, the Myrmicinae (40%) was the most dominant subfamily in terms of species richness with 4 Species, while subfamily Formicinae and Myrmicinae recorded with equal number of species (40% each). Least number found with subfamily Dolichoderinae(10%) and Pseudomyrmicinae (10%). During the present investigation comparatively lower species diversity 3(30%) was observed in residential area and high diversity of species 7(70%) was noticed under non residential area.

Sr.No.	Subfamily	Genus	Species
1.	Formicinae	<i>Camponotus</i>	<i>compressus</i>
2.		<i>Paratrechina</i>	<i>longicornis</i>
3.		<i>Oecophylla</i>	<i>smaragdina</i>
4.		<i>Lepisiota</i>	<i>fraunfeldi</i>
5.	Myrmicinea	<i>Monomorium</i>	<i>indicum pharaonis</i>
6.		<i>Crematogaster</i>	<i>ransonneti</i>
7.		<i>Solenopsis</i>	<i>geminata</i>
8.		<i>Pheidol</i>	<i>indica</i>
9.	Dolichoderinea	<i>Tapinoma</i>	<i>melanocephalum</i>
10.	Pseudomyrmicinea	<i>Tetraoponera</i>	<i>rufonigra</i>
TOTAL	04	10	10

Table No.1. Subfamily wise distribution of Ant's species in Katol area.



(A) Paratrechina longicornis



(B) Oecophylla smaragdina

(C) *Tetraponera rufonigra*(D) Nest of *Oecophylla smaragdina*(E) *Lepisiota fraunfeldti***Fig.A,B,C,D and E:Photographs of some the ant species observed in the study area.**

As most important components of ecosystems not only because they constitute a great part of the animal biomass but also because they act as ecosystem engineers. All the known species of ants are eusocial (Gadagkar *et al.*, 1993). Environmental changes have an impact on Macroarthropod abundance (Pearson and Derr, 1986; Adis and Latif, 1996). Many ant species are highly sensitive to the microclimate fluctuations and to habitat structure, and thus respond strongly to environmental change (Anderson, 1990; Alonso *et al.*, 2000). Therefore as locations get affected by human activity the distributions of ant also get varied. During this study, non residential, forest, grasslands, urban gardens area etc. represented higher number and diversity of ant. Similarity measurement depicts that forest habitat maximum ant species diversity. It also depicts that highest number of ant species (70%) are present forest habitat and also indicate a favourable microclimatic condition. Low diversity, in human residential areas (30%) i.e. index value indicates non –favourable condition for the ants species. Sunil Kumar *et al.* reported that the ant diversity is directly proportional to the diversity of vegetation. Then as the disturbance gets increased the pattern of ants also gets changed with its diversity (Ghait and Kale, 2015).

Lily Leahy *et.al.* (2020) ,studied diversity and distribution of the dominant ant genus *Anonychomyrma* (Hymenoptera: Formicidae) in the Australian Wet Tropics distribution modelling of the nine commonest species identified maximum temperature of the warmest month, rainfall seasonality, and rainfall of the wettest month as correlates of distributional patterns across subregions. This study supported the notion that *Anonychomyrma* radiated from a southern temperate origin into the tropical zone, with a preference for areas of montane rainforest that were stably cool and wet over the late quaternary.

We investigated that *Oecophyla smaragdina* found mainly on Mango trees as well as noticed on Almond trees having large leaves. It recorded with its nest build with the help of sticking leaves together. Secondly, a well-known ant for building its nest where sandy and rocky soil present was the *Solenopsis geminata*. As Katol is surrounded by hills and forest area, and rocky soil found, *S.geminata* species is abundantly found in compared to other species.

CONCLUSION:

Ants are sensible towards suitable environmental conditions and are attracted towards a particular location avoiding disturbed area. Furthermore, ants are the bio-indicators of nature, habitat and environment. More work is necessary to conclude more information from this area.

REFERENCES:

- Adis, J. and Latif, M. (1996). Amazonian Arthropod Respond to *El Nino*. *Biotropica*. 28, 403-408.
- Ali, T.M. (1992), Ant fauna of Karnataka. *IUSSI Newsletter* 6: 1-7.
- Alonso, L.A. and Agosti, D. (2000). Biodiversity Studies, Monitoring, and Ants: An Overview. In Ants. Standard Methods for Measuring and Monitoring Biodiversity. – *Biological Diversity Hand Book Series*. Washington and London, 280 pp.
- Anderson, A.N. (1990). The Use of Ant Communities to Evaluate Change in Australian Terrestrial Ecosystems: A Review and Recipe. *Proceedings of Ecological Society Australia*.16, 347-257.
- Bingham C. T. (1903).The Fauna of British India, including Ceylon and Burma.Hymenoptera. *Ants and Cuckoo-Wasps*. 2. Taylor and Francis, London, 506 pp.
- Bolton, B. (1994). *Identification Guide to the Ant Genera of the World*. Harvard University Press, Cambridge, Massachusetts.
- Folgarait, P. J. (1998). Ant Biodiversity and Its Relationship to Ecosystem Functioning: A Review. *Biodiversity and Conservation* 7:1221–1244.
- Gadagkar, R., Nair, P., and Bhat, D.M. (1993). Ant Species Richness and Diversity in Some Selected Localities in Western Ghats, India.*Hexapoda* 5(2): 79-94.
- Ghait, S.N. and Kale, G.B. (2015). Ant Species Diversity According To Disturbance Gradients in And Around Shegaon, Maharashtra India. *IJSTR*. Volume 4, Issue 11. 62-66.
- Hölldobler, B. and Wilson, E.O. (1990).*The Ants*. Springer Verlag, Berlin, 732 pp.

