

3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication	ISBN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
2017-2018										
1	Malan Zardi	An International Multidisciplinary Quarterly Research journal	Mergers of Banks: Needs, Issues and Challenges	NA	Merger of Public Sector Banks in India: Problems and Prospects	International	Jan- March 2018	2277-5730	Rizvi College of Arts, Science and Commerce	Ajanta Praksahan
2	Dr. Shadab Syed	Taryaq Urdu Research journal	Special issue 'Shanakht'	NA	NA	International	2017	2395-5686	Rizvi College of Arts, Science and Commerce	Urdu Foundation
3	Dr. Abhay Ranade	Applied Physics V-III	1. Cell Structure 2. Transport Process 3. Measurement Techniques 4. Environmental Geomagnetism. 5. Anthropogenic Activities.	NA	NA	National	2018	978-93-5149-9978-93	Rizvi College of Arts, Science and Commerce	Sheth
4	Dr. Abhay Ranade	A new Course in Physics. V-I	1. Fresnel Diffraction 2. Fraunhofer Diffraction 3. Polarisation-I,II 4. Second Law of Thermodynamics. 5. Entropy 6. Third law of Thermodynamics 7. The Third Law of Thermodynamics.	NA	NA		2018	978-93-5149-843-8	Rizvi College of Arts, Science and Commerce	Sheth
5	Dr. Abhay Ranade	A new Course in Physics. V-II	1. Calculus-I, 2. Calculus-II	NA	NA		2018	987-93-5149-855-1	Rizvi College of Arts, Science and Commerce	Sheth
6	Dr. Ashfaq Khan	NA	Study of Prophetic Medicines in Some Common Foods pg 39 as second Author	Advances in Biological Sciences	One Day National Conference	National	3rd Feb 2018	978-81-933546-5-0	Rizvi College of Arts, Science and Commerce	Rizvi College A/S/C
7	Mr. Vishwas V. Deshmukh	Applied Physics-I Sem-II	1. Acoustics of Building 2. Laser and 3. Fibre optics	NA	NA	State level	2017	978-93-5273-511-2	Rizvi College of Arts, Science and Commerce	Himalaya
8	Mr. Vishwas V. Deshmukh	Applied Physics-II Sem-IV	1. Basic of Modulation 2. Amplitude and frequency Modulation	NA	NA	State level	2018	978-93-5299-068-9	Rizvi College of Arts, Science and Commerce	Himalaya Publishing House

9	Zaidi Zari Haider	.Net Technologies	—	NA	NA	National	2018	978-93-5273-968-4	Rizvi College of Arts, Science and Commerce	Himalaya Pulishing House
10	Khan Moharram Ali	Applied Physics-I Sem-III	Proof reading and editing	NA	NA	State level	2017	978-93-5273-511-2	Rizvi College of Arts, Science and Commerce	Himalaya Pulishing House
11	Khan Moharram Ali	Applied Physics-II Sem-IV	Proof reading and correction	NA	NA	State level	2018	978-93-5299-068-9	Rizvi College of Arts, Science and Commerce	Himalaya Pulishing House
12	Dr. Ashfaq Khan	IJR - Blind Peer reviewed Bi- annual Journal Vol 7 (1) Jul - Dec 2017	Chief Executive of Journal	NA	NA	National	2017	2231-6124 UGC Listed	Rizvi College of Arts, Science and Commerce	Rizvi College A/S/C
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13	Khan Moharram Ali	COLLEGE PHYSICS II	1. The Schrodinger Wave Equation, 2. Appl. of Schrodinger Steady State Equation-I, 3. Appl. of Schrodinger Steady State Equation-II	NA	NA	State level	2018-19	978-93-5299-665-0	Rizvi College of Arts, Science and Commerce	Himalaya Pulishing House
14	Nitesh Joshi and Ambika Joshi.	Green Spaces : create your own.	NA	NA	NA	international	2018	ISBN:978-1-64429-	Rizvi College of Arts, Science and Commerce	Notion Press
15	Alkama G. Faqih, Nitesh C. Joshi and Ambika N. Joshi	environment: problems, mitigation practices and education.	Phytomonitoring and Phytoremediation of Dust pollution in Mumbai	NA	NA	international	2019	ISSN NO:9783659812187.	Rizvi College of Arts, Science and Commerce	LAMBAR T Academic Publishing
16	Rafat khan	“Game Programming” of T.Y.B.Sc.C.S . Semester 5	NA	NA	NA	National	2019	978-93-89251-54-7	Rizvi College of Arts, Science and Commerce	University of Mumbai
17	Rafat khan	“Free and Open Source Software” of F.Y.B.Sc.C.S . Semester 1	NA	NA	NA	National	2019	978-81-941545-1-8	Rizvi College of Arts, Science and Commerce	University of Mumbai
18	Zaidi Zari Haider	ADVANCED WEB PROGRAMMIN	NA	NA	NA	National	2019	978-93-5367-482-3	Rizvi College of Arts, Science and Commerce	Himalaya Pulishing House
2019-2020										
19	CA Ashfaque Karim	The Human Resource Management Policies Outlined by Imam Ali(as)	NA	NA	NA	International	2019	9.78E+12	Rizvi College of Arts, Science and Commerce	Amazon

20	Dr.Nitesh Joshi	Sustainable Agriculture In The Era OfClimateChangeeditors: Roychowdhury,R., Choudhury, S., Hasanuzzaman, M., Srivastava, S. (Eds.) ARTICLE	Phytomonitoring And Mitigation Of Air Pollution By Plants	NA	NA	International	2020	ISBN 978-3-030-45669-6	Rizvi College of Arts,Science and Commerce	SPRINGER NATURE
21	Dr.Paul Raj	Economic and Social Issues of Call Centre	Full Book	NA	NA	National	2020	ISBN No. 978-1-67815-735-7	Rizvi College of Arts,Science and Commerce	Amitesh Publishers & Company
22	Dr.Paul Raj	Employees in India: A case of Mumbai City	Full Book	NA	NA	National	2020	ISBN No. 978-1-67815-735-7	Rizvi College of Arts,Science and Commerce	Amitesh Publishers & Company
23	Dr. Mariyah Gour-Ghori	Journalism Studies: An Overview	NA	NA	NA	National	2020	September 2021, Print - 1, ISBN-978-93-91735-96-8	Rizvi College of Arts,Science and Commerce	University of Mumbai Press
24	Dr. Mariyah Gour-Ghori	Ethics in Journalism	NA	NA	NA	National	2020	September 2021, Print - 1, ISBN-978-93-91735-96-8	Rizvi College of Arts,Science and Commerce	University of Mumbai Press
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29		Microeconomics:FYBA Semester II	NA	NA	NA		2020	ISBN-978-93-89756-12-8		
30		Public Finance: SYBA Semester III	NA	NA	NA		2020	ISBN-978-93-89803-09-9		
31		Microeconomics:TYBA Semester V	NA	NA	NA		2019	ISBN-978-93-91066-46-8		
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34	Dr. Ashfaq Khan	Aarhant Multidisciplinary International Education Research Journal	Non Fictional and sacred ways to manage life skills laid down 1450 years ago by untutored Prophet	NA	NA	International	Vol 38, No 07 : 2021	ISSN 2278-5655	Rizvi College of Arts, Science and Commerce	Multidisciplinary Scholarly Research Association, India & Aarhat Publication and Aarhat Journals
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Merger of Banks: Needs, Issues and Challenges

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Abstract

In the year 1993, the government took a drastic stride towards economic affluence and took a step towards merger of banks. The New Bank of India was merged with the Punjab National Bank (PNB). This was the first merger between nationalized banks, ever witnessed in Indian history. SBI first merged State Bank of Saurashtra with itself in 2008. Later in 2010, State Bank of Indore was merged with it. Recently all five associate banks of State Bank of India (SBI) and Mahila Bank are merged with State Bank of India and SBI started functioning as unified entity. It is the largest ever consolidation exercise in the Indian banking industry. So, this paper try to analyze the issues and challenges related merger of banks in Indian context.

Keywords: Public sector banks, Mergers, issues, challenges, needs, Bank consolidation

Introduction

The various committees appointed by the Government of India have advocated consolidation They argue that we need to have three to four large nationalized banks in order to improve the operational efficiency and distribution efficiency. The Narsimhan committee has specifically emphasized the need to have Indian Banks which are comparable in size with global leading banks.

The Narsimhan committee proposed a three-tier banking structure in India with around 3-4 large banks to take a stand in global scenario, 8-10 banks to provide national coverage and rest to take care of local coverage.

Most of the mergers in the pre-reform period have been forced ones. The post-reform era has witnessed both forced and voluntary mergers. The forced mergers have been caused by the financial ill health of the acquired banks. Banks witnessing erosion in net worth, huge NPAs and decline in capital adequacy ratio have been forced by the regulatory authority to undergo merger. Oriental Bank of Commerce's acquisition of Global Trust Bank is an example of forced merger. Voluntary mergers have expansion, diversification and growth as the main motives. HDFC's acquisition of Times Bank and ICICI's acquisition of Madura Bank are a few examples of voluntary mergers. India has also witnessed cross- border acquisitions in the recent past. SBI's

acquisition of a Mauritian bank is one such example. The Finance Ministry has asked four large PSU creditors to explore opportunities for acquisition of small and mid-sized banks with a goal to create global sized lenders.

Objectives

1. To study the needs for bank consolidation
2. To examine the issues and challenges of merger of banks

Research methodology

This research paper is based on secondary data. The sources of these data have taken from research journals, newspaper, websites, and books. This research paper tries to analyse the issues and challenges of merger of banks with the help of assembled data.

Need for bank consolidation

Bank consolidation occurs when two or more banks become one bank. Bank consolidation can lead to expansion for the newly merged institution. Banks consolidate for multiple reasons, including to mitigate competition, gain capital power both domestically and internationally, to compete with larger banking institutions or to expand the services that the newly merged bank can provide both internally and geographically by decreasing overall operating costs.

Indian Banks are too small: Even as India is the second largest growth market for banking services after China in terms of the number of wealthy households, the ASSOCHAM Chief said, only two Indian banks, State Bank of India at the 64th position and ICICI Bank Ltd at 81st, figure among the global top 100 by tier I capital – a core measure of a bank's financial strength that consists largely of shareholders' capital.

Similarly, in terms of assets, India's largest bank, SBI is now the world's 70th largest bank. On the other hand, ICICI Bank Ltd, the largest private sector lender has attained the 148th position. None of the other Indian banks features among the top 200 banks in the world in terms of size of assets.

Many experts in Banking field feels that hampered by the fragmented nature of the banking industry, Indian banks are not able to compete globally in terms of fund mobilization, credit disbursal, investment and rendering of financial services. The balance sheets of top 10 Indian banks suggest the greater scope of consolidation to reap the benefits of large sized globally competitive Indian banks.

Large public sector banks (PSBs) like Punjab National Bank, Bank of Baroda, Canara Bank and Bank of India could try looking for potential contenders for acquisition.

The Indian government in February had decided the merger of these five associate banks with SBI. State Bank of Bikaner and Jaipur, State Bank of Hyderabad, State Bank of Mysore, State Bank of Patiala and State Bank of Travancore were merged with SBI, tossing the country's largest creditor to among the league of top 50 banks in the world. Later in April 1, 2017 the cabinet further approved merger of BMB as well. The combined entity will have network of over 24000 branches with ATM serving 50 crore customers.

Merger will increase Capital efficiency: Consolidation will also increase capital efficiency. Merged entity will have more leg room to raise capital.

Would decrease NPA: At a time when NPAs are high, and banks are putting more effort in recovery, the ability to recover by smaller number of banks will be higher though an individual bank's exposure may go up. This is because there are smaller number of voices ... in the joint lenders' forum today there are too many voices and each lender has a differential right with the borrower and they often not agree to a common recovery programme. With consolidation the recovery will be far more focused. Thus consolidation could decrease NPA in India.

Issues related to merger of Banks

The weaknesses of the small banks may get transferred to the bigger bank also. The amalgamation of Global Trust Bank with Oriental Bank of Commerce in 2004 is a case in point.

Mergers will result in shifting/closure of many ATMs, Branches and controlling offices, as it is not prudent and economical to keep so many banks concentrated in several pockets, notably in urban and metropolitan centers. Though the closure or merger of a large number of branches will not happen all of a sudden, it is bound to happen over a period of next 5 years. Mergers will result in immediate job losses on account of large number of people taking VRS on one side and slow down or stoppage of further recruitment on the other. This will worsen the unemployment situation further and may create law and order problems and social disturbances. The plight of people taking pre-mature retirement (through VRS route or otherwise) will turn more pitiable than being envisaged.

Financial inclusion plans may be affected and their deadline for their implementation may be delayed. 'Direct Benefit Transfer' (DBT) of government aid, subsidies and grants also will be affected.

The bank accounts linked to ECS and demat records are to be changed. This is a laborious, time taking and expensive exercise. Since the number of bank branches will be large, managing them may pose greater challenges. It is estimated that each bank will have not less than 8,000 branches, after merger. Experts argue that consolidation should take place in a

positive environment. The present process of consolidation is not driven by the inherent strength of the banking system. It is resorted to escape from the problem of NPAs.

Presently these banks have huge NPAs thus merger should be planned after sufficient capital is injected. Banking competition may be affected, as SBI is likely to be five times larger than its nearest competitor. RBI has declared SBI as Domestic Systemically Important Bank (DSIBs) and its failure can shock other parts of financial system. Past example of large banks and their failure with financial crisis in Japan, USA, etc.

Workers resistance from associations like AIBEA calling for strike. India has poor financial inclusion, thus needs variety of banks and differentiated services.

Challenges of Bank Mergers

The biggest challenge of much talked about mergers of banks is the implication of consolidation on employment, profitability, market share, human motivation and technology. Since the merger exercise is in its infancy stage in India, the past experience of post-merger implications on economy can be taken into considerations to devise and monitor of merger. Employees or most affected party of mergers. The UNI Europe Report estimated that 1, 30,000 jobs have been lost in the last 10 years as a result of mergers and acquisitions.

The merger and resultant big entity possesses its unique set of challenges. The scale of the task is substantial given the total staff strength. It will pose a huge test in terms of integration of roles, salary, and perquisite and pension structures and, no less importantly, work cultures.

Much of the opposition from the bank unions stems from concerns relating to these issues. For example prospects of promotion may be hampered due to curtailment of seniority or rationalization of branches due to overlap may lead to their relocation.

Customers of the smaller, community or regional market-focused subsidiaries such as the State Bank of Travancore may be discomfited by having to deal with a larger, more impersonal lender, one where the size of their accounts may be viewed as comparatively marginal.

For regulators, the new entity will throw up interesting oversight issues. The size of new entity possesses huge challenge for regulators.

Conclusion

Government is aiming to reduce the number of state-owned lenders and improving their financial health. In this background proposed merger will benefit to not only to bank but also to economy as whole. Similarly the Bank Board Bureau has been tasked with

overseeing a restructuring among other public sector banks to speed of the long delayed process.

Bank consolidation is a tricky issue. While it is said that the long-term benefits of consolidation outweigh the short-term concerns, it must not be made a general policy. It is only to be done with right banks for right purpose with proper safeguards. Capital and Consolidation are three dimensions in the new banking regime which is imminent in India. With the introduction of financial service convergence and competitions from outside and within, it is quite justifiable that to bring a sound transparent, efficient, and effective and culture friendly banking practices should be on the anvil of the government as well as policy makers. The post-merger implications of bank on customers, society, culture, stakeholders, employees, productivity, profitability and technology in Indian context are still debatable and researchable issue.