Lily Leahy , Brett R. Scheffers , Stephen E. Williams and Alan N. Andersen,(2020), ‘Diversity and Distribution of the Dominant Ant Genus *Anonychomyrma* (Hymenoptera: Formicidae) in the Australian Wet Tropics’ *Diversity* 2020, 12, 474; doi:10.3390/d12120474.

Pearson, L.D. and Derr, A.J. (1986). Seasonal Patterns of Lowland Forest Floor Abundance in Southern Peru. *Biotropica*. 18, 244-256.

Tiwari, R.N. (1999). Taxonomic Studies on Ants of Southern India (Insecta : Hymenoptera :Formicidae),*Memoirs*.18 : 1-96.

Underwood E.C and B. L. Fischer (2006). The role of ants in the conservation monitoring: if, when and how. *Biological Conservation* 132: 166-182.





ICHTHYOFAUNAL DIVERSITY OF LANJUD RESERVIOR NEAR KHAMGON IN BULDANA DISTRICT

¹ Kale G. B. and ² Bathe P. N.

¹Head, Department of Zoology, G.S. Science, Arts and Commerce College Khamgaon, Buldana

²Department of Zoology, Bapumiya Sirajoddin Patel Arts, Commerce and Science College, Pimpalgaon Kale Tq. Jalgaon jamod Dist. Buldana.

Abstract: Present research work was carried out to assess the fish diversity and status of Lanjud dam situated on Lendi River near Khamgaon. This fresh water body especially used for drinking, domestic purpose, agriculture and fisheries purposes. Fish samples were collected from Nov 2020 to Dec 2021. The Ichthyofaunal diversity spans through 13 families and 08 orders. Present study is important and helpful for present and future management, conservation and restoration of water bodies, revival of ichthyofaunal diversity and also improves livelihood of fisherman in the rural region.

Index Terms - Ichthyofaunal diversity, Lanjud Dam, Fishery status.

I. INTRODUCTION

India has prosperous variety of fauna and flora due to the presence of rich fresh water habitat and it ranks as one of the world's huge diversity nations. Extremely diverse animals are found in water represent nearly all phyla and documentation of this wide variety of fauna not yet complete in some inaccessible and unexplored ecosystem. Studies on the ichthyofaunal diversity and their conservation in an aquatic ecosystem have always drawn the attention of various fishery researchers (Kar, *et al.*, 2006). Fish diversity is also a good bioindicator of water quality (Madhusudan *et al.*, 2011). Fish play an important role in the economies of many countries as they have been a stabilizing element in many people's diets. It has been notably found that out of the then recorded 27,800 numbers of total valid fish species of the world, 13,000 species are freshwater dwellers particularly inhabiting in lakes and rivers that cover only 1 percent of the earth's surface, while there maiming species, 14,800 numbers live in marine habitats, which cover 70 percent of the total earth's surface (Leveque *et al.*, 2008).

The lack of information on the Ichthyo-fauna is a big handicap for popularizing little known fish variety in a particular ecosystem. Thus, there is need to survey fish fauna associated with habitats, which will help in planning methods for their production and effective exploitation (Renjith kumar *et al.*, 2011). The objectives of the present study are to provide latest data on Ichthyofaunal diversity, in order to increase better knowledge about the diversity of fish and status of Lanjud Reservoir and tools for water conservation in Buldana District. The study is also helpful for creation of wage jobs in rural areas with particular emphasis on fishing communities'

II. STUDY AREA

Lanjud dam is a Medium Irrigation Project constructed on Lendi River, 10kms on Khamgaon-Nandura National Highway No. 6, North-West near Khamgaon, Dist. Buldana (M.S.). It was sanctioned during 1984 and has catchment area of about 66.96sq km. Gross storage capacity of the Dam is 1.9892mcm. It coordinates 76°-36'-00" longitudinally and 20-00'-45" latitudinal. The dam has a total length of 1215m with height of about 12.55m. It was mainly constructed to supply water to MIDC Khamgaon, nearby agriculture and for drinking water to the surrounding villages.

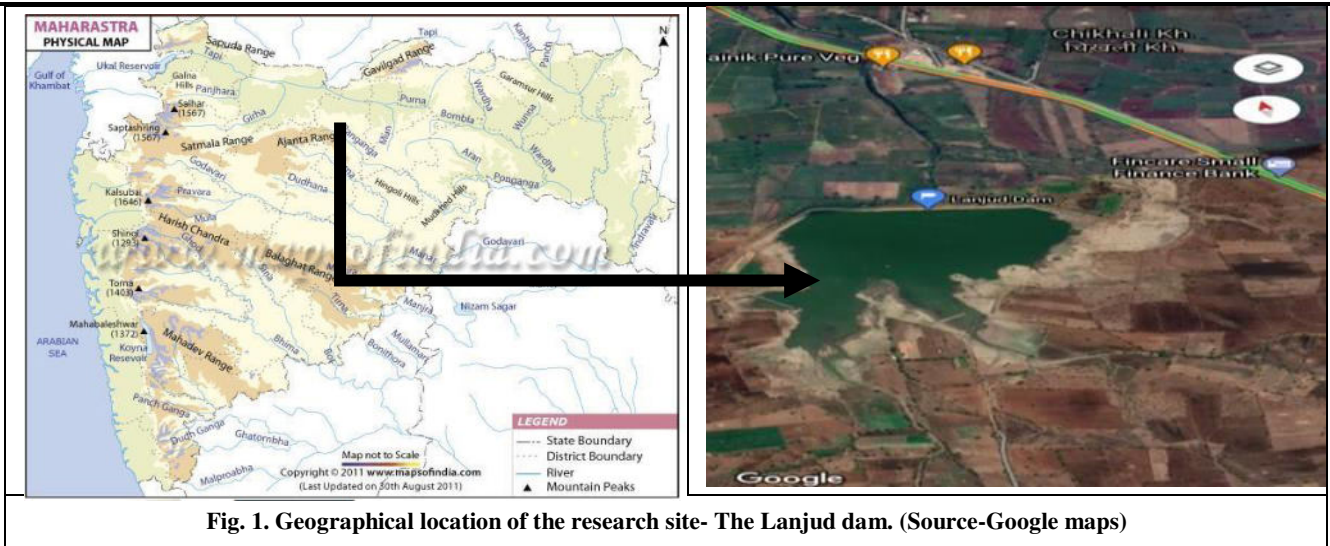


Fig. 1. Geographical location of the research site- The Lanjud dam. (Source-Google maps)

III. MATERIAL AND METHODS

3.1 Collection of Fish samples: Fish samples were collected from Nov 2020 to Dec 2021 and other valuable information were collected from the local fisherman, resident adjacent to the selected sites and Fishing was carried out with the help of local fishers using gill net, cast net, drag net, scoop net including hooks and lines (Bose *et al.*, 2013). The samples were photographed, immediately.

3.2 Preservation: Fishes were collected and directly placed in a wide mouth jar having 2 liter capacity with 8% formalin solution (Bagra, 2010). Separated jar was used for preserving individual species and brought to the laboratory for identification.

3.3 Identification: The samples were identified based on keys for fishes of the Indian subcontinent (Day, 1996; Talwar and Jhingran, 1991) classification were carried out on lines of (Jayaram, 1999). In addition, various morphological characters, shape, colors etc were recorded. The IUCN red list of threatened species was followed to assign the conservation status. The species richness was simply estimated by variety of fish species in 3 different sampling stations.

3.4 Data Collection: To acquire accurate data, questionnaires, group discussion, observation and interview methods were used. Fishing data were collected from fisherman society. Harvesting was statistically analyzed and the annual fishing status of the reservoir was examined. The secondary data were obtained from office document.

IV. RESULT AND DISCUSSION

During the study period it was observed that there were total 31 species. These species were placed in 08 orders and 13 families of class Actinopterygii. Order Cypriniformes was dominant by 17 species, followed by Siluriformes and Perciformes with 04 and 03 species of each. Synbranchiformes and Osteoglossiformes having 02 species of each, while Beloniformes, Cyprinodontiformes, Mugiliformes contribute 01 species each (table 1 and fig 2). The order Cypriniformes showing 55% of total species while Siluriformes and Perciformes having 13% and 10% contribution respectively in total species richness.

Table 4.1: species richness of Lanjud dam reservoir

Sr.No.	Class	Order	Family	Species	Local Name	
1.	Actinopterygii	Cypriniformes	Cyprinida	<i>Labeoninae rohita</i>	Rohu	
2.				<i>Gibelion catla</i>	Catla	
3.				<i>Cirrhinus mrigala</i>	Mrigala	
4.				<i>Ctenopharyngodon idella</i>	Grass carp	
5.				<i>Hypophthalmichthys nobilis</i>	Bighead	
6.				<i>Hypthalmichthys molitrix</i>		
7.				<i>Puntius stigma</i>		
8.				<i>Puntius ticto</i>		
9.				<i>Salmostoma phulo</i>		
10.				<i>Rasbora daniconius</i>	Kajalimasa	
11.				<i>Cyprinus carpio communis</i>		
12.				<i>Osteobrama cotio cotio</i>		
13.				<i>Garralamta</i>		
14.				<i>Catla Catla</i>		
15.				<i>Thynnichthys sandkhol</i>		
16.		Siluriformes	Balitoridae	<i>Nemacheilus botia botia</i>		
17.				<i>Nemacheilus beavani</i>		
18.				<i>Siluridae</i>	<i>Ompok bimaculatus</i>	Papada
19.				<i>Bagridae</i>	<i>Mystus bleekeri</i>	
20.		Synbranchiformes	Mastacembelidae	<i>Schilbeidae</i>	<i>Eutropiichthys goongwaree</i>	
21.				<i>Clariidae</i>	<i>Clarias batrachus</i>	
22.				<i>Mastacembelus armatus (Lacepede)</i>	Bam	
23.		Perciformes	Channidae	<i>Macrogathus pancalus (Hamilton)</i>	Bam	
24.				<i>Channa marulius (Hamilton)</i>	Marai / Dok	
25.				<i>Channa orientalis</i>		
26.		Mugiliformes	Cichlidae	<i>Oreochromis mossambica</i>		
27.				<i>Mugilidae</i>	<i>Rhinomugil Corsula</i>	
28.		Osteoglossiformes	Notopteridae	<i>Notopterus notopterus</i>	Patola	
29.				<i>Chitala chitala</i>		
30.		Beloniformes	Belonidae	<i>Xenento doncancila</i>		
31.		Cyprinodontiformes	Poeciliidae	<i>Poecilia reticulata</i>		