References

- Abdul Kalam A.P.J, Multidimensions of Banking, inaugural address in banker's conference 2004 (Bancon 2004) hosted by PNB with the organizational support of Indian Banks' on 10 -11 Nov 2004 New Delhi
- Banu, Hasan S, The impact of Mergers and Acquisitions on the Stakeholders of Banking Sectors, pp 80- 85, IBA Bulletin Special Issue, Jan 2005 Prowess CMIE Database
- Chidambaram P., Indian Banking Realising Global Aspirations, a special address in banker's conference 2004(Bancon 2004) hosted by PNB with the organizational support of Indian Banks' on 10 -11 Nov 2004 New Delhi
- Karunagaran A., Towards Universal Banking in India: Some Regulatory and Supervisory Issues, a paper presented in banker's conference 2004
- Talwar, S.P., Competition, consolidation and systematic stability in the Indian banking industry pp 75-79, BIS paper no 4.
- Udeshi, Kishori J, Bank Supervision – Challenges Ahead, NA Palkhivala Memorial Oration Lecture by Deputy Governor of the RBI, Jaipur, 28 August 2004
- www.google.com
- www.rbi.org.in

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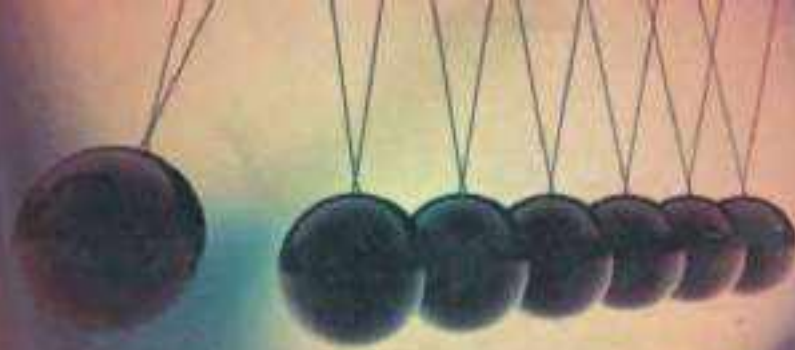
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Applied Physics

S.Y. B.Sc. Semester - III & IV

(Volume-III)


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PREFACE

We are happy to present this book written in accordance with the Second Year B.Sc. Physics syllabus of Mumbai University revised in the year 2017. It includes Acoustics, Laser Physics, Biophysics, Material Science, Geophysics, Micro Processor, Radiation Physics and Radio Communication.

We, the authors, were free to choose the style and method of presentation which seemed appropriate to us for the subject. For better understanding of the subject matter, a number of solved problems, multiple choice questions and applications have been included.

In spite of all the care taken, some errors and obscurities can always creep in while writing a book and they must be rectified in the interest of the readers, particularly the students. We would highly appreciate if they are brought to our notice whenever spotted, so that we can make the corrections wherever needed. For quick response to any queries, we may be contacted directly at the following addresses :

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(VOLUME - III)

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(Volume-I)

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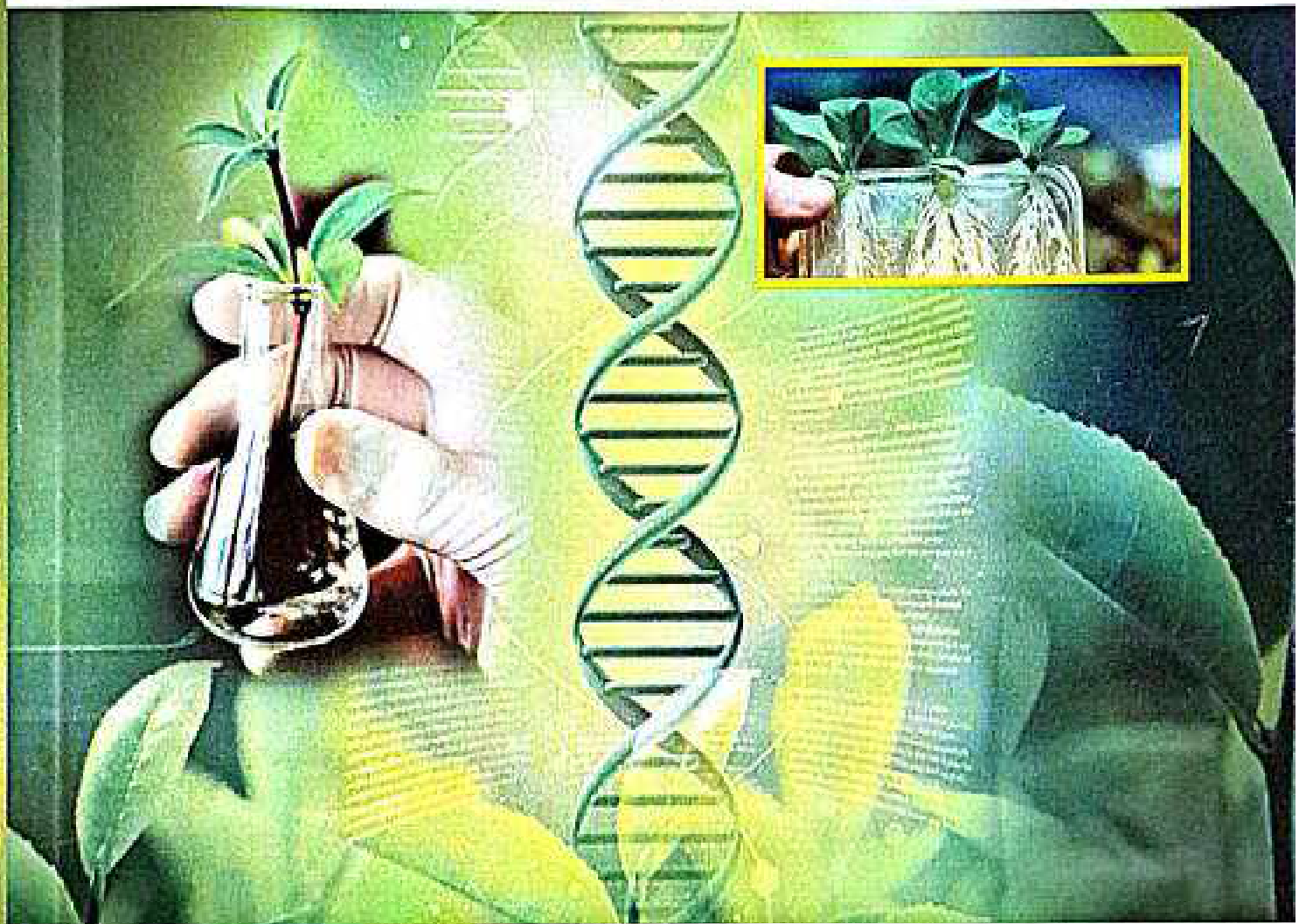
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One Day National Conference

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On

3rd February, 2018



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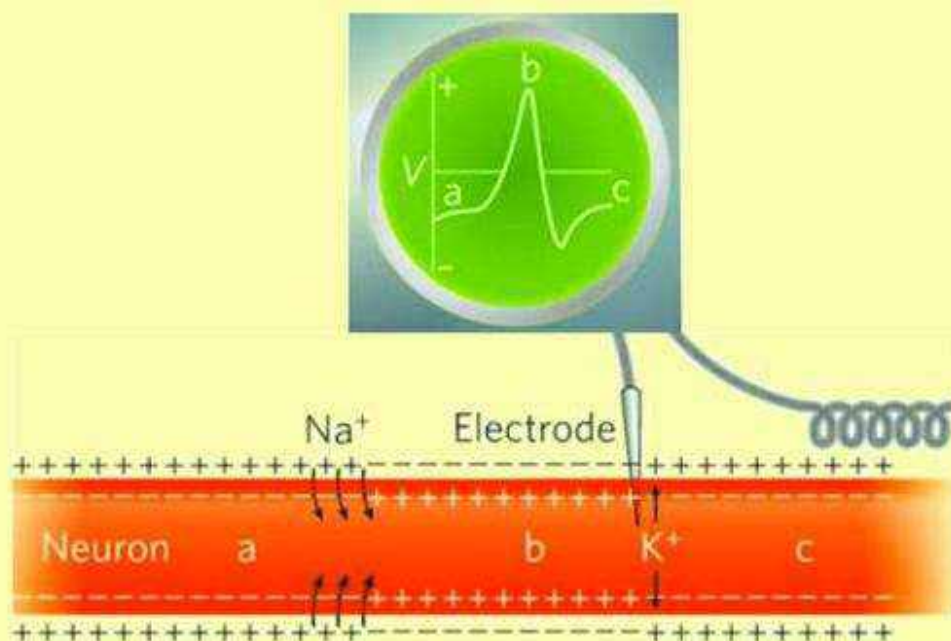
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SYLLABUS

USPH303 : Applied Physics - I

This paper consists of three modules (units) designed in a way so as to offer interdisciplinary and application oriented learning.

Learning Outcomes: On completion of this, it is expected that:

- (i) Students will be exposed to contextual real life situations.
- (ii) Students will appreciate the role of Physics in interdisciplinary areas related to materials, Bio Physics, Acoustics etc.
- (iii) The learner will understand the scope of the subject in Industry and Research.
- (iv) Experimental learning opportunities will foster creative thinking and a spirit of inquiry.

Unit I: Acoustics, Lasers and Fibre Optics (15 Lectures)

- (1) **Acoustics of Buildings:** Reverberation, Sabine's formula (without derivation) Absorption coefficient, Acoustics of Buildings, factors affecting Acoustics of Buildings, Sound distribution in an auditorium.
- (2) **Laser:** Introduction, Transition between Atomic Energy States (without derivation), Principle of Laser, Properties of Laser, Helium-Neon Laser, Application of Laser, Holography.
- (3) **Fibre Optics:** Light propagation through Fibres, Fibre Geometry, Internal reflection, Numerical Aperture, Step-Index and Graded-Index Fibres, Applications of Fibres.

Unit II: Biophysics (15 Lectures)

Introduction, definition, History and scope of biophysics, biological fluids, physico-chemical properties, viscosity, surface tension, pH, osmosis, osmotic pressure. Diffusion, Ficks' laws of diffusion, dialysis, Cell is unit of life, fundamental understanding prokaryotic and eukaryotic cell structure and function, eukaryotic cell membrane, Fundamentals of transport process through biological membrane, membrane channels. electrical properties of cell, Action potential, propagation of action potential, methods of measurement of action potential, Nernst equation, Goldman equation, The Hodgkin-Huxely model of action potential, voltage clamp technique, Patch clamp technique, cell impedance and capacitance.

Unit III: Materials – Properties and Applications (15 Lectures)

Introduction to Materials

Classification of Materials based on structures (Crystalline and Amorphous, single crystal, polycrystalline and nanomaterials) and Functionality (Conducting, insulating, superconducting, reflecting, transmitting etc.)

Types of Materials: Metals and alloys, Ceramics, Polymers and Composites, Thin Films, Nanomaterials; Some Physical and Chemical methods of materials synthesis. **(5 L)**

Properties of Materials

Electrical Properties: Review of energy band diagram for materials - conductors, semiconductors and insulators, Electrical conductivity in metals, semiconductors and insulators (dielectrics), effect of temperature on conductivity.

Optical Properties: Reflection, refraction, absorption and transmission of electromagnetic radiation in solids.

Magnetic Properties: Origin of magnetism in solids (basic idea), Types of magnetic order (paramagnetism, diamagnetism, antiferro magnetism, ferromagnetism, ferrimagnetism), magnetic hysteresis. **(6 L)**

Applications

Optical Materials: LEDs, OLEDs, LCDs, Flat Panel Displays, Optical Fibers.

Dielectric Materials: Piezoelectric, Ferroelectric and Pyroelectric Materials.

Magnetic Materials: Soft Magnets (Transformer steels), Hard Magnets for Permanent Magnets, Magnetic Recording and Storage. **(4 L)**

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APPLIED PHYSICS - II

S.Y. B.Sc.

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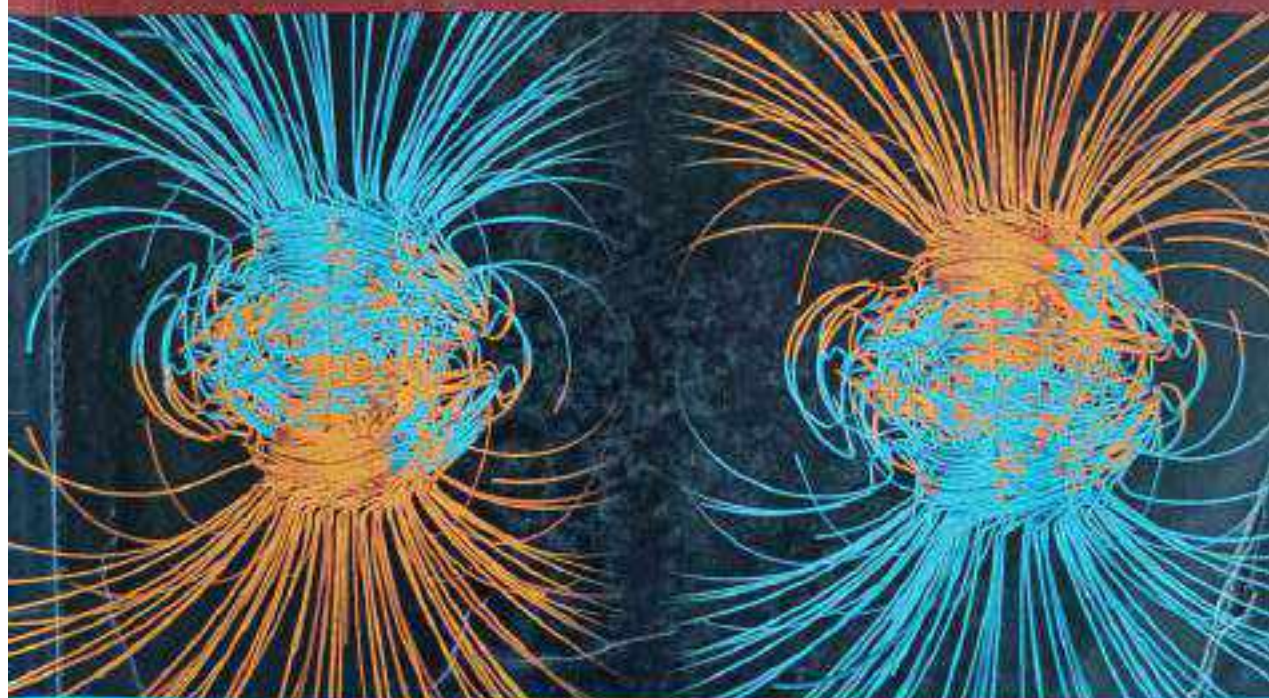
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Dedication

I would like to dedicate this book to my mother and father **Kavita S. Bajaj** and **Sahijram Bajaj**. I would like to thank my son **Chirag Gurbani** for being my stress buster and a motivating force for putting a better performance every time.

My sincerest big thanks for a lifetime to **Mr. S.K. Srivastava** of Himalaya Publishing House Pvt. Ltd. for giving me best writing advice and motivation and whose belief in this book has kept me motivated and inspired and encouraged on even the darkest of days.

- **Kiran Gurbani**

I would like to dedicate this book to my mother and father **Intekhab Fatima** and **Aalim Hussain**.

This book is dedicated to my wife. It is because of her continued support and love throughout the writing of the book that I was able to complete this task.

- **Zaidi Zari Haider**

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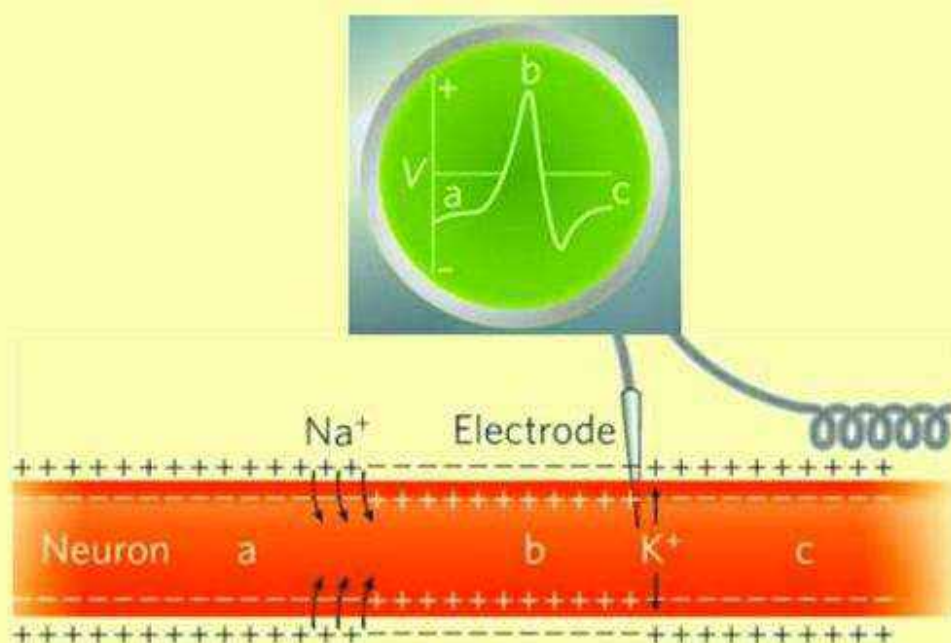
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SYLLABUS

USPH303 : Applied Physics - I

This paper consists of three modules (units) designed in a way so as to offer interdisciplinary and application oriented learning.