Fig 2: Fish fauna from study area – Lanjud dam



Fig 3: Fish fauna from study area – Lanjud dam



Fig 4: Fish fauna from study area – Lanjud dam

V. CONCLUSION

During the period of investigation 31 fish species belonging to 08 families and 13 orders were recorded. Present study provides a comprehensive data on biodiversity, conservation status of ichthyofauna of this region for the first time. It will be helpful to fisherman society, research students and others too.

VI. ACKNOWLEDGEMENT

The Authors are thankful to department of Zoology, G.S. Science, Arts and Commerce College, Khamgaon, Buldana (M.S.) for their kind cooperation and encouragement during research work.

VII. REFERENCES

- [1] Amrutsagar, M.V. and Lohar, P.S., (2011) Diversity of Mollusca and Fish in Gondoor and Nakane Lakes in Dhulia, Northwest Maharashtra, India. *Journal of Ecobiotechnology*, 3(6)
- [2] Bagra, K. and Das, D.N., (2010) Fish diversity of river siyom of Arunachal Pradesh India: A case Study. *Our nature*, 8(1), pp.164-169.
- [3] Bose, A.K., Jha, B.C., Suresh, V.R., Das, A.K. and Parashar, A., (2013). Fishes of middle stretch of river Tawa, Madhya Pradesh, India. *Journal of Chemical, Biological and Physical Sciences*. 3 (1), pp.706-716.
- [4] Dey, V.K., (1996) Ornamental fishes and Hndbook of Aqua farming. *The Marine Products Export Development Authority, Cochin. Entrepreneurship Development. Central Institute of Freshwater Aquaculture, Bhubaneshwar*, pp.1-6.
- [5] Jayaram, K.C., (1999) The freshwater fishes of the Indian region. Narendra Publishing House, New Delhi, India.
- [6] Kar, D., Nagarathna, A.V., Ramachandra, T.V. and Dey, S.C., (2006) Fish diversity and conservation aspects in an aquatic ecosystem in Northeastern India. *Zoos' print journal*, 21(7), pp.2308-2315.
- [7] Leveque, C., Oberdorff, T., PAUGy, D., Stiassny, M.L.J. and Tedesco, P.A., (2007). Global diversity of fish (Pisces) in freshwater. In *Freshwater animal diversity assessment* (pp. 545-567). Springer, Dordrecht.
- [8] Renjithkumar, C.R., Harikrishnan, M. and Kurup, B.M., (2011) Exploited fisheries resources of the Pampa river, Kerala, India. *Indian Journal of Fisheries*, 58(3), pp.13-22.
- [9] Talwar, P.K. and Jhingran, A.G., (1991) Inland Fishes of India and Adjacent Countries. Vols. 1 & 2: 1-1158. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.

11. Study Report of Road Side Tree Cutting by Mahadiscom in Khamgaon District - Buldana (M.S.)

Kale G. B.

Department of Zoology, G.S. Science, Arts and Commerce College, Khamgaon,
District - Buldana, Maharashtra State- India.

K. B. Sangve

Department of Zoology, Brijlal Biyani Science College, Amravati, Maharashtra State - India.

Ingle Sonal P.

Department of Zoology, G.S. Science, Arts and Commerce College, Khamgaon,
District - Buldana, Maharashtra State - India.

Abstract

Trees are important to the ecosystem for several reasons including human health, pollution, heat reduction, and habitat for several creatures. They are first in tropic level. Numbers of trees were planted by the National Highways Authority of India (NHAI) during state government's ambitious plantation drive along the road side below the overhead electric wires. The Mahadiscom has powers to trim the branches in case if the cause threat to electric wires. Ahead of monsoon, Mahadiscom is trimming and cutting trees under overhead wires as its routine activity. We understand that branches pose a threat to cables and can lead to a breakdown and interrupted power supply.

However, instead of trimming of required branches, Mahadiscom completely cut the trees along road side. Mahadiscom should sensitize their workers to not cut entire trees but only trim the required branches. This is the first attempt to assess the counting of tree cutting in Khamgaon town.

Survey was conducted during the summer, as Mahadiscom cut trees for pre-monsoon preparation. Total 14 Tree species were recorded during this survey that were cut and 1320 cutting trees were recorded from all study sites.

Keywords: Road side Tree cutting, Mahadiscom, Pre-monsoon preparation, Khamgaon.

Introduction

Trees are an important part of every community. Our streets, parks, playgrounds and backyards are lined with trees that create a peaceful, aesthetically pleasing environment. Trees increase our quality of life by bringing natural elements and wildlife habitats into urban settings. We gather under the cool shade they provide during outdoor activities with family and friends. Many neighborhoods are also the home of very old trees that serve as historic landmarks and a great source of town pride.