Learning Outcomes: On completion of this, it is expected that:

- (i) Students will be exposed to contextual real life situations.
- (ii) Students will appreciate the role of Physics in interdisciplinary areas related to materials, Bio Physics, Acoustics etc.
- (iii) The learner will understand the scope of the subject in Industry and Research.
- (iv) Experimental learning opportunities will foster creative thinking and a spirit of inquiry.

Unit I: Acoustics, Lasers and Fibre Optics (15 Lectures)

- (1) **Acoustics of Buildings:** Reverberation, Sabine's formula (without derivation) Absorption coefficient, Acoustics of Buildings, factors affecting Acoustics of Buildings, Sound distribution in an auditorium.
- (2) **Laser:** Introduction, Transition between Atomic Energy States (without derivation), Principle of Laser, Properties of Laser, Helium-Neon Laser, Application of Laser, Holography.
- (3) **Fibre Optics:** Light propagation through Fibres, Fibre Geometry, Internal reflection, Numerical Aperture, Step-Index and Graded-Index Fibres, Applications of Fibres.

Unit II: Biophysics (15 Lectures)

Introduction, definition, History and scope of biophysics, biological fluids, physico-chemical properties, viscosity, surface tension, pH, osmosis, osmotic pressure. Diffusion, Ficks' laws of diffusion, dialysis, Cell is unit of life, fundamental understanding prokaryotic and eukaryotic cell structure and function, eukaryotic cell membrane, Fundamentals of transport process through biological membrane, membrane channels. electrical properties of cell, Action potential, propagation of action potential, methods of measurement of action potential, Nernst equation, Goldman equation, The Hodgkin-Huxely model of action potential, voltage clamp technique, Patch clamp technique, cell impedance and capacitance.

Unit III: Materials – Properties and Applications (15 Lectures)

Introduction to Materials

Classification of Materials based on structures (Crystalline and Amorphous, single crystal, polycrystalline and nanomaterials) and Functionality (Conducting, insulating, superconducting, reflecting, transmitting etc.)

Types of Materials: Metals and alloys, Ceramics, Polymers and Composites, Thin Films, Nanomaterials; Some Physical and Chemical methods of materials synthesis. **(5 L)**

Properties of Materials

Electrical Properties: Review of energy band diagram for materials - conductors, semiconductors and insulators, Electrical conductivity in metals, semiconductors and insulators (dielectrics), effect of temperature on conductivity.

Optical Properties: Reflection, refraction, absorption and transmission of electromagnetic radiation in solids.

Magnetic Properties: Origin of magnetism in solids (basic idea), Types of magnetic order (paramagnetism, diamagnetism, antiferro magnetism, ferromagnetism, ferrimagnetism), magnetic hysteresis. **(6 L)**

Applications

Optical Materials: LEDs, OLEDs, LCDs, Flat Panel Displays, Optical Fibers.

Dielectric Materials: Piezoelectric, Ferroelectric and Pyroelectric Materials.

Magnetic Materials: Soft Magnets (Transformer steels), Hard Magnets for Permanent Magnets, Magnetic Recording and Storage. **(4 L)**

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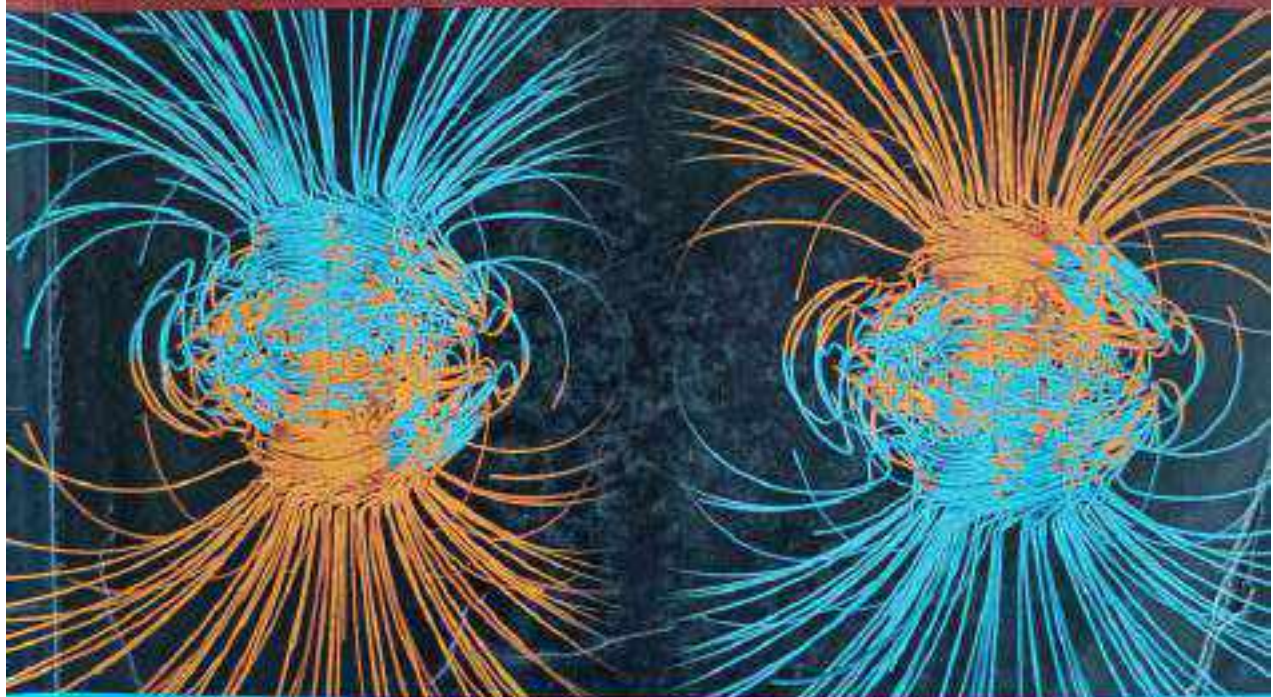
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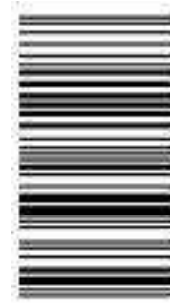


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CHAPTER 3

Phytomonitoring and Phytoremediation of Dust pollution in Mumbai

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Abstract

Dust pollution is one of the major environmental issues in Mumbai city. Current work is an attempt to analyse the efficiency of some common plants in Phytomonitoring and Phytoremediation. *Bougainvillea spectabilis* Willd., *Ficus benjamina* L., *Nerium odorum* Aiton. and *Pedilanthus tithymaloides* Poit. were used to calculate dust pollution at ten sites in Mumbai. The 10 roads selected for the study were Marine Drive, Dr Babasaheb Ambedkar Road - Dadar, Ghatkopar - Eastern Express Highway, Mulund - Lal Bahadur Shastri Marg, Borivali - Western Express Highway, Goregaon - Swami Vivekanand Road, Malad - Linking Road, Bandra - Linking Road, Bandra Kurla Complex and Krishna Chandra Marg. The leaves were washed thoroughly in first visit and collected in second visit after seven days. Vehicular densities of these sites were calculated and correlated with foliar dust deposition. Statistical analysis, Box Plots and dust maps highlighted that Borivali - Western Express Highway was dustiest site with maximum vehicles, *Nerium odorum* Aiton. was best dust capturer and the months of summer season were dustier than

References

- Bhattacharya T, Chakraborty S, Fadadu B and Bhattacharya P, 2011. Heavy metal concentration in street and leaf deposited dust in Anand city, India. *R.J. Chem. Sci.*,1(5): 61-66.
- Chaphekar SB, Boralkar DB and Shetye RP, 1980. Plants for air monitoring in industrial area. Furtado JI (Ed.) Tropical Ecology and development. I.S.T.E. Kuala Lumpur, 669-675.
- Gupta RB, Chaudhari PR and Wate SR, 2008. Overview on attenuation of industrial air pollution by Green belt development. *Jr. of Industrial Pollution Control*, 24(1): 1-8.
- Horaginamani SM, Ravichandran M and Kamdod AM, 2012. Air Pollution Tolerance of Selected Plant Species Considered for Urban Green Belt Development in Trichy. *World Journal of Environmental Biosciences*, 1(1):51-54.
- Joshi N, Bist B, Mule P and Joshi A, 2014. Importance of Common Roadside Plants as Dust Collectors in Tarapur Industrial area. *International Research Journal of Science and Engineering*, 2 (2):31-36.
- Kadiyali RL, 1996. Traffic engineering and transport planning. Khanna Publication. Delhi, 5:499.
- Manins P, Allan R and Beer T, 2001. Atmosphere. Australia State of the Environment Report 2001 (Theme Report). CSIRO Publishing, Melbourne, Australia.
- Singh SK, 1990. Phytomonitoring of Urban-Industrial Pollutants: A New Approach. *Environmental Monitoring and Assessment* 24: 27-34.



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Cartesian Coordinate System

Syllabus :

Cartesian Coordinate System : The Cartesian XY-plane, Function Graphs, Geometric Shapes, Polygonal Shapes, Areas of Shapes, Theorem of Pythagoras in 2D, Coordinates, Theorem of Pythagoras in 3D, 3D Polygons, Euler's Rule.

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Chapter

1

INTRODUCTION

OPEN SOURCE SOFTWARE

Open source software is the software which is available with source code that anyone can inspect, modify, and enhance. Open source software's designs are publicly accessible.

Programmers have access to a computer program's source code, can improve that program by adding new features to it or by correcting parts that don't work correctly. User have full control over the access and modification of the code.

Libre Office, MySQL, WordPress, Android, Firefox, Linux are examples of open source software.

Advantages of Using Open Source Software**1. Control**

User have more control over the software. They can modify the code as per own requirement. They add or keep the features they want and remove the unwanted features or parts.

2. Training

As the Source Code of the software is publicly available Open Source Programs are very helpful for the students and naive programmers to learn and make better software.

3. Security

Some people prefer open source software because they consider it more secure and stable than proprietary software. These are mostly updated software.

4. Stability

Open Source Software are long term projects, if the owner stop working on it, it will continue be updated and upgraded by someone.

FREE SOFTWARE

The Free Software Definition was written by Richard Stallman and published by Free Software Foundation (FSF) in February 1986, defines free software as being software that ensures that the end users have freedom in using, studying, sharing and modifying that software. Free software is distributed under terms that allows user to run the software for any purpose as well as to study, change, and distribute it in any adapted versions.

The term "free" is used in the sense of "free speech," not of "free of charge." Thus, "free software" is a matter of liberty, not price.

5. List any two open source database technologies.

II. Answer the following : (ANY THREE)

(15)

1. Give comparison between Free Software and Open Source Software.

2. Explain the concept "Free doesn't mean no cost".

3. Write short note on principles of open source.

4. Write a note on the following :

i) LGPL licenses

ii) Apache License

5. Discuss the problems in traditional commercial software.

6. Explain the zero marginal cost with respect to FOSS.

III. Answer the following : (ANY THREE)

(15)

1. Write a note on the following :

i) Drupal

ii) Wordpress

2. Explain five key components of Open Office.

3. How one can contribute to Wikipedia? Explain.

4. Explain the following terms :

i) Open Source Media

ii) Open source Hardware

5. Distinguish between Commercial design practices and Open Design practices.

6. Explain process of testing open source code.

IV. Answer the following : (ANY THREE)

(15)

1. Explain the features of Android operating system.

2. Write short note on Open Solaris operating system.

3. Write short note on "virtualization technology".

4. Discuss Containerization technology for IDE.

5. Write a short note on "debugger".

6. Write short note on development tools.

V. Answer the following : (ANY THREE)

(15)

1. Explain the following terms :

i) Trademark

ii) Copyleft

2. What is communication and etiquette? Discuss.

3. Explain role of open source in today's world.

4. How the mode of funding followed for Apache Web Server project?

5. Write a short note on 'Docker'.

ADVANCED WEB PROGRAMMING

- Kiran Gurbani
- Arif Patel
- Zaidi Zari Haider

```
mirror_ob.select = 0
mirror_mod.use_x = true
mirror_mod.use_y = false
mirror_mod.use_z = false
elif operation == "mirror_z":
    mirror_mod.use_x = false
    mirror_mod.use_y = false
    mirror_mod.use_z = true

#selection at the end --add back the deselected mirror modifier object
mirror_ob.select = 1
modifier_ob.select = 1
bpy.context.scene.objects.active = modifier_ob
print("Selected" + str(modifier_ob)) # modifier ob is the active ob
mirror_ob.select = 0
base = bpy.context.selected_objects[0]
base.data.object[mirror_ob.name].select = 1
```

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(As Per the New Syllabus 2018-19 of Mumbai University for B.Sc. (IT), Semester V)

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Sustainable Agriculture in the Era of Climate Change

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Chapter 5

Phytomonitoring and Mitigation of Air Pollution by Plants



Nitesh Joshi, Ambika Joshi, and Bharati Bist

Abstract The urban environment is degrading globally at a more rapid pace than seen in the last few decades. Measures are taken in order to save the environment from rapid diffusing atmospheric pollution; however, the approach seems to be too slow either due to policies by the respective governments or lack of conviction. Air pollution monitoring is the initial step toward controlling the decay of bio-sustainable air. There are various methods to monitor air quality and its components using instrumental and chemical methods. These methods prove to be expensive and do not reflect the impact on living beings. Plants are stationary; hence, they participate and indicate the changes occurring in an environment. Several studies are done globally emphasizing the role of locally available vegetation as phytomonitor. In order to do so, various morphological, visual, and biochemical parameters are employed. The concept is based on the fact that different plant species respond differently to ambient air which can be used to quantify pollution. Different plants species also react in a varied way to different air pollutants. The pattern of air pollution also differs within and between the countries. That plants act as sinks of pollution is a well-known fact. Several researchers have enormously explained the biochemical pathways of air pollutants within the plants. The current work explores the practical case studies of phytomonitoring and the function of plants in mitigating air pollution. Plants from different locations around the industrial area were studied for their morphological and biochemical changes due to air pollution. Studies carried out to know the dust-capturing efficiencies of plants are discussed. The role of plants in mitigating airborne metals, either on the surface or as accumulators, is enumerated. For development of greenbelt, several tree species are also suggested here based on their resistance to air pollutants.