The Forest Department, in association with the NGOs and voluntary organizations, is planting saplings at vacant spots and road sides as part of tree planting programmes. The planting of saplings are being planted indiscriminately, right under the power lines overhead, which clearly shows the lack of common sense among the officials. Once the saplings grow into trees, the branches will touch the power lines. They can cause a fire, as well as an electrical, hazard to anyone in contact with the tree at ground level. Trees don't have to physically touch an energized power line to be dangerous. Electricity can arc from the power line to nearby trees given the right conditions, such as a voltage surge on the line from a nearby lightning strike. This electric current can kill anyone caught near the tree and can cause a fire.

MAHADISCOM; Maharashtra State Electricity Distribution Company limited; Mahavitaran or Mahadiscom or MSDEDCL is a wholly owned subsidiary of the Maharashtra State Electric board. It is the largest electricity distribution utility in India. The Mahadiscom has powers to trim the branches in case if the cause threat to electric wires. Ahead of monsoon, Mahadiscom is trimming and cutting trees under overhead wires as its routine activity. We understand that branches pose a threat to cables and can lead to a breakdown and interrupted power supply.

However, instead of trimming of required branches, Mahadiscom completely cut the trees along road side. Mahadiscom should sensitize their workers to not cut entire trees but only trim the required branches. This is the first attempt to assess the counting of tree cutting in Khamgaon town.

Now, a day we are witnessing increase in cutting of trees, in our area. This type of unscientific cutting can lead to various hazard to our nature. Some of main reasons for this type of tree cutting are urbanisation, industrialization construction, irrigation project and mahadiscom etc. one of the biggest reason for this type of cutting by Mahadiscom (MSEB).

Thakur J. (2018): Tree felling, garbage dumping, threaten Delhi's Jahanpanah forest. In a report prepared after an inspection in January this year, the department said illegal activities such as felling of trees, dumping of garbage, encroachment and open defecation by locals were rampant.

Observations and Results

A survey was carried out during May 2021 to June 2021 to study the assessment of tree cutting by Mahadiscom in Khamgaon. Total no. of 14 Tree species were recorded during this survey at the study site/research site. (Table 1,2 and 3).

The counting of trees was started from Udasi Baba Mandir as centre point to count the trees in our research area of Khamgaon. Area was divided as South-East region (D.P.Road, Main road, Tower Road, Waman Nagar, Samnaway Nagar, Ram Mandir, Shivaji Nagar, Civil line, Sauji layout, Sati faile, Udasi baba nagar, etc.) recorded with 453 trees, South-West region (Ghatpuri, Narayan colony, Shukla layout, Jhadhav Wali, Chaitain nagar) recorded with 168 trees, North-West region (Anikal road, Shankar Nagar, Gavrav Nagar, Hunuman Nagar) recorded with 228 trees and North-East region (Swami Samarth Sankul, Shikshak colony, Gopal Nagar, Amrut Nagar, Gokul Nagar, Swami Samarath Road, Wali Road, Yeshoda Nagar) with recorded 471 trees.

The Recorded lists represent common species, which were planted almost throughout Khamgaon. Region-wise specific choices can be made with the help of local experts from the Forest department and Horticulture department. As far as possible, fruit bearing trees like, *Azardirachta indica*, *Syzygiumcumini*, *ficus*, *Mangifera indica* and *Tamarindus* were ideal for areas near habitations throughout India. Presented list also comprised flowering plant like *Delonix regia* and *Alstonia scholaris*, also be preferred.

REGIONS	N E M	S H V G A	B A U L	S H I S A M	M A N G O	G U L M O H A R	F I C U S	P E P A L	O T H E R	Total no. of trees cut
South-East	77	27	17	52	31	40	7	5	70	326
South-west	82	28	48	57	13	44	3	5	55	335
North-west	49	8	18	16	2	3	2	5	20	123
North-east	108	38	32	36	6	37	8	8	68	341

Table no. 1

Sr.no.	Name of trees	Full cut trees	Partial cut trees
1.	Azadirachta indica	37	530
2.	Syzygium cumini	4	55
3.	Delonix regia	15	79
4.	Ficus benjamina	22	92
5.	Ficus religiosa	6	41
6.	Alstonia scholaris	18	164
7.	Saraca asoca	9	64
8.	Mangifera indica	4	31
9.	Others	16	136
Total no. of trees		131	1192

Table no.2

The counting of trees was started from Udasi Baba Mandir as centre point to count the trees in our research area of Khamgaon. Area was divided as South-East region recorded with 453 trees. South-West region recorded with 168 trees. North-West region recorded with 228 trees. North-East region with recorded 471 trees.

In South-East Region total cutted trees are 453 in which neem trees are 186, Jamun trees are 18, Gulmohar trees are 23, Ficus trees are 52, Peepal trees are 12, Saptarni trees are 53, Ashoka trees are 26, Mango trees are 12 and unidentified species of trees are 71.

In South-West Region total cutted trees are 168 in which neem trees are 62, Jamun trees are 7, Gulmohar trees are 25, Ficus trees are 17, Peepal trees are 7, Saptarni trees are 9, Ashoka trees are 15, Mango trees are 5 and unidentified species of trees are 21.