Keywords Air pollution · Phytomonitoring · Greenbelts · Biomonitors · Dust load · Dust chamber studies · Air Pollution Tolerance Index

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- 487) Wilson, M.G., Polzer-Debruyne, A., Chen, S., Fernandes, S. 2007. "Shift Work Interventions for reduced work-family conflict". *Employees Relations* , 29(2):162-77.
- 488) Wood, S., Holman, D., & Stride, C. (2006). Human resource management and performance in UK call centres. *British Journal of Industrial Relations*, 44(1), 99-122.
- 489) Work-life policy [Online] Available: <http://www.worklifepolicy.org>
- 490) Yen-Hui Lin, Chih-Yong Chen, Shih-Yi Lu. (2009). Physical discomfort and psychosocial job stress among male and female operators at telecommunication call centers in Taiwan. *Applied Ergonomics* 40: pp. 561-568.
- 491) Zapf D, Isic A, Bechtoldt M, Blau P. (2003). What is typical for call centre jobs ? Job characteristics and service interactions in different call centres. *Eur J Work Organ Psychol* 2003;12:311-40.
- 492) Zapf, D. & Holz, M. (2006). "On the positive and negative effects of emotion work in organizations", *European Journal of Work and Organizational Psychology*, Vol. 15, pp. 1-28.
- 493) Zapf, D. (2002), "Emotion work and psychological well-being. A review of the literature and some conceptual considerations", *Human Resource Management Review*, Vol. 12, pp. 237-268.
- 494) Zapf, D. (2002). Emotion work and psychological well being: A review of the literature and some conceptual considerations. *Human Resource Management Review*, 12(2), 237-268.
- 495) Zapf, D., Isic, A., Bechtoldt, M., & Blau, P. (2003), "What is typical for call centre jobs? Job characteristics, and service interactions in different call centres", *European Journal of Work and Organizational Psychology*, Vol. 12, pp. 311-340.

- 496) Zapf, D., Seifert, C., Schmutte, B., Mertini, H., & Holz, M. (2001) Emotion work and job stressors and their effects on burnout. *Psychology and Health*, 16, 527–545.
- 497) Zapf, D., Seifert, C., Schmutte, B., Mertini, H., & Holz, M. (2001). Emotion work and job stressors and their effects on burnout. *Psychology and Health*, 16(5), 527–545.
- 498) Zapf, D., Vogt, C., Seifert, C., Mertini, H., & Isic, A. (1999). Emotion work as a source of stress: The concept and the development of an instrument. *European Journal of Work and Organizational Psychology*, 8, 371–400.
- 499) Zapf, D., Vogt, C., Seifert, C., Mertini, H., & Isic, A. (1999). Emotion work as a source of stress: The concept and development of an instrument. *European Journal of Work and Organizational Psychology*, 8(3), 371–400.
- 500) Zellars, K. L., Perrewé, P. L., Hochwarter, W. A. & Anderson, K. S. (2006). „The interactive effects of positive affect and conscientiousness on strain”. *Journal of Occupational Health Psychology*, Vol. 11, pp. 281-289.

Web References:

- 1) <http://creatingpositivefutures.com/stress-performance-curve/>
- 2) <http://www.ahdionline.org/Portals/0/Downloads/QualityMT.pdf>
- 3) <http://www.meser.org/journal/index.php/ajis/article/viewFile/729/760>
- 4) <http://www.mit.gov.in/download/annualreport2007-08>.
- 5) <http://www.nasscom.in/activities-6>
- 6) <http://www.nasscom.in/overview-9>
- 7) <http://assochem.org/newsdetail.php?id=4417> (2014)
- 8) <https://www.ijraset.com/fileserve.php?FID=14732>
- 9) <https://www.fredhutch.org/en/news/center-news/2001/11/graveyard-shift.html>
- 10) <http://www.union-network.org/>.
- 11) <https://www.ncbi.nlm.nih.gov/pubmed/25136159>

- 12) <http://www.prafulbidwai.org/index.php?post/2003/11/10/The-rise-of-the-cyber-cookies>
- 13) <http://www.jstor.org/stable/3600341> <http://dx.doi.org/10.1111/j.0022-2445.2004.00094.x>
- 14) BPO Newslines Issue No. 75 January 2008 www.nasscom.in <http://www.nasscom.in/Nasscom/templates/NormalPage.aspx?id=53402>.



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1. Bhaskaran, N. (Ed). (2009). Vision Juhu-Expanding Public Spaces in Mumbai. Synergy Creations. Mumbai
2. Chakraborti, Rajgopal D. (2004). The Greying of India Population Ageing in the context of Asia. Sage publications. New Delhi
3. Dandekar, K. (1996). The Elderly in India. Sage Publications
4. Government of India Ministry of Urban Development. (2015 Smart Cities-Mission Statement and Guidelines
5. Karin Wahl-Jorgensen, Thomas Hanitzsh. (2009) Handbook of Journalism. Routledge. New York
6. Liebig, Phoebe and Rajan, Irudaya, (Ed) (2005). An Ageing India: Perspectives, Prospects and Policies. Rawat Publications

7. Phoebe S. Leibig, S. Irudaya Rajan. (2005). An Aging India: Perspectives, Prospects and Policies. Rawat Publications.
8. Ramamurti, Jamuna D. (Ed) (2004). Handbook of Indian Gerontology. Serial Publications
9. Tendulkar, A. (Ed) (2016). Handbook for Senior Citizens. YCPA. Mumbai. Anokhi Publications.
10. Victor, Christina. (2005). The Social Context of Ageing. Routledge.

Journals:

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2. Role of Women Entrepreneurship in Indian Economy, International Journal of Science Technology and Management Vol.No.03, March 2016.
2. Social Scientist Volume 44 May –June 2016





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- To Introduce Students to the Indian Sociological Traditions.
- To Familiarise Students with the Research traditions in Indian Sociology
- To Acquaint Students with the Emerging Issues in Indian society

Unit I : Indian Sociological Perspectives 12 Lectures

- a. Indology and Structure--functionalism (G. S. Ghurye, M. N. Srinivas)
- b. Dialectical approach to Sociology (A. R. Desai, D.P. Mukerjee)
- c. Non- Brahmanical Approach (Dr. B. R. Ambedkar, Mahatma Phule)

Unit II : Contemporary Sociologists (Selected readings) 12 Lectures

- a. Sharmila Rege (Gender)
- b. Leela Dube (Kinship)
- c. T. K. Oommen (Religion)

Unit III : Contemporary Challenges in Indian Society 12 Lectures

- a. Strategies of caste mobilisation
- b. Resurgence of Ethnic identities
- c. Gender and Marginalization

Unit IV : Socio– Cultural Landscape of Maharashtra 09 Lectures

- a. Regional diversity and communities in Maharashtra
- b. Tourism in Maharashtra – Economy and Society
- c. Food Culture intertwined with different cultural identities

Reading List:

1. Ambedkar, B. R. (2007). “Annihilation of Caste” Critical Quest, New Delhi
2. Arya Priya, (2016). “Ethnicity in Post- Independence India: A Sociological Perspective on Its Causes and Manifestations”, IOSR Journal of Humanities and Social Sciences, Vol. 21, Issue 1, Ver. 5: 55-61.
3. Dhanagare, D. N. (1999). “Themes and perspectives in Indian Sociology” Rawat Publications
4. Deshpande, S. (2001). “Contemporary India: Sociological View” Penguin Books India Limited
5. Dsouza, Leela (.2006). “Globalisation, Nationalism and Ethnic Identities: The Future of Nation State” in Sankarama Somayaji and Ganesha Somayaji. (Eds): Sociology of Globalisation: Perspectives from India 69-97 Jaipur: Rawat Publications.

6. Dube, Leela. (2001). "Anthropological Explorations in Gender" Sage publications, New Delhi
7. Guru, Gopal. (1993). "Dalit Movement in Mainstream Sociology" EPW, 28 (14)
8. Guru, Gopal. (2016). "Shifting Categories in the Discourse of Caste and Class" EPW, Vol. 44 (14): 10-12
9. Mridul Kumar. (2019). "Reservations of Marathas in Maharashtra" Economic and Political Weekly, Vol. 44 (14): 10-12.
10. Oommen, T. K. (2001) "Religion as a Source of Violence. A Sociological Perspective" The Ecumenial Review. Vol. 53, issue 2, April 2001. PP 168 –179
11. Oommen T. K. (2005) "Crisis and Contention in Indian Society" Sage publications.
12. Omvedt, Gail. (1994). "Dalits and Democratic Revolution" Sage, New Delhi
13. Patel, Sujata. (2011). (Ed) Doing Sociology in India: Genealogies, locations and Practices. New Delhi: Oxford University Press
14. Phadnis, Urmila. (2001). "Ethnicity and Nation Building in South Asia" Sage Publications
15. Rege, Sharmila. (2006). "Writing Caste, Writing Gender: Narrating Dalit Women's Testimonies" Zubaan Publications. New Delhi
16. Teltumbade, Anand. (2016). 'Behind the Ire of Marathas', Economic and Political Weekly, Vol. 51 (40): 10-11.
17. Uberoi, Sundar, Deshpande. (2007) (Ed) Anthropology in the East. Founders of Indian Sociology and Anthropology. New Delhi, Permanent Black
18. Vivek Kumar. (2016). "Caste Contemporaneity and Assertion", Economic and Political Weekly, Vol. 51 (50): 84-86).



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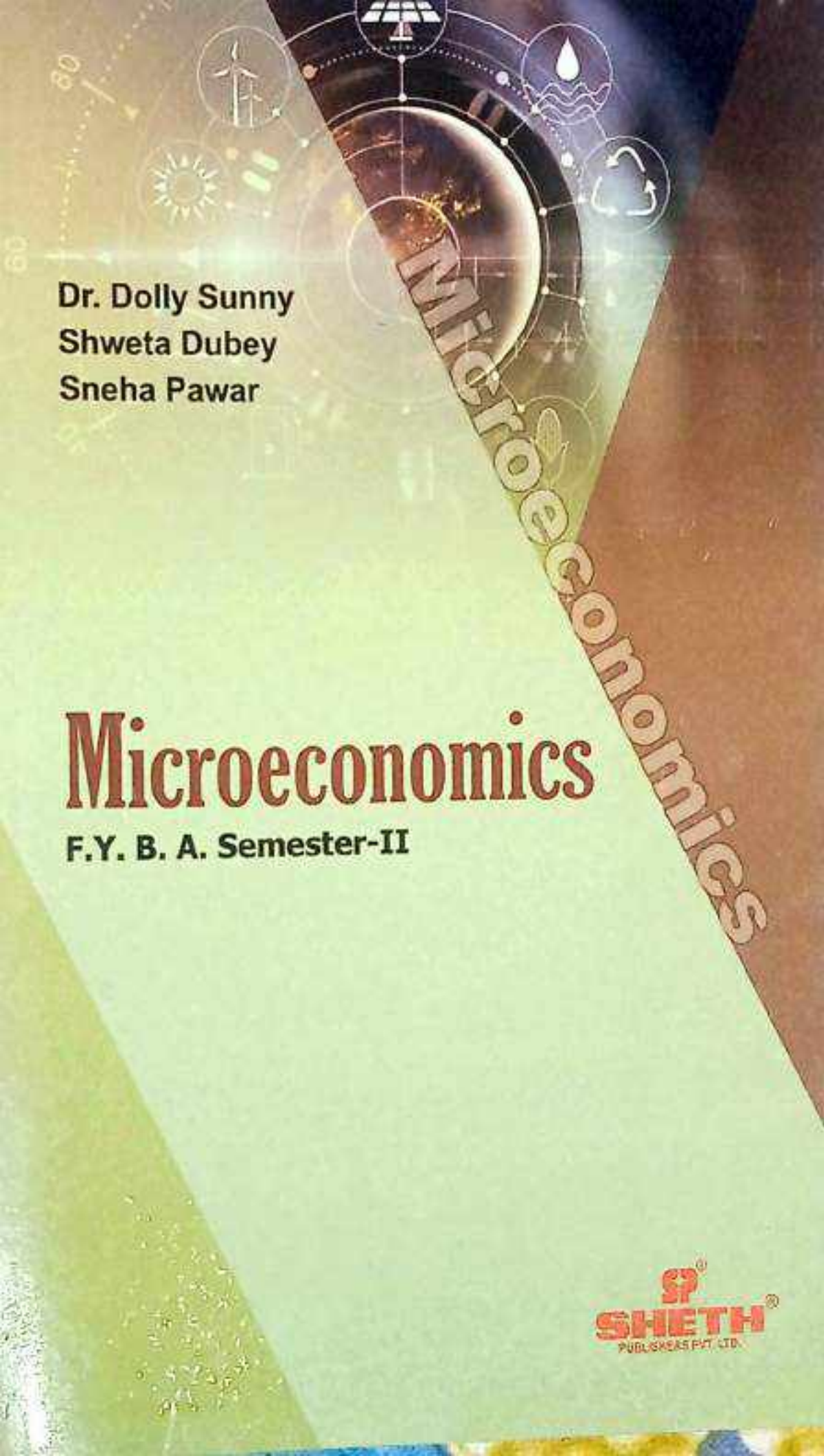
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Financial Inclusion and its Impact in India: An Empirical Analysis

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Abstract

Financial inclusion is one of the powerful scheme on emerging concept develop the banking habit for improving financial service through unbanked area. Financial inclusion is affordable cost reduce minimum formalities to open no frill account independently occupying customer. Banking sector contribute unique service of financial inclusion reach for unaware customer sharing innovate technology through financial transaction. Financial inclusion are mainly through service to self help group women getting financial assistance, government subsidy on agriculture loan and receiving pension fund scheme in banking sector. Financial inclusion is sustainable growth of banking technology. Financial inclusion is a wider concept; bankers do not collect cost of expenditure to open account under financial inclusion scheme. The present research article is based on primary data collected using interview schedule technique from 150 respondents staying in Vada of Palghar District, Maharashtra.

Keywords: Financial Inclusion, Banking Sector, Financial Literacy

Introduction

Financial inclusion is delivery of financial service to promote banking activities by sharing the financial product through banking institutions. Financial inclusion is primary role support on weaker section the people, they have access to financial products like saving, insurance and credit among customer. Financial inclusion is mainstream open no frills account without cost of expenditure his bank's full support and co-ordination. Rural customer not having access to banking can avail the facility. Financial inclusion is policy implementation to assist marginalized people, saving deposits in bank, better financial assistance and inculcating banking habits. Financial inclusion could be for individual or an business man can have access financial service, credit facilities are available without any cost of expenditure with minimum formalities to open account in unbanked area.

Financial inclusion aims at activities not only receiving

credit facilities but also to enjoy multiphase economic benefit. It is focused on weaker section of the people; promotes the financial service opening saving account for purpose of financial transaction to reach unreached population as yet. Reserve bank of India finalized a special committee to determine financial inclusion scheme. RBI introduced opening of bank account at no cost of expenditure and including number of financial products through banking institutions. Financial inclusion scheme focused on social welfare activities based on economically weaker section of population freely operating banking function in unreached areas. It lays greater emphasis on effective credit delivery mechanism for enhancing priority sector of micro finance support self help group women, government subsidy of farmers, financial assistance and contribute LPG subsidy to weaker section of the people. It is focused on developing policies and promoting banking technology sharing on vulnerable group of people access

digitalized cash transactions.

Financial inclusion is comprehensively strategy development of banking polices providing digitalized financial transactions to accelerate unbanked villages. Banking committee reviewed to identify banking service on electronic device payment of cash transfer through digitalized model. Financial inclusion is survey based on ECD/INFE methodology financial literacy is measured across three components viz. financial knowledge, attitude, and behavior of customer. Digitalized financial transaction is gaining more valuable service of illiteracy people to explore financial service in rural area. Banking institutions create awareness programme of financial inclusion scheme; people are benefited for credit delivery through digital transaction in urban area.

Objectives

1. To assess financial inclusion of no frill account holder are benefited banking technology through unbanked customer
2. To measure role of financial inclusion and its impact on banking institutions among unaware customer in rural area.
3. To examine factor of financial inclusion on no frill account holders for lengthy procedure of banking formalities.

Methodology & Analysis of Data

The present research article is based on primary data collected using interview schedule technique. Vada is the area selected in Palghar District in Maharashtra. Vada has three banks. 50 customers were considered in three banks each. Total number of respondents (T.N.R) were 150. That is total 150 customers were considered for the interview.

Table-1 - Profile of the Respondents

Profile	Variables	Total respondents	percentage	Grand Total	
				T.N.R	%
Age (year)	25-30	35	23.33	150	100
	31-35	55	36.66		
	36-40	24	16		
	41-45	36	24		
Education	Illiterate	22	14.67	150	100
	Primary	36	24		
	Middle class	15	10		
	High school	27	18		
	Graduation	24	16		
Gender	Male	84	56	150	100
	Female	66	44		
Marital status	Married	54	36	150	100
	Unmarried	72	48		
	Widow	16	10.67		
	Divorce	8	5.33		

Occupation	Job	38	25.33	150	100
	Own business	55	36.67		
	Farmer	43	28.67		
Annual income	Land less labour	14	9.33	150	100
	Below-Rs.25000	72	48		
	Rs.26000-Rs.36000	40	26.67		
	RS.37000-RS.47000	38	25.33		
Type of family	Nuclear	78	52	150	100
	Joint	52	48		
Family Members	Below-4	74	49.33	150	100
	05-Jul	64	42.67		
	8 and above	12	8		
Bank	Yes	66	44	150	100
	No	84	56		
Account Holders	Yes	98	65.33	150	100
	No	52	34.67		

Sources: Primary Data-2019

Table-2 - Function of No-Frill Account

Function	Particulars	Total	Percentage	Grand Total *	
				T.N.R	%
Open No frill account	Yes	72	48	150	100
	No	78	52		
Source of Information	Banker	38	25.33		
	Friends	34	22.67		
	Relatives	30	20		
	Colleagues	22	14.67		
	NGO	1	0.67		
	Panchayat level federation	17	11.33		
	Others	8	5.33		
Purpose of Account	LPG	8	5.33	150	100
	MGNREGS	22	14.67		
	SHG	6	4		
	Government subsidy	33	22		
Bank wise Account	Farmer loan	45	30		
	Salary	32	21.33		
	Pension fund	4	2.67		
	Public sector	28	18.67		
Private sector	58	38.67			
Co-operative bank	42	28			
Regional rural bank	22	14.67			
Account Holders	One	68	45.33	150	100
	Two	58	38.67		

Types of Account	Three			150	100
		24	16		
Types of Account	Saving	85	56.67		
	Current	44	29.33		
	Fixed deposit	16	10.67		
	Recurring deposit	5	3.33		
Visited Bank	One	54	36	150	100
	Two	67	44.67		
	Three	21	14		
	Four	8	5.33		
Benefits	Loan	26	17.33	150	100
	Locker facility	38	25.33		
	Credit card	26	17.33		
	Debit card	28	18.67		
	Mortgage	17	11.33		
	Deposit and withdraw Cash	15	10		

Sources: Primary Data 2019

The primary data were collected during the months from March 2019 to June 2019.

As is clear from the Table-1 over 55% of the respondents (about 60 %) are aged 25-35 years. About 15 % of the respondents are illiterate and 33 % are Graduates and post graduates.

It is found that about 25 % of the respondents are employed, 37 % are doing own business, 29 % farmers and other 9 % agricultural labourers. As many as 48 % of the respondents stating their annual income to be Rs. 25000, and less indicates that the study area is predominantly economically weak. 27 % stated to be earning an annual income of Rs.26, 000-36,000 indicates a moderately better economic standard. To the query of bank' presence in the village 44 % of the respondents answered an affirmative.

Of the 150 respondents, 48% stated to have opened no frill account. As many as 39 % of the respondents were found to have opened account in private sector banks, followed by Co-operative Banks (28 %), Public Sector Banks (19%) and Regional Rural Banks (14%). An analysis of type of account opened reveals that over 55 % (57 %) have opened Saving account while 29 % have opened current account. Few have fixed/recurring deposits.

45 % of the respondents were found to have one account, 39 % stated to have hold two accounts and 16 % stated to have three accounts As regard purpose of opening of an account, about 21% of the respondents stated to have opened account to deposit their salary while 22% stated to have opened account to facilitate Government to credit subsidy amount to their bank accounts. As many as 30% stated to

have opened for farm loan purposes. Other purposes include crediting MGNRES remuneration (153), LPG subsidy (52), SHG (42) and Pension Fund (about (32).

An analysis of benefit of holding bank account revealed the perceived benefit of the respondents to be availing the locker facility (25%), availing loan (17%), credit card facility (17%), debit card facility (19%), mortgage facility (11%) and cash transaction (10%) - that is deposit of withdrawal of cash.

Table-3 presents the factors considered for financial inclusion.

Factor	VHL	HL	NO	IX	LL	Total
Poor communication network	37(24.6)	48(32)	32(21.3)	18(12)	15(10)	150(100)
Lengthy procedures of banking services	44(29.3)	32(21.3)	37(24.6)	15(10)	22(14.8)	150(100)
Awareness in information technology	48(32)	55(36.6)	34(22.6)	8(5.3)	5(3.3)	150(100)
Lacking of financial service	32(21.3)	44(29.3)	37(24.6)	19(12.6)	18(12)	150(100)
No regularity in functioning	55(36.6)	46(30.6)	15(10)	14(9.3)	20(13.3)	150(100)
Lacking of CRM	48(32)	55(36.6)	32(21.3)	10(6.6)	5(3.3)	150(100)
Inadequate of ATM services	44(29.3)	37(24.6)	18(12)	15(10)	36(24)	150(100)
Delay on Pension payments	55(36.6)	34(22.6)	27(18)	20(13.3)	14(9.3)	150(100)
Insufficient of On-line service	32(21.3)	48(32)	19(12.6)	8(5.3)	43(28.6)	150(100)
Service quality of Safe lockers facilities	37(24.6)	69(46)	20(13.3)	10(6.6)	14(9.3)	150(100)

Sources: Primary data. Notes: VHL- Very High level, HL- High level, LL- Least level

It is inferred from Table-3 that poor communication network (32%) lengthy procedures! 36%) irregular functioning (31%), Poor CRM (37%) and indifferent online services are functioning of the bank. Financial inclusion is concept open no-frill account in banking sector framing guideline for the purpose of service to banking and financial service. Banking institutions fully pledged is primary motive of service sector is promoting unbanked areas.

The Main Suggestions for Better Functioning are as follows:

1. Rural customers lack awareness of information technology such as on-line banking, ATM, direct payment of financial transaction through net banking activities. Customers' reach of banking technology regarding electronic device payments and receipts sharing communication networks is lacking. Hence efforts should be made to create awareness through campaign, public addressing etc.
2. CRM is sustainable development of banking function all aspect of social growth for promoting financial and non-financial service provider in unreached

- customers. Customer relationship management should lead to increasing financial service and better inclusion.
- Private sector, co-operative bank are not given important for financial service especially financial inclusion of no frill account holder. Private sector bank follows lengthy procedures to open bank account given number of instruction and submitted documents after opening bank account. Reserve bank of India must be give new regulations to avoid lengthy formalities to open no frill account in private bank.
 - Banking institutions must be creating financial inclusion of service quality on banking service by conducting special programme for customers.
 - Rural customer are not aware of the benefits of bank and there is no awareness of banking financial transactions validity. Banking institutions must recruit rural youth as business support agents who can guide villagers in opening accounts in banks.

Conclusion

Financial inclusion is one of the wonderful schemes for opening no frill account in unbaked area. Financial inclusion service developments of banking technology however, reach customer bank account independently operating for financial services between bankers and customer. Customers getting government subsidy utilizing numbers of financial scheme are available in banking sector. Financial inclusion is liberalize financial service of unaware customer promote socioeconomic growth in our Indian economy. Financial inclusion considering customer KYC tool sharing financial as well as banking technology in unbanked area, would help in better inclusion of weaker section. Banking institutions must be promoting financial inclusion and ensure economic benefit for weaker section through user-friendly procedures and approaches. Employing educated unemployed youth in villages would help the banks in promoting banking success to rural areas as also providing employment opportunities to unemployed youth.

REFERENCES:

- Akhil Damodaran. (2014). Financial Inclusion: Issues and Challenges Department of Management Studies, Indian Institute of Technology, New Delhi Vol. 4, No. 2
- Anjali S. and Trivedi. (2016). Role of Banks for

- Financial Inclusion in Gujarat, International Multidisciplinary Research Journal, Vol.2, No. 1, pp. 19
- Anupama Sharma and Sumita Kukreja. (2012). An Analytical Study: Relevance of Financial Inclusion For Developing Nations Vol 2, No: 6, pp 15-20.
- Divyesh Kumar. Financial Inclusion Using Pradhan Mantri Jan-Dhan Yojana - A Conceptual Study. Vol.2.No.3. pp.10-25.
- Guru (2017). Role of Financial institutions on inclusive growth National Monthly Refereed Journal of Research in Commerce & Management. Vol.1, No.3.pp.123-125.
- Jindal S and Singh K, Financial Inclusion in India: Shifting the Base towards Crowning Glory. Vol. 5, No.3, pp.15-20.
- Mala and G. Vasanth. (2016). Role of banking sector in financial inclusion International Journal of Computational Research and Development Vol.1 No. 3, pp 1-25.
- Porkodi and Aravazhi March (2013) Role of micro finance and self help groups in financial inclusion, Financial Services & Management Research Vol.2, No. 3, pp 12-20.
- Raja Babu. (2013). Measures for Achieving Financial Inclusion in India and Its Inclusive Growth. International Journal of Research Vol.6, No.3, pp.10-25.
- Shabna Mol TP. (2016). awareness and access of financial inclusion drive a study of below Poverty Line Households in kerala, Vol.3 No.4, pp 201-204.
- Sibi M.S. Ananth. (2016). Financial Inclusion in Tamil Nadu: A Bankers Initiatives to Breach the Society Vol.3 No.4, pp.1-18.
- Siva Kumar Santosh Ranganath. (2013). Asia Pacific Journal of Research in Business Management Financial Inclusion in India, The Journal of Sri Krishna Research & Educational Consortium, Vol.5, No.5, pp.21-25.
- Subha.k. and Rajamohan, Bankers Familiarity and Preference towards Financial Inclusion in Sivaganga District Management and Social Sciences, Vol.5, No.5, pp.1-25.
- Vipin Kumar Aggarwal. (2014), financial inclusion in India: An analytical study.



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NON FICTIONAL AND SACRED WAYS TO MANAGE LIFE SKILLS

(Laid down 1450 years ago by untutored Prophet)

Dr Ashfaq Ahmad Khan

Abstract

Life skills are abilities for adaptive and positive behavior that enable humans to deal effectively with the demands and challenges of life. This concept is also termed as psychosocial competency. What the 21st century is expecting and increasing from mankind. In this materialistic world, life skills are associated with promotional activities; it may be promotion of commodities, businesses and ideas. It's very objective is customary and professional in approach. An attempt has been made to compile some imperative, contemporary, empirical and fool proof life skills laid down by the Prophet Muhammad (SAW) some 1450 years ago. Be it Social, Cultural, Economical or Religious provided standards to mankind. Above all the Almighty gave them a certificate of success and made them a benchmark for the rest of mankind. From tribes they became Companions of the Prophet Muhammad (SAW) Therefore an effort has been made to compile those lost, unconventional, sacred and divine skills followed by earlier Muslims. May Allah make it a source of inspiration for all us. For example, the following are few teachings of Prophet Muhammad (SAW). *Ayoubah Radiyallahu 'anhu* narrated that Prophet Muhammad (SAW) ordered us to treat people according to their status. *Sahih Muslim*. *Jahir ibn 'Abdullah Radiyallahu 'anhu* narrated that Prophet Muhammad (SAW) prayed May Allah confer mercy upon a man who is kindly, when selling, when buying, and when demanding his balance. *(Bukhari)*. *Abu Hurayrah Radiyallahu 'anhu* narrates that Prophet Muhammad (SAW) said: A Believer's soul is attached (preventing his entry to Paradise) to his debt till it is paid. *(Tirmidhi)*.

Key words:

Life skills, Prophet Muhammad, Sahaba-(Companions), Hadith-(Saying of Prophet SAW), Quran, Islam, Sallallahu alaihi wa sallam(SAW)-(Puce be upon him), Radiyallahu 'anhu (RA) May the Almighty be pleased with him.



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Introduction

"The term 'Life Skills' refers to the skills you need to make the most out of life."

Life skills are abilities for adaptive and positive behavior that enable humans to deal effectively with the demands and challenges of life. This concept is also termed as psychosocial competency. The subject varies greatly depending on social norms and community expectations but skills that function for well-being and aid individuals to develop into active and productive members of their communities are considered as life skills.

The World Health Organization in 1999 identified the following core cross-cultural areas of life skills:

- Decision-making and problem-solving;
- Creative thinking and critical thinking;
- Communication and interpersonal skills;
- Self-awareness and empathy;



32. Abdullah ibne-Umar Radhyallahu 'anhuma narrates that Prophet Muhammad ﷺ (SAW) said: He who raises weapons at us, is not from us. (Muslim)
33. Yazid Radhyallahu 'anhu narrated that Prophet Muhammad ﷺ (SAW) said: Undoubtedly none of you should take the belongings of his brother, neither in amusement nor seriously. (Abu Dawud)
34. Abdullah ibne-Mas'ud Radhyallahu 'anhu narrated that Prophet Muhammad ﷺ (SAW) said: It is not befitting for a believer to curse others. (Tirmidhi)
35. Abu Darda' Radhyallahu 'anhu narrated that Prophet Muhammad ﷺ (SAW) said: He who mentions a fault in a person, which is not present in him so as to defame him, Allah will detain him in Hell-fire till he proves what he said. (Tabarani, Majma' Uz-Zawaid)
36. Abu Hurairah Radhyallahu 'anhu narrates that Prophet Muhammad ﷺ (SAW) said: There are three signs of a hypocrite: When He Speaks, he lies; when he promises, he breaks it; when he is entrusted, he violates the trust. (Muslim)
37. Anas ibne-Hasan Radhyallahu 'anhuma narrated that Prophet Muhammad ﷺ (SAW) said: Whoever plunders is not from us. (Tirmidhi)
38. Humaid ibne- Abdur Rahman narrates from his mother Radhyallahu 'anha that Prophet Muhammad ﷺ (SAW) said: He who has spoken untruthfully to strike a reconciliation between two people has not lied. (Abu Dawud)
39. Abu Hurairah Radhyallahu 'anhu narrates that Prophet Muhammad ﷺ (SAW) said: He is not from us who investigates a woman against her husband, or a slave against his master. (Abu Dawood)
40. Urs ibne-Umarah Al-Kindi Radhyallahu 'anhu narrated that Prophet Muhammad ﷺ (SAW) said: When a sin is committed on the earth; he who sees it and disapproves it, will be like the one who wasn't present. And the one who wasn't present when the sin was committed but approves of it, will like the one who was present there. (Abu Dawud)

Conclusion

May The Almighty shower his bounties on the companions who recorded, memorized and saved every aspect of beloved Prophet Muhammad ﷺ (SAW) for the guidance of mankind in both the world. These are few selected teachings of the Prophet. While going through this we can understand their relevance in today's world for peaceful life be it personal, social, economic, spiritual or formal engagement. An effort was made to compile these lost, unconventional, sacred and divine skills followed by *entire* followers of Islam. May the almighty Allah (God) make it a source of inspiration for all us.

References

- Books of Hadiths: Bukhari, Abu Dawud, Muslim etc.
 Mustalah Ahadith
<http://www.life-skillsyouneed.com/general/life-skills.html>

MARINE LIFE DISTURBANCE DUE TO ABANDONED GEARS

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ABSTRACT

The present study describes the problems created by fisherman's activities and their effects on aquatic life disturbance. Visit to various beaches has proven that fishermen usually throw their derelict nets and gears in marine waters. It not only leads to pollution of the marine environment but also disturbs aquatic life. Sharp tools of fishery injure many aquatic animals. Derelict nets thrown by fishermen, trap crabs and other aquatic animals. Such animals lose their body parts or even die. Derelict nets also intertwine mangroove trees and sometimes root out complete plant due to pressure. Heavy gears get settled to the bottom and disturb the beneath aquatic system.