In North-West Region total cutted trees are 228 in which neem trees are 106, Jamun trees are 15, Gulmohar trees are 19, Ficus trees are 21, Peepal trees are 8, Saptarni trees are 33, Ashoka trees are 16, Mango trees are 7 and unidentified species of trees are 3.

In North-East Region total cutted trees are 471 in which neem trees are 213, Jamun trees are 19, Gulmohar trees are 27, Ficus trees are 24, Peepal trees are 20, Saptarni trees are 87, Ashoka trees are 19, Mango trees are 11 and unidentified species of trees are 51.

In all regions i.e South-East, South-West, North-West, North-East the total no. of neem cited trees are 567, Jamun trees are 59, Gulmohar trees are 94, Ficus trees are 114, Peepal trees are 47, Saptarni trees are 182, Ashoka trees are 73, Mango trees are 35, unidentified species of trees are 152.

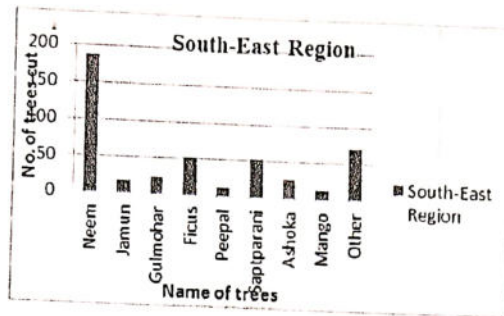


Fig.2. South-East region

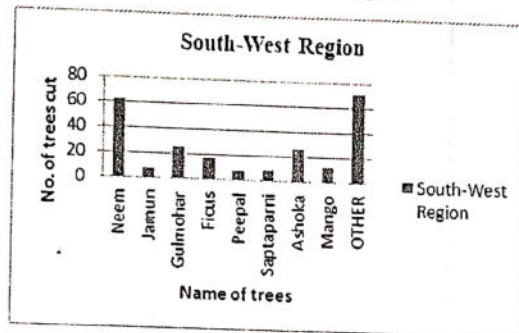


Fig. 3. South-West region

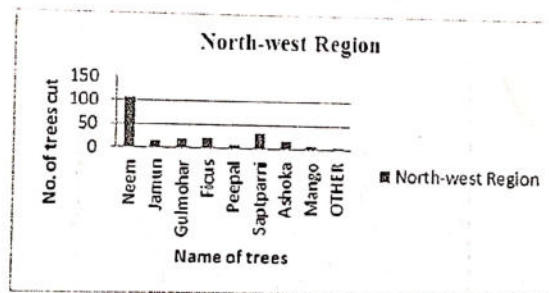


Fig.4. North-West region

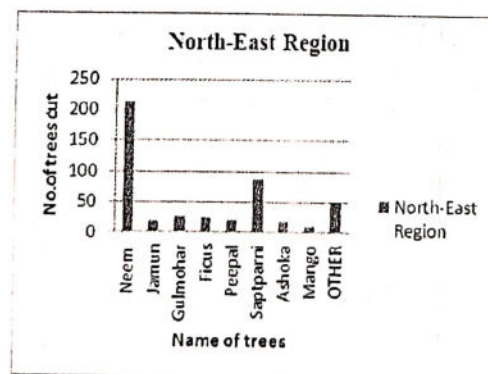


Fig.5. North-East region

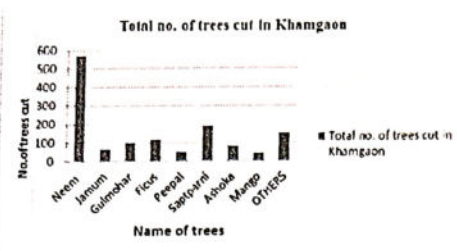


Fig.6. Total no. trees cut in Khamgaon

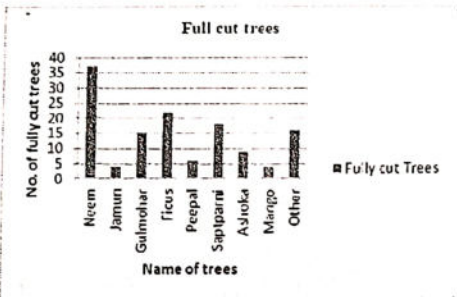


Fig no.7 Total no. full cut trees

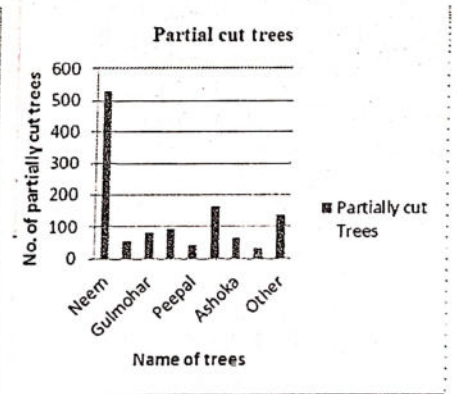


Fig no.8. Total no. partial cut trees

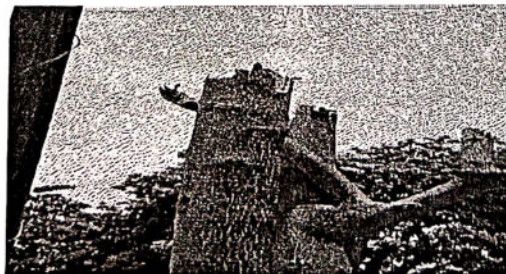


Plate No.1. Photographs of tree cutting by Mahadiscom during 2020-2021 as premonsoon preparation.