Keywords: Fisherman, aquatic life disturbance, derelict gears, Marine pollution,

INTRODUCTION

Derelict fishing gear is accidentally lost or intentionally discarded or abandoned. These include fishing lines, nets, pots, traps, or other gear associated with commercial or recreational fishing. (1) It is observed that most of the time fishermen dump such derelict fishing gears into the water bodies. Review on various research has manifested that fishing gear is a major component of the marine debris problem worldwide and has been identified as one of the most biologically threatening types of marine debris. (2) Derelict gear damages the marine ecosystem in different ways, directly and indirectly. (3) Approximately 10% of marine debris is fishing gear. (3) Some sharp fishing gears injure marine animals, amputate their body parts and sometimes even kill them. Many of these types of equipment are made of synthetic materials (1). Plastic in the seas is a dramatically increasing problem and has been described as a serious pollution aspect that also includes nylon debris coming from either discarded or lost fishing gear. (4) The root cause of the issue is the increased use of plastic and nylon fishing gear that when left in the marine environment persists for decades. (5) Fishing gears made of persistent synthetic material, can impact marine fauna such as sea birds, turtles, seals or cetaceans through entanglement or ingestion. These nets entangle marine animals and plants in them. Entanglement is generally considered far more likely a cause of mortality than ingestion. The high accumulation potential suggests that microplastics could be a potential source of toxic chemicals in the marine environment. (5) Some of the most affected animals include cetaceans, pinnipeds, seabirds and marine turtles and certainly fish. (6)



A specimen of *Caretta caretta* found on 13 September 2004 in Terceira Island, Azores. With a piece of nylon long line that caused a necrotic process. (7)



A specimen of *Caretta caretta* found on 2 April 2008 in Terceira Island, Azores, entangled in a bowl of plastic lines and with its left forelimb already amputated and cicatrized. Photos by JPB (7)

Derelict net has completely derooted an aquatic plant.



Plastic has covered most of the branches of Mangroove plant.



Decorator worm has taken plastic on the body instead of the shell for camouflage.

DISCUSSION:

Derelict fishing gear is not only disturbing the marine ecosystem but also it is interfering with the lives of marine organisms. It can severely affect marine life if any action against it is not taken. Marine capture can be affected and sunken gears disrupt benthos which is responsible for nutrient up whelming. Plastic materials break down and convert into microplastic it may become part of the organic food chain and can cause biomagnifications. Serious injury due to derelict gears can reduce the number of marine organisms. Not only has this plastic coating to photosynthetic organisms affected primary producers of the food chain.

CONCLUSIONS:

Cleaning of beaches must be taken into action. There must be some strict law against throwing derelict gears or any waste product into water bodies. Fishermen must be educated, on how their carelessness can affect the fish count. Government must take waste derelict gears in their custody for recycling.

REFERENCES:

1. Dayton, P. K., Thrush, S. F., Agardy, M. T., & Hofman, R. J. (1995). Environmental effects of marine fishing. *Aquatic conservation: marine and freshwater ecosystems*, 5(3), 205-232.
2. Ryan, P. G., & Moloney, C. L. (1993). Marine litter keeps increasing. *Nature*, 361(6407), 23-23.
3. Macfadyen, G., Huntington, T., & Cappell, R. (2009). Abandoned, lost or otherwise discarded fishing gear.p115
4. Butterworth, A., Clegg, L., & Bass, C. (2012). *Untangled—Marine debris: a global picture of the impact on animal welfare and of animal-focused solutions*. World Society for the Protection of Animals, London.
5. Macfadyen, G., Huntington, T., & Cappell, R. (2009). Abandoned, lost or otherwise discarded fishing gear.pxvi
6. Barreiros, J. P., & Guerreiro, O. (2014). Notes on a plastic debris collar on a juvenile *Pagellus acarne* (Perciformes: Sparidae) from Tereceira Island, Azores, NE Atlantic. *Bothalia—Pretoria*, 44, 2-5.
7. Barreiros, J. P., & Raykov, V. S. (2014). Lethal lesions and amputation caused by plastic debris and fishing gear on the loggerhead turtle *Caretta caretta* (Linnaeus, 1758).
8. Gilardi, K. V., Carlson-Bremer, D., June, J. A., Antonelis, K., Broadhurst, G., & Cowan, T. (2019). Species mortality in derelict fishing nets in Puget Sound, WA and the cost/benefits of dere...

Marine pollution bulletin, 60(3), 376-382. ACKNOWLEDGEMENT: We are extremely th

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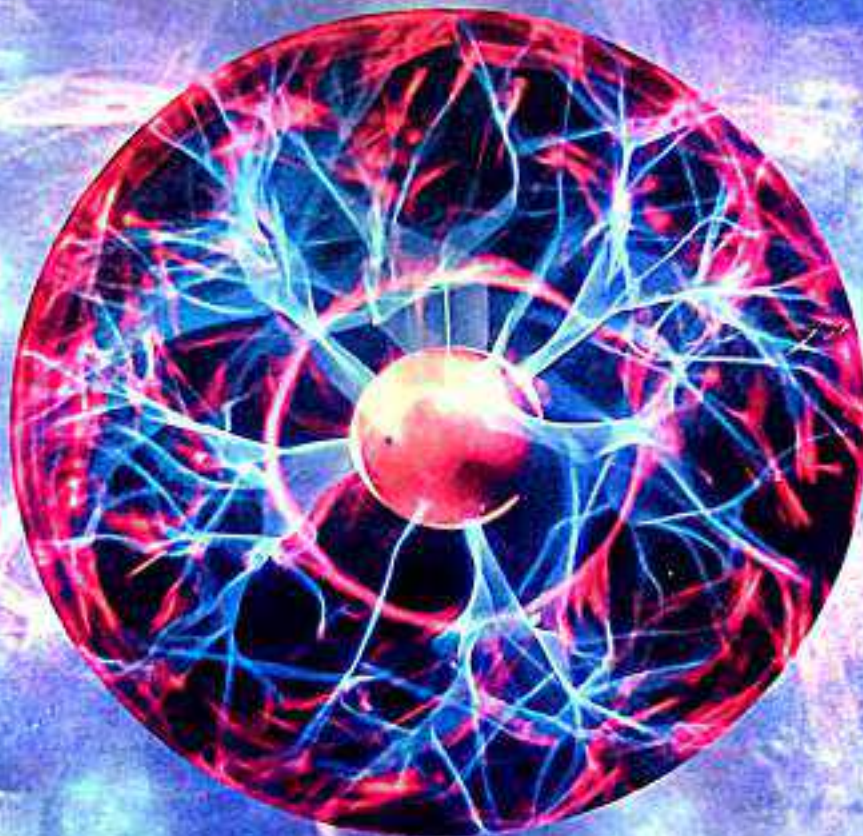


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Emotional Intelligence Study on Adolescent Students

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Abstract

The study has been conducted on a sample of 40 adolescent students selected from SSC board English medium school Khar, Mumbai. A standardized of Emotional Intelligence Scale, constructed by Anukool Hyde, Sanjyot Pethe and Upinder Dhar, was used which contains 34 items for measuring different aspect of emotional intelligence. The respondent were required to indicate their view on five point scale i.e. Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree. On the given range High, Normal and Low emotional intelligence is calculated on the basis of their areas. The findings show that most of the adolescent students are having high levels of Emotional intelligence, very few were normal, and no adolescent students were found to be low Emotional intelligence.

Keywords : Emotional intelligence, Self-awareness, Empathy, Motivation, Self-development

Introduction

Although a person's feelings cannot be observed directly by others but they can be inferred from his overt behavior and verbal report of his introspection, as one can doubt the reality of emotions as conscious experience. To product an emotion, a stimulus situation must be related employee feels the presence of a threatening situation, he may handle the situation and may see it as a challenging opportunity to prove himself or experience fear or dread. Thus, our appraisal of situation and subsequent emotions are strongly influenced by our own estimate of capabilities. The emotions aroused depend not so much on the events themselves, as on how they are appraised.

Need of the Study

Our education has always emphasized on academic results, but is that all we need to get success in our life? Why are students performing very well in schools and called as best

students not able to handle the college / peer pressure, is this something which can't be handled or these students have never been taught about this. Emotions do affect how and what we learn. Being more aware of our emotions and reaction to it will help us manage the stress. Once we learn to understand our emotions we will be able to communicate better.

Areas of Emotional Intelligence

Self-Awareness: Identify your emotions; ask "How am I feeling today". Put a name to that emotion. Take a identifying what thought led to this emotion will help us to understand the reason for the way we feel.

Empathy; Start observing others emotions, respond to others in a way that you would want someone to respond to you. Try to put yourself in other shoes and understand their perspective being empathetic will help you handle the situations well.

the sample and the scope of the study were limited; however, the purpose was to gain a greater understanding of the phenomenon under investigation. Future research can be around the following:

- Further research should be conducted among the not just the students, but also among the teachers in order to check the emotional intelligence.
- Research study should have conducted with regard to Teachers Development Programmed and Co-operative Learning.
- Research should also be conducted on assessing the relationship between leadership and emotional intelligence
- Research should be conducted in studying in detail the most relevant jobs in which EQ competencies make up the critical elements for effective performance.

Conclusion

Thus, we can conclude that most of the students are having high levels of Emotional intelligence such as Self-

awareness, Empathy, Motivation, Self-development, Managing relations, Value-orientation, Emotional Stability, Commitment and Altruism. The scores were high among the adolescents and Altruism scores of no adolescents were low on the above factors of emotional intelligence.

REFERENCES:

1. Michael Joshua Carter (2015), Exploring the Relationship Between Study Abroad and Emotional Intelligence
2. Joice, Swarnalatha (2015), A study on the Emotional Intelligence Levels of the urban students – with special reference to SVKM's
3. Victor Dulewicz (2003), Leadership at the turn of the century: the need for intelligence in organizations
4. Peter Salovey and David J. Sluyter (1997), Emotional development and emotional intelligence

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A Study on Impact of Empowerment on Woman Entrepreneurs in India

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Abstract

A powerless needs and struggles for power so that one can become so empowered that one can enjoy the upper strata status. Similarly, same fundamental can be applied in entrepreneurship where one upgrades oneself from being employee to employer.

We can clearly see that there is an up gradation from powerless to empower or from job seeker to job giver. I.e. an entrepreneur. This differentiation between the two i.e. (i) empowerment and (ii) entrepreneur can be seen across the globe with different intensity. This differentiation is amongst various religion, culture, race and religion.

But one thing is common amongst above demographical component is power differentiation between male and female, which also creates base for differential rate of entrepreneurship between males and females. LGBTQ community is also our societal part but they are still in a phase of recognition. Thus to rule out this difference, need for woman empowerment for woman entrepreneurship is required.

Empowerment is nothing but, a process of becoming stronger and more confident especially in controlling one's life and clamming one's rights. Whereas, woman entrepreneurship is a process in which woman initiates a business, gathers all resources, undertakes risks, faces challenges and provides employment to others and manages the business. But, due to family and societal pressure gender discrimination and stereotypical patriarchal society she is suppressed and unable to display her knowledge, skills and abilities. Thus, to showcase her talents and abilities empowerment is required.

With the help of descriptive research, we will examine various eminent woman entrepreneurs' struggles and problems they faced. Find out the results of how they overcame the challenges by making use of the available situational opportunities and made their essential contribution to achieve the goal of 5 trillion economies.

Keywords: *woman entrepreneurs, empowerment, challenges, opportunities*

Introduction

Women are an important section of the society, hence empowering woman to be an entrepreneur is essential for the socio-economic and political progress of India as 1/3rd of the budding entrepreneurs in India are woman which contribute to a major share in achieving India's 5 trillion economy. Due to male dominance it is nearly impossible for them to reach their goal. Thus, to remove the gender biasness and to create neutrality between men and woman giving power to woman is the need of the hour to treat them in level with men. For woman to achieve their vision and have faith in it, determination, believe in one's ideas, skills and abilities are required and this is possible only when woman are being empowered. Woman entrepreneurs face

various hurdles and barriers which are pulling them back in achieving their dream.

Review of Literature

This literature states the areas where woman empowerment relevant issues have already being articulated.

Dufflo E. (2011) states the weak relationship between Empowerment and *Development*. It further states that to improve the prevailing condition and better the situation it is essential to be self-sustaining and continuous policy development is essential to bring about gender neutrality and treat men and woman equally.

H. Subrahmanyam (2011) states *education* is an essential part in woman empowerment; it gives woman the knowledge and creates awareness amongst them. A brief

comparison was made between the past and present rate of education, which significantly showed a drastic improvement in the enrollment rate of girls in the field of education in urban rural areas.

Venkata Ravi and Venkatraman (2005) focused on empowerment of woman entrepreneurs through SHG helped woman to maintain work life balance and to control both family matters and career.

Nayyar et al (2007) focused on the *qualities and skills* essential for woman to be successful entrepreneurs. Further studied the work life balance is essential to maintain both career and personal life.

Mathew and Panchanatham (2011) focused on the role conflict, quality of health, problems in time management, no social support are major hindrances and obstacles of woman on the part of becoming successful entrepreneurs and how the overcome the hurdles are discussed.

Objectives of the Study

1. To identify the challenges and obstacles in the path of woman entrepreneurs.
2. To know the implication of various government schemes for woman empowerment.
3. To know the importance of woman empowerment for woman entrepreneurs
4. To identify the path through which woman becomes a major contributor towards achieving the 5 trillion economic growth.

Research Methodology

The type of research used is descriptive research. 10 woman entrepreneurs are studied across various sectors their challenges and obstacles in the way of becoming entrepreneurs are analyzed.

Data is sourced through secondary data which includes journals, research papers and management books. The objective of the study is to analyze the obstacles faced by woman entrepreneurs and provide a solution for the by studying the implication of various government schemes.

Problems Faced By Woman Entrepreneurs

After analyzing the few woman entrepreneurs, the following were the major obstacle which caused a major hurdle in the path of entrepreneurship

1. Funding

Initial investment, raising capital and getting loans from the banks is always difficult for woman in comparison to man. The major reason being the credit worthiness of a woman, this is due to the perception that woman's leave the business anytime.

Solution

The problem of funding arises as there is always a trust issue

with woman entrepreneurs because their skills are doubted and knowledge of the business is suspected. Hence, to eradicate these issues as a mean of obstacle in the path of woman entrepreneur's government of India has come up with the following schemes to help budding woman entrepreneurs overcome the challenges of funding.

- a. Mudra Yojna Scheme
- b. TREAD (Trade Related Entrepreneurship Assistance)
- c. Mahila Udyam Nidhi Scheme
- d. Annapura Scheme
- e. Stree Shakti Package for Woman Entrepreneur

2. Societal Pressure

In Indian Society males are always given an upper hand and considered superior over woman, thus males do not encourage females to be entrepreneurs and more successful over them due to ego issues. Due to this pattern, many restriction are made on woman which are created by the society. Woman earning money had become a societal stigma. There is no family support, woman are expected to spend more time with the family, there is role conflict which she is supposed to address.

Solution

The Government of India has made many provisions for woman entrepreneurs to build their trust and self-confidence and be in equal power with men. Few initiatives by the Government to support woman entrepreneurs in both rural and urban areas.

- a. Mahila Shakti Kendra-Rural Woman empowerment
- b. Pradhan Mantri Matritva Vandana Yojna- For mothers.
- c. Priyadarshini-Self Help Group
- d. Rajiv Gandhi scheme-for Adolescence girls
- e. Sunkanya Samridhni Yojna-Saving Schemes for girls.

3. Patriarchal Society

Patriarchy imposes masculinity and feminists character stereotypes in the society which creates inequalities of power between men and women. Woman are considered as Paraya Dhan (liability) thus, denied rights, treated unfairly, and unequally which eventually gives rise to dowry system which is illegal in India yet still in practice.

Solution

To curb patriarchy system and to promote gender equality government of India has made some provisions:

- a. The Dowry prohibition Act, 1961
- b. The Maternity Benefit Act, 1961
- c. The Pregnancy Act, 1971
- d. The Equal Remuneration Act, 1976
- e. National Commission for Woman Act, 1990

4. New Ideas non- acceptance

Entrepreneurs are the one who believe in their vision and take risks. The myth in society that woman entrepreneurs

lack the ability, skills and knowledge of the business and hence, their ideas are not accepted by the society versus men who face less struggle in comparison to woman.

Solution

To bring the paradigm shift and help woman entrepreneurs ease their struggles. The following Government and non-governmental Schemes aided the process of removing obstacles in the way of woman entrepreneurs.

Governmental schemes

- Credit guarantee schemes new and existing MSME's
- Stand Up India (manufacturing, trading and services)
- Sustainable Finance Scheme
- Bank Credit Facilitation Scheme

Non-governmental schemes

- Saha fund (woman focused venture capital accepted by SEBI)
- Woman Entrepreneurs in India (to connect woman with abilities and skills)
- SonderConnect (is an organization dedicated to discovering, empowering and promote female Founders Globally)
- Womentum (is a pay it forward nonprofit crowd funding international platform for woman entrepreneurs in developing countries)

5. Work life balance

Married or unmarried, each have to face struggles in their own way. Unmarried woman

Encounter difficulty at workplace, have to face discrimination, mental harassment, job security issues and indecent behavior of the boss. On the other hand apart from facing the above issues a married woman also has to face additional problems of behavior of her husband and in-laws, problems of social relations, quarrels in family and taking care of children.

Solution

A woman has to find her own way out to maintain relationship at work and give time to the family. The following solutions can help her strike a proper work life balance.

- Flexible working hours
- Home based business
- Outsource task
- Following a consistent work schedule
- Network with professional associates
- Building support system by nurturing relationships

6. Training

Training is required to gain knowledge and abilities essential to fulfill the specific requirement of a skill related to a particular business. Woman entrepreneurs to start a business need to have the skills and expertise. Thus skills

can be gained when efforts are made to develop those skills. Development of the skills is possible only when the required and the relevant training is provided.

Solution

The government of India to encourage woman in rural and urban areas to be self-dependent and encourage the idea of entrepreneurship has laid down various programs and schemes to help woman build confidence.

- Skill India Mission, a mega drive initiated by the ministry of skill development and entrepreneurship through skill training
- Pradhan Mantri Kaushal Vikas Yojna (short term skill training program)
- National Skill Development Corporation (fee based training via wide networks)

7. Illiteracy

Illiteracy should be equated with ignorance because it brings about lack of awareness. Literacy does not only confide to academics, it is equated to continuous learning which brings about up gradation in knowledge and technology leading to improvement in all spheres. Thus, it is necessary for woman to be educated so that she is aware about the latest trends and copes up with the competition by making the optimum use of her knowledge which she obtained from being educated, because information cannot be converted into knowledge without education.

Solution

Education is the fundamental right of every citizen of India. Education develops personality and attitude and improves one's knowledge and skills. "If you educate a woman, you educate a family, if you educate a girl, you educate the future" -Queen Rania of Jordan. Realizing the importance of education for woman, Government schemes such as

- Sakshar Bharat Mission for female literacy.
- Kasturba Balika Vidyalaya (establishment of Residential upper primary Schools for girls)
- National Program for Education of Girls at Primary level
- Rastriya Madyamik Shiksha Abhiyan (hostel facilities for secondary education)

8. Safety and Security for woman

Women's safety is forever at stake Due to the increasing crime rates of domestic violence, dowry, acid attack, rapes, and sexual harassment it discourages other women's to even think before moving out of the house.

Solutions

- Nirbhaya Fund (safety and security of Woman)
- MHA has launched an online analytical tool for police on 19th February, 2019 called "investigation tracking system for sexual offences"

c. Emergency response Support System, which provides a single emergency number (112)

9. Glass Ceiling

Glass ceiling is an unacknowledged barrier to advancement in a profession, especially affecting women. Women are deliberately not allowed to move up the hierarchy after a certain point. Even if the woman is fully capable and has she required abilities men would be given preference over women. Thus, to prove her capabilities and talent and the urge to move up the career ladder she has to opt for becoming entrepreneurs.

Solution

Equality is the fundamental right the Indian constitution, Preamble and Directive principle focuses to treat men and women equally and to avoid discrimination between men and women To break the ceiling and encourage more women to showcase their talents and prove their worth in the society and to bring both men and women at power. Government schemes such as:

- National commission for woman act of parliament 1990 to safeguard the rights and legal entitlements
- 73rd and 74th amendment reservation of seats in local bodies' panchayats and municipalities for woman
- Human rights instruments committing to secure equal rights of woman, eliminating all forms of discrimination against woman (CEDAW) in 1993

10. Lack of Unity amongst oppressed woman

Women's usually do not bring their problem in open because of the fear of the society. There are many women's who face problems related to sexual harassment, dowry and rape cases. Due to this they face mental torture, depression and even commit suicide. The #METOO movement, was one of the social media movement which actually brought to notice the magnitude of sexual harassment and sexual assault cases in open.

Solution

Unity gives strengths to fight against evil doing, when women get united and stand together, this will help them fight against the wrong doing. There are many NGO's and organization which help woman fight against oppression. Some of the NGO's are mentioned below.

- Majlis Manch: Through their program 'Rahat', Majlis Manch's legal center provides socio-legal support to victims of domestic violence and sexual abuse.
- Meer Foundation: a non-profit organization in India, focuses on the rehabilitation of Acid Attack survivors under the work for Women Empowerment
- Jan Sahas Social Development: runs a programme to help rape survivors and their family.

Sr. No.	Entrepreneur	Marital Status	Education	Field	Struggles	Overcome
1	Sonia Ramasubbar (Founder of Fern Retail)	Married	B.Sc. Chemistry, MA in Communication	Pharma	Gender Inequality, Societal Pressure, Lack of family support, unavailability of raw material, shortage of working capital	Self-started, support from husband and brother
2	AAJ Thane (Founder of Mantraquill)	Married	Engineering Graduate	Healthcare	Work was criticized as women health issues are considered as taboo, societal pressure, creating awareness around the issues	Developed interventions, clear vision to educate the girl child, communication skills, leads to create awareness.
3	Neelima Latha (Founder of VLCC)	Married	Medical Graduate	Healthcare	Due to the marital discord, business idea was criticized, medical fraternity criticized, no capital	With life partner, support from husband, Motivation to buy the success from scratch
4	Aashita Arora (Founder of Social Harmonize Law Compliance Solutions)	Unmarried	Lawyer	Legal	No Self their internal capabilities	METOO movement helped her with the cause, Support from universities and friends
5	Rhea Meghade (Founder of Bazaar Limited)	Married	B.Sc. Zoology, Post-graduation from Maharashtra University	Pharma	Lack of funds, health did not provide her due to new concept, Lack of knowledge	Detail IPO, Global recognition for creating awareness, self-started
6	Thirika Chandel (Founder of Lakshmi Women Travel)	Married	B.A. in Arts, Courses in Microenterprises at Noida Institute of Management	Travel	Male dominance, Family disapproval for because of the perception that holding a job is not a woman's business	Company, International, father's support, Skills, Know many languages
7	Sita Sagar (Founder of Akaji Tailoring)	Unmarried	Arts and Crafts Institute in pune	Works	Family pressure to start a work, Lack of capital, Failure of business	Father's support, capital from her brother, Tailor established her to be better
8	Kalpana Bora (Founder of Kalpana) (Business of Retail concept)	Married	A Schooling	Retail	Menstrual at the age of 12 and divorce, Societal norms, Lack of education, Lack of capital	Support from her Mother and uncle
9	AAJ Ayath (Founder of Sushil)	Unmarried	Graduate from Thapar University/MSK Data Change	Education	Shiksha's deep technology platform, necessity to help was a challenge, Getting resources, shareholders and employees was a challenge	Wanted to be strong to educate India, Social investment for Kishor support and Lightbox, started Ayath's (Kishor) through 7th grade to 12th grade
10	Sita Laksh (Founder of Duggi)	Married	Diploma Graduate in cooking, 2 Part time courses (Dietician and teacher certificate)	Food	Failure to college, lack of financial capabilities	Acceptance of father, Relations with the society and strong family to succeed even her sister, financial support from mother

CONCLUSION

The study concludes that empowerment is crucial to accelerate woman entrepreneurship. Women are venturing in all sectors of enterprises, thus woman entrepreneurs are considered to be the most important economic agents for economic development of the country. Empowerment gives women the right to participate in society and economy in par with men.

We need to empower every oppressed so that they can be participant of our 5 trillion economy. On the basis of gender women are the most oppressed they can be uplifted and can become a major contributor for our country's growth. If the leader is chosen from the oppressed she will be the best

leader, because she has faced all the difficulties and then overcome it.

On the basis of above argument we can conclude that women entrepreneurship is the only way through which major population of the society i.e. Women can get employment and become a workforce that can force down the evil of poverty and pull up the economy of our country.

REFERENCES:

1. <https://wed.nic.in/schemes-listing/2405>
2. <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1578353>
3. <https://services.india.gov.in/service/detail/check-government-schemes-for-women>
4. Rahman Kazi(2015) "Status of Women in India in the Context of Inclusive Growth."IOSR Journal of Humanities and Social Science (IOSR-JHSS) Volume 20, Issue 4
5. Duflo E. (2011) Women's Empowerment and Economic Development, National Bureau of Economic Research, Cambridge
6. Government of India National family health survey (4), Ministry of health and family welfare, New Delhi
7. Neha Elizabeth(2015) "Empowering Women through Education with special reference to Indian economy." International Journal of Research in Management & Technology Vol. 5
8. <https://yourstory.com/category/women-entrepreneurs>
9. Connect the dots-Rashmi Bhansal
10. Follow every Rainbow-Rashmi Bhansal
11. Stay Hungry, Stay Foolish-Rashmi Bhansal

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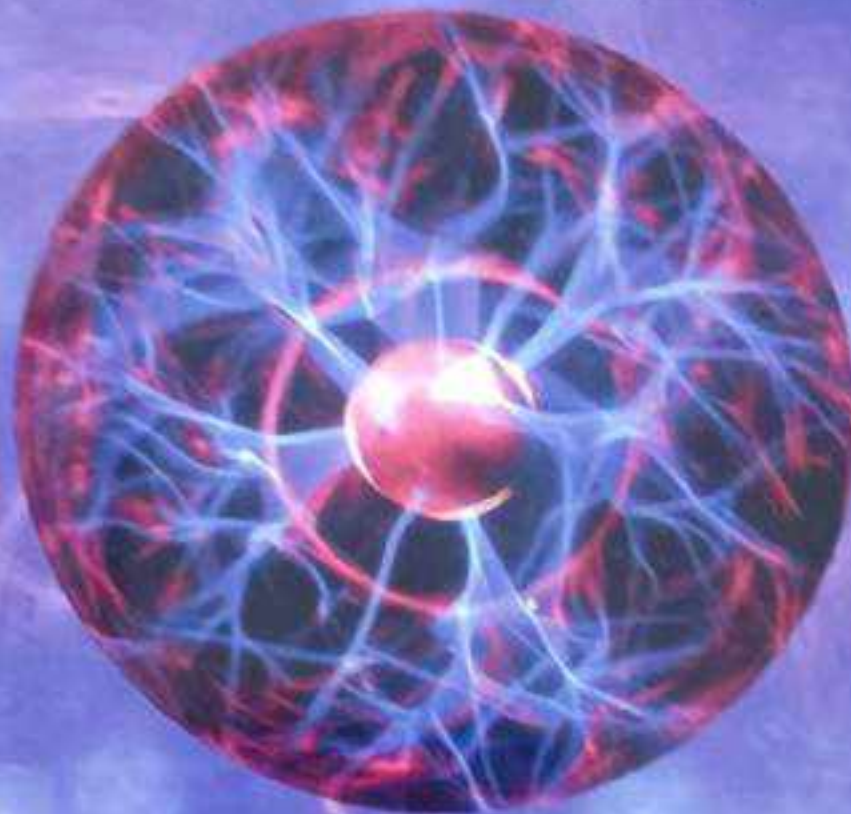


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Study on Social Maturity Level of Junior College Students and its Impact

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Abstract

The study has been conducted on a sample of 80 junior college students selected from Rizvi college of Arts, Science and Commerce, Bandra, Mumbai. A standardized tool of Social Maturity Scale, constructed by Nalini Rao was used which contains 90 items for measuring different aspect of Social maturity. The respondents were required to indicate their view on four point scale i.e. Strongly Agree, Agree, Disagree and Strongly Disagree. The findings shows that the social maturity score of F.Y.J.C students is more than S.Y.J.C students. The level of social maturity of male students is little higher than female students. The level of social maturity of Marathi medium students is highest. The level of social maturity of English medium school students is lowest.

Social maturity involves learning to properly relate to acquaintances, family, neighbors, friends, and relationships; involves understanding how to honor and respect those in authority. It means knowing what to do and striving for it to reach the desired level of acceptable social behavior. Social maturity is a long process to be socially mature. It is process of proper attitude or behavior of an individual which is essential for functioning effectively in the society.

Keywords: Social Maturity, Personal Adequacy, Interpersonal Adequacy, Social Adequacy.

Introduction

Social maturity involves learning to properly relate to acquaintances, family, neighbors, friends, and relationships. It involves understanding how to honor and respect those in authority. It means knowing what to do and striving for it to reach the desired level of acceptable social behavior. Social maturity is a long process to be socially mature. It is process of proper attitude or behavior of an individual which is essential for functioning effectively in the society.

The Nature of Social Maturity

The maturity of a student is influenced by various social factors as under:

(i) **Concept of dependence:** Independence: An individual is required to modify his behavior in terms of asserting his

independence and seeking aid or relief in the socio cultural context.

(ii) **Self Control:** Self-control as a part of social maturity is necessary for decision making and facing its consequences. Acquiring self-control is partly maturational and partly learnt behavior. The student studying in a secondary school understands that society does not expect him to regress to childhood behavior at this age so he attempts at coming up to the expectations of the society and this he achieves by controlling his behavior.

(iii) **Stress:** Everybody has to overcome stress. Even when there comes stress situation. A mature individual mobilizes the available resources and utilize them to the best of his ability to overcome the stress.

(iv) **Social maturation:** Socially mature are aware of their

Interpretation: The mean of Social Maturity of students who completed their schooling from English medium is 239.1111, students who completed their schooling from Marathi medium is 249.25, students who completed their schooling from Urdu medium is 228.3846 and students who completed their schooling from Hindi medium is 236.

Discussion: The level of social maturity of Marathi medium is highest. The level of social maturity of Hindi medium school is lowest. This may be because Marathi medium students make more friends and participate in activities.

Major Findings and Discussion

After processing the data, obtaining and interpreting the results, the findings have been discussed below. These findings can be generalized to the extent of representativeness of the sample and methodology employed in the study.

It is devoted to focusing the findings, conclusions, discussion of results of this study and for indicating their implications and suggestions for further studies or research.

- The social maturity score of F.Y.J.C students is more than S.Y.J.C students. This may be because S.Y.J.C students are more involved in studies other than social activities of the college.
- The level of social maturity of males is little higher than females. This may be because males are often socially involved. Females are less involved with others.
- The level of social maturity of Marathi medium is highest. The level of social maturity of Hindi medium school is lowest. This may be because Marathi medium students make more friends and participate in activities.

Educational Implications

Social Maturity among adolescents in the age group of 17-18 plays a very important role in their life. Though the present study was restricted to only a number of 80 students of Mumbai, its findings have important educational implications for parents, teachers, counselors, administrators etc. Parents at home and teachers at school always play a major role in influencing and developing social maturity. They may channelize an adolescent's energy into constructive dimension. By encouraging students to work to the best of their ability and by being genuinely interested in their progress, teachers can enhance the self-esteem of students, regardless of their talent. Parents can do the same and by encouraging their children to participate in extracurricular activities that match their talent, further promote self-esteem. The teacher should

engage class in a good debate. Students should learn in group discussions. Students should be involved in activities that enhance the ability to think with maturity. The present study has given a clear picture of the current situation to help and identify the factors responsible for creating problems in the life of adolescents and how they can be helped.

Summary And Conclusion

The ultimate aim of effective social development is the attainment of social maturity. A social mature adult shows a few important characteristics. He is able to adapt himself successfully to his fellowmen and to adapt his fellowmen to himself. It includes such behavioral forms as group compatibility, kindness and sympathy, fair play emotional adjustability, courtesy and politeness, dependability, self-confidence, co-operation, leadership and cheerfulness.