Plate No.2. Photographs of tree cutting by Mahadiscom during 2020-2021 as premonsoon preparation.

Discussion

The present research entitled assessment of tree cutting by mahadiscom [Maharashtra state electricity distribution company] as premonsoon preparation was conducted on research field of in khamgaon , Dist. Buldhana. The survey was carried in Premonsoon, period i.e from 15th May 2021 to 15th June 2021. During this survey a total of 14 tree species which are either cut or trimmed were recorded.

Total count of trees from area of Khamgaon was recorded with 1320 trees. Area of khamgaon was divided in 4 parts. East - south region recorded with 453 trees, south - west region recorded with 168 trees, north - west region recorded with 228 trees and north - east region recorded with 471 trees.

The Effects of Cutting down Trees on the Ecosystem

Cutting down trees is necessary to produce wood for construction, paper and other applications, but logging and other activities that kill trees can potentially lead to negative impacts on ecosystems and the environment as a whole large scale tree cutting can lead to deforestation, a transformation of an area from forest to terrain with little vegetation. Plants create oxygen and absorb greenhouse gases. The destruction of trees may, therefore, encourage global warming. Changing temperatures can alter which organisms can survive in an ecosystem. Cutting trees can result in the loss of habitat for animal species, which can harm ecosystems. According to National Geographic, 70 percent of Earth's land animals and plants live in forests, and many cannot survive the deforestation that destroys their homes."

For long economic development strategies adopted in countries have served to perpetuate a habit of harvesting the forest for immediate needs without any due regard for its long-term sustainability (Winter bottom and Hazelwood, 1987; Caufield, 1986).

Species richness of many taxa often declines along the gradient, with the lowest richness to be found in the urban core. Urban planners should find ways to preserve biodiversity as cities expand outward and subsequently modify natural habitat. Such efforts would most likely focus on preserving as much remnant natural habitat as possible, as opposed to most current land development techniques, which remove most natural vegetation during construction. (Mckinney M., 2015)

Conclusion

From this survey it may be noted that the Khamgaon town represents species diversity with varies scientifically, culturally and economically important species. Apart from beautification, these species are supportive to local people and other fauna like birds, insects, and microbes etc.

This study concluded to compute improved estimates for biomass, and there from biomass carbon in forests taking into account the inventory data for diversified forest types present in the country, and also by accounting for biomass in other vegetation on forest floor.

It also revealed that purpose of this study is to compute improved estimates for biomass, and there from biomass carbon in forests taking into account the inventory data for diversified forest types present in the country, and also by accounting for biomass in other vegetation on forest floor.

As the world facing unprecedented loss of biological diversity, conservation of plant diversity in any locality assumes great important.

References

- **Behl M.(2021):** MSEDCL cuts trees under power lines instead of trimming branches. (timesofindia.indiatimes.com/city/nagpur/msedcl-cuts-trees-under-power-lines-instead-of-trimming-branches/articleshow/82487659)
- **Chatterjee B. (2019):** 13.4L trees cut for development in Maharashtra since 2015: Greenministry. (hindustantimes.com/mumbai-news/13-4l-trees-cut-development-in-maharashtra-since-2015-green-ministry/story).

- **EPR Editorial Magazine (2020):** Nashik: MSEDCL begins pruning trees across city to avoid power cuts during monsoon (epmagazine.com/news/nashik-msedcl-begins-pruning-trees-across-city-to-avoid-power-cuts-during-monsoon/)
- **Gagan S. (2021):** Maharashtra to amend Act to protect trees, prevent excess felling, (hindustantimes.com/cities/mumbai-news/maharashtra-to-amend-act-to-protect-trees-prevent-excess-felling-101623353360299)
- **Indiatoday (2019):** Aarey forest protests: High political drama as 1,500 trees axed in one day, 29 people arrested. (indiatoday.in/india/story/aarey-forest-protests-high-political-drama-as-1-500-trees-axed-in-one-day-29-people-arrested-10-points-1606591-2019-10-06)
- **Ministry of transport department of surface transport (roads wing) (1986):** Ministry's Technical Circulars And Directives on National Highways and Centrally Sponsored Road And Bridge Projects Volume I Published By The Indian Roads Congress On Behalf Of The Govt Of India, Ministry Of Transport Department Of Surface Transport (Roads Wing).
- **Nanisett S. (2019):** Highway expansion clearing roadside tree. (thehindu.com/news/cities/Hyderabad/highway-expansion-clearing-roadside-trees/article27105451)
- **PillaiS.(2020) :** Sarvodaya Enclave loses 77 trees in 7 years. (hindustantimes.com/delhi-news/sarvodaya-enclave-loses-77-trees-in-7-years/story)
- **Thakur J. (2019):** Tree felling, garbage dumping, threaten Delhi's Jahanpanah forest. (hindustantimes.com/delhi-news/tree-felling-garbage-dumping-threaten-delhi-s-jahanpanah-forest/story-b47hd0U0S767C32KB111UJ)

Materials and Methods

Khamgaon is a city in Buldhana District, Maharashtra, India. It is the largest town in buldhana district. Khamgaon city is also called as 'silver town' with the population approaching to 100,000 people, located in northern Maharashtra India. It is well connected to all other big cities of India as well as Maharashtra with a National Highway 6. Khamgaon, Maharashtra, India latitude and longitude coordinates are; 20.711622, 76.566132.

The district has 9661 Sq.km geographical area with total forest Area of 1165 Sq.km is under the forest department. The forest area makes 16.41% of the total geographical area as against the average of 17.56 % for the State of Maharashtra. This area coordinates between Longitude 20034'07"N and Latitude 76023'21"E. This is situated 50 km from Buldana. There are two lakes Januna and Lanjud. The forest subtype is of Group 5 Southern Tropical Dry Deciduous type is reported by Champion and Seth (Champion H, and Seth S.K.; 1968). These forests are dominated by deciduous trees, with almost 90-95% of leaf drop during the dry season.

Data collection was conducted by taking account of cutting of trees and alive trees in the area of Khamgaon. Udasi Baba Mandir was taken as centre point to count the trees in our research. Area of Khamgaon was divided as South-East region (D.P.Road, Main road, Tower Road, Waman Nagar, Samnaway Nagar, Ram Mandir, Shivaji Nagar, Civil line, Sauji layout, Sati faile, Udasi baba nagar, etc.) , South-West region (Ghatpuri, narayan colony, shukla layout, Jhadhav Wali, Chaitain nagar), North-West region (Anikal road, Shankar Nagar, Gavrav Nagar, Hunuman Nagar.) and North-East region(Swami Samarth Sankul, Shikshak colony, Gopal Nagar, Amrut Nagar, Gokul Nagar, Swami Samarth Road, Wali Road, Yeshoda Nagar.) with the centre point as Udasi Baba Mandir, Saoji layout, Khamgaon.

Data was collected keeping spot notes. To collect the information, materials used were Camera, data sheet, measuring scale. Images were captured using mobile camera in the form of photographic images. Therefore, the data collection and survey was made by this method.

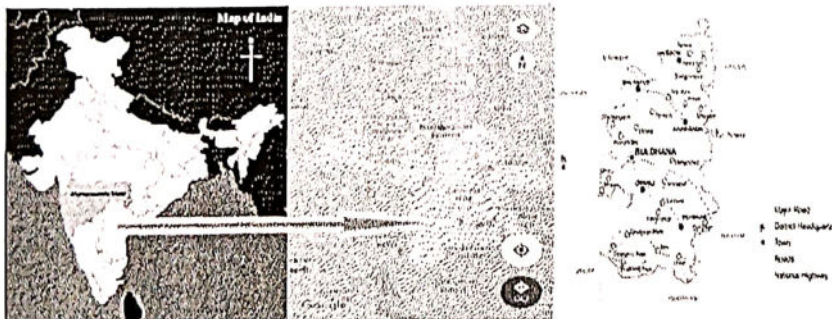


Fig A. Geographical Location of the Study Area

Reviews of Literature

Anuradha M. (2016): Maharashtra: MSEDCL makes a maintenance checklist ahead of monsoon. Work is Pre monsoon maintenance activity underway on distribution panel (DP) boxes, feeders, transformers, tree branch cutting and replacement of cables and oil change,” said Neelkanth Raut. Behl M. (2021): MSEDCL cuts trees under power lines instead of trimming branches. Chatterjee B. (2019): 13.4L trees cut for development in Maharashtra since 2015: Green ministry .The state and Central governments approved the felling of 13,42,703 trees for various development projects across forest areas over, from 2015 to 2019. Data from the state showed the same amount of trees had been lost from Maharashtra forests between 2005 and 2013 for development projects. EPR Magazine Editorial (2020): MSEDCL begins pruning trees across city to avoid power cuts during monsoon. The Maharashtra State Electricity Distribution Company Limited (MSEDCL) has started pruning trees under the overhead electricity lines in the city as part of their pre-monsoon activity. Express News Service (2011): „Monsoon: MSEDCL sets up disaster management cells Ahead of the monsoon, the Maharashtra State Electricity Distribution Co. Ltd has set up disaster management cells at its control rooms in the city and rural areas to avoid any disruption of power owing to rains. Fernandes F. (2011): Cops book two MSEDCL officers for trimming trees without permission. The Maharashtra State Electricity Distribution Company Ltd's Ghodbunder divisional employees extensively trimmed over 125 trees along the lower-voltage distribution lines that provide electricity to neighborhoods.

Gary A. et al, (2018): invented the new idea to stop the deforestation of Philippines house/ forest. Every student planted the 10 trees each before graduation. Government of Maharashtra (2017): in its corrigendum no. DIPP/TFTP/CR NO.21/F-6 suggested ease of doing business- guidelines for tree felling and transit permission. George J. S. Dei (1993): Reported on tree cutting in rural Ghana. Government of India (2015): in its policy decision regarding plantation, transplantation, beautification, and maintenance suggested-To develop eco-friendly National Highways with participation of the community, farmers, NGOs, private sector, institutions, government agencies and the Forest Department for economic growth and development in a sustainable manner. Gadkari S. (2017): Maharashtra; New trees protection and preservation act makes hacking up to 25 trees easy.