A socially mature individual should be able to make judgments, decisions and take proper action in face of problems and critical issues. He should be able to participate in cooperative activities without conflict with others. He is capable of taking responsibility for his own actions, and of making and keeping a large number of friends. He has a well-balanced and objective estimate of himself and can take on himself different roles in accordance with the demand of different situations. He identifies with the interests of the group and puts the group benefits before his selfish gains.

REFERENCES:

1. Shodhganga-chapter 5 summary and conclusion "A study of social maturity, self-control and adjustment of higher secondary school students".
2. "Brief notes on the concept of Social Maturity" article by Tanvi Jain.
3. Tripathy Manoranjan, International Journal of Advance Research, Ideas and Innovations in Technology.
4. Mishra Astha, Dubey Seema and Kumari Mamta (2017)- "A study on social maturity of adolescent in sultanpur city", International Journal of Home Science.
5. P. Anitha, A. Umesh Samuel Jebaseelan- "Study on Social maturity of the Adolescent College Students in Colleges at Tiruchirappalli".
6. Dr. Vipendra Nagra, Ms Maninder Kaur (2013) - "Social Maturity among Student Teachers", International Journal of Education and Psychological Research.

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A Study on Impact of Empowerment on Woman Entrepreneurs in India

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Abstract

A powerless needs and struggles for power so that one can become so empowered that one can enjoy the upper strata status. Similarly, same fundamental can be applied in entrepreneurship where one upgrades oneself from being employee to employer.

We can clearly see that there is an up gradation from powerless to empower or from job seeker to job giver. I.e. an entrepreneur. This differentiation between the two i.e. (i) empowerment and (ii) entrepreneur can be seen across the globe with different intensity. This differentiation is amongst various religion, culture, race and religion.

But one thing is common amongst above demographical component is power differentiation between male and female, which also creates base for differential rate of entrepreneurship between males and females. LGBTQ community is also our societal part but they are still in a phase of recognition. Thus to rule out this difference, need for woman empowerment for woman entrepreneurship is required.

Empowerment is nothing but, a process of becoming stronger and more confident especially in controlling one's life and clamming one's rights. Whereas, woman entrepreneurship is a process in which woman initiates a business, gathers all resources, undertakes risks, faces challenges and provides employment to others and manages the business. But, due to family and societal pressure gender discrimination and stereotypical patriarchal society she is suppressed and unable to display her knowledge, skills and abilities. Thus, to showcase her talents and abilities empowerment is required.

With the help of descriptive research, we will examine various eminent woman entrepreneurs' struggles and problems they faced. Find out the results of how they overcame the challenges by making use of the available situational opportunities and made their essential contribution to achieve the goal of 5 trillion economies.

Keywords: *woman entrepreneurs, empowerment, challenges, opportunities*

Introduction

Women are an important section of the society, hence empowering woman to be an entrepreneur is essential for the socio-economic and political progress of India as 1/3rd of the budding entrepreneurs in India are woman which contribute to a major share in achieving India's 5 trillion economy. Due to male dominance it is nearly impossible for them to reach their goal. Thus, to remove the gender biasness and to create neutrality between men and woman giving power to woman is the need of the hour to treat them in level with men. For woman to achieve their vision and have faith in it, determination, believe in one's ideas, skills and abilities are required and this is possible only when woman are being empowered. Woman entrepreneurs face

various hurdles and barriers which are pulling them back in achieving their dream.

Review of Literature

This literature states the areas where woman empowerment relevant issues have already being articulated.

Dufflo E. (2011) states the weak relationship between Empowerment and *Development*. It further states that to improve the prevailing condition and better the situation it is essential to be self-sustaining and continuous policy development is essential to bring about gender neutrality and treat men and woman equally.

H. Subrahmanyam (2011) states *education* is an essential part in woman empowerment; it gives woman the knowledge and creates awareness amongst them. A brief

comparison was made between the past and present rate of education, which significantly showed a drastic improvement in the enrollment rate of girls in the field of education in urban rural areas.

Venkata Ravi and Venkatraman (2005) focused on empowerment of woman entrepreneurs through SHG helped woman to maintain work life balance and to control both family matters and career.

Nayyar et al (2007) focused on the *qualities and skills* essential for woman to be successful entrepreneurs. Further studied the work life balance is essential to maintain both career and personal life.

Mathew and Panchanatham (2011) focused on the role conflict, quality of health, problems in time management, no social support are major hindrances and obstacles of woman on the part of becoming successful entrepreneurs and how the overcome the hurdles are discussed.

Objectives of the Study

1. To identify the challenges and obstacles in the path of woman entrepreneurs.
2. To know the implication of various government schemes for woman empowerment.
3. To know the importance of woman empowerment for woman entrepreneurs
4. To identify the path through which woman becomes a major contributor towards achieving the 5 trillion economic growth.

Research Methodology

The type of research used is descriptive research. 10 woman entrepreneurs are studied across various sectors their challenges and obstacles in the way of becoming entrepreneurs are analyzed.

Data is sourced through secondary data which includes journals, research papers and management books. The objective of the study is to analyze the obstacles faced by woman entrepreneurs and provide a solution for the by studying the implication of various government schemes.

Problems Faced By Woman Entrepreneurs

After analyzing the few woman entrepreneurs, the following were the major obstacle which caused a major hurdle in the path of entrepreneurship

1. Funding

Initial investment, raising capital and getting loans from the banks is always difficult for woman in comparison to man. The major reason being the credit worthiness of a woman, this is due to the perception that woman's leave the business anytime.

Solution

The problem of funding arises as there is always a trust issue

with woman entrepreneurs because their skills are doubted and knowledge of the business is suspected. Hence, to eradicate these issues as a mean of obstacle in the path of woman entrepreneur's government of India has come up with the following schemes to help budding woman entrepreneurs overcome the challenges of funding.

- a. Mudra Yojna Scheme
- b. TREAD (Trade Related Entrepreneurship Assistance)
- c. Mahila Udyam Nidhi Scheme
- d. Annapura Scheme
- e. Stree Shakti Package for Woman Entrepreneur

2. Societal Pressure

In Indian Society males are always given an upper hand and considered superior over woman, thus males do not encourage females to be entrepreneurs and more successful over them due to ego issues. Due to this pattern, many restriction are made on woman which are created by the society. Woman earning money had become a societal stigma. There is no family support, woman are expected to spend more time with the family, there is role conflict which she is supposed to address.

Solution

The Government of India has made many provisions for woman entrepreneurs to build their trust and self-confidence and be in equal power with men. Few initiatives by the Government to support woman entrepreneurs in both rural and urban areas.

- a. Mahila Shakti Kendra-Rural Woman empowerment
- b. Pradhan Mantri Matritva Vandana Yojna- For mothers.
- c. Priyadarshini-Self Help Group
- d. Rajiv Gandhi scheme-for Adolescence girls
- e. Sunkanya Samridhni Yojna-Saving Schemes for girls.

3. Patriarchal Society

Patriarchy imposes masculinity and feminists character stereotypes in the society which creates inequalities of power between men and women. Woman are considered as Paraya Dhan (liability) thus, denied rights, treated unfairly, and unequally which eventually gives rise to dowry system which is illegal in India yet still in practice.

Solution

To curb patriarchy system and to promote gender equality government of India has made some provisions:

- a. The Dowry prohibition Act, 1961
- b. The Maternity Benefit Act, 1961
- c. The Pregnancy Act, 1971
- d. The Equal Remuneration Act, 1976
- e. National Commission for Woman Act, 1990

4. New Ideas non- acceptance

Entrepreneurs are the one who believe in their vision and take risks. The myth in society that woman entrepreneurs

lack the ability, skills and knowledge of the business and hence, their ideas are not accepted by the society versus men who face less struggle in comparison to woman.

Solution

To bring the paradigm shift and help woman entrepreneurs ease their struggles. The following Government and non-governmental Schemes aided the process of removing obstacles in the way of woman entrepreneurs.

Governmental schemes

- Credit guarantee schemes new and existing MSME's
- Stand Up India (manufacturing, trading and services)
- Sustainable Finance Scheme
- Bank Credit Facilitation Scheme

Non-governmental schemes

- Saha fund (woman focused venture capital accepted by SEBI)
- Woman Entrepreneurs in India (to connect woman with abilities and skills)
- SonderConnect (is an organization dedicated to discovering, empowering and promote female Founders Globally)
- Womentum (is a pay it forward nonprofit crowd funding international platform for woman entrepreneurs in developing countries)

5. Work life balance

Married or unmarried, each have to face struggles in their own way. Unmarried woman

Encounter difficulty at workplace, have to face discrimination, mental harassment, job security issues and indecent behavior of the boss. On the other hand apart from facing the above issues a married woman also has to face additional problems of behavior of her husband and in-laws, problems of social relations, quarrels in family and taking care of children.

Solution

A woman has to find her own way out to maintain relationship at work and give time to the family. The following solutions can help her strike a proper work life balance.

- Flexible working hours
- Home based business
- Outsource task
- Following a consistent work schedule
- Network with professional associates
- Building support system by nurturing relationships

6. Training

Training is required to gain knowledge and abilities essential to fulfill the specific requirement of a skill related to a particular business. Woman entrepreneurs to start a business need to have the skills and expertise. Thus skills

can be gained when efforts are made to develop those skills. Development of the skills is possible only when the required and the relevant training is provided.

Solution

The government of India to encourage woman in rural and urban areas to be self-dependent and encourage the idea of entrepreneurship has laid down various programs and schemes to help woman build confidence.

- Skill India Mission, a mega drive initiated by the ministry of skill development and entrepreneurship through skill training
- Pradhan Mantri Kaushal Vikas Yojna (short term skill training program)
- National Skill Development Corporation (fee based training via wide networks)

7. Illiteracy

Illiteracy should be equated with ignorance because it brings about lack of awareness. Literacy does not only confide to academics, it is equated to continuous learning which brings about up gradation in knowledge and technology leading to improvement in all spheres. Thus, it is necessary for woman to be educated so that she is aware about the latest trends and copes up with the competition by making the optimum use of her knowledge which she obtained from being educated, because information cannot be converted into knowledge without education.

Solution

Education is the fundamental right of every citizen of India. Education develops personality and attitude and improves one's knowledge and skills. "If you educate a woman, you educate a family, if you educate a girl, you educate the future" -Queen Rania of Jordan. Realizing the importance of education for woman, Government schemes such as

- Sakshar Bharat Mission for female literacy.
- Kasturba Balika Vidyalaya (establishment of Residential upper primary Schools for girls)
- National Program for Education of Girls at Primary level
- Rastriya Madyamik Shiksha Abhiyan (hostel facilities for secondary education)

8. Safety and Security for woman

Women's safety is forever at stake Due to the increasing crime rates of domestic violence, dowry, acid attack, rapes, and sexual harassment it discourages other women's to even think before moving out of the house.

Solutions

- Nirbhaya Fund (safety and security of Woman)
- MHA has launched an online analytical tool for police on 19th February, 2019 called "investigation tracking system for sexual offences"

c. Emergency response Support System, which provides a single emergency number (112)

9. Glass Ceiling

Glass ceiling is an unacknowledged barrier to advancement in a profession, especially affecting women. Women are deliberately not allowed to move up the hierarchy after a certain point. Even if the woman is fully capable and has she required abilities men would be given preference over women. Thus, to prove her capabilities and talent and the urge to move up the career ladder she has to opt for becoming entrepreneurs.

Solution

Equality is the fundamental right the Indian constitution, Preamble and Directive principle focuses to treat men and women equally and to avoid discrimination between men and women To break the ceiling and encourage more women to showcase their talents and prove their worth in the society and to bring both men and women at power. Government schemes such as:

- National commission for woman act of parliament 1990 to safeguard the rights and legal entitlements
- 73rd and 74th amendment reservation of seats in local bodies' panchayats and municipalities for woman
- Human rights instruments committing to secure equal rights of woman, eliminating all forms of discrimination against woman (CEDAW) in 1993

10. Lack of Unity amongst oppressed woman

Women's usually do not bring their problem in open because of the fear of the society. There are many women's who face problems related to sexual harassment, dowry and rape cases. Due to this they face mental torture, depression and even commit suicide. The #METOO movement, was one of the social media movement which actually brought to notice the magnitude of sexual harassment and sexual assault cases in open.

Solution

Unity gives strengths to fight against evil doing, when women get united and stand together, this will help them fight against the wrong doing. There are many NGO's and organization which help woman fight against oppression. Some of the NGO's are mentioned below.

- Majlis Manch: Through their program 'Rahat', Majlis Manch's legal center provides socio-legal support to victims of domestic violence and sexual abuse.
- Meer Foundation: a non-profit organization in India, focuses on the rehabilitation of Acid Attack survivors under the work for Women Empowerment
- Jan Sahas Social Development: runs a programme to help rape survivors and their family.

Sl. No.	Entrepreneur	Marital Status	Education	Field	Struggles	Overcome
1	Sonia Ramasidha (Founder of Fern Beauty)	Married	B.Sc. Chemistry, MA in Communication	Fashion	Gender Inequality, Societal Pressure, Lack of family support, unavailability of raw material, shortage of working capital	Self-started, support from husband and brother
2	AAJ Thane (Founder of Mantraquill)	Married	Engineering Graduate	Handloom	Work was criticized as women handloom weavers are considered as labor, societal pressure, creating awareness around the issues	Developed strategies, clear vision to educate the govt. child, communication skills, leads to create awareness.
3	Neelima Latha (Founder of VLCC)	Married	Medical Graduate	Healthcare	Due to the unusual concept, business idea was criticized, medical faculty criticized, no capital	With life balance, advice from husband, Motivation to buy the success from health
4	Aashita Anar (Founder of Social Harmonize Law Compliance Solutions)	Unmarried	Lawyer	Legal	No Self their internal capabilities	METOO movement helped her with the cause, Support from universities and friends
5	Rhea Meghade (Founder of Bazaar Limited)	Married	B.Sc. Zoology, Post-graduation from Maharashtra University	Fashion	Lack of funds, family did not provide loan due to new concept, Lack of knowledge	Detail IPO, Global recognition for creating awareness, self-started
6	Thirika Chandel (Founder of Lakshmi Women Travel)	Married	B.A. in Arts, Courses in Microenterprises at Noida Institute of Management	Travel	Male dominance, Family disapproval for because of the perception that holding a job is not a woman's business	Company, International, father's support, Skills, Know many languages
7	Sita Sagar (Founder of Akshay Tiffin)	Unmarried	Arts and Crafts, diploma in jewelry making	Works	Family pressure to start a work, Lack of capital, Failure of husband	Father's support, capital from her, T.V. channel, established her to be better
8	Kalpana Devi (Founder of Kalpana) (Survivor of Kamasu) (Kamasu survivor)	Married	A Schooling	Real	Married at the age of 13 and divorced, Societal norms, Lack of education, Lack of capital	Support from her Mother and uncle
9	AAJ Ayushi (Founder of Sahib)	Unmarried	Graduate from Thapar University/MBA from Chicago	Education	Shiksha's deep technology platform, necessary to build was a challenge, Getting investors, shareholders and employees was a challenge	Wanted to be strong to educate India, Social investment for Kamasu support and Lightbox, started Ayushi's (KAS) through 7th grade in India
10	Sita Lakshmi (Founder of Duggi)	Married	Diploma Graduate, an artist, 2 Part time courses, teacher, decorator	Textile	Failure to college, lack of financial, competition	Acceptance of father, Relations with the society and strong family to succeed even her sister, financial support from mother

CONCLUSION

The study concludes that empowerment is crucial to accelerate woman entrepreneurship. Women are venturing in all sectors of enterprises, thus woman entrepreneurs are considered to be the most important economic agents for economic development of the country. Empowerment gives women the right to participate in society and economy in par with men.

We need to empower every oppressed so that they can be participant of our 5 trillion economy. On the basis of gender women are the most oppressed they can be uplifted and can become a major contributor for our country's growth. If the leader is chosen from the oppressed she will be the best

leader, because she has faced all the difficulties and then overcome it.

On the basis of above argument we can conclude that women entrepreneurship is the only way through which major population of the society i.e. Women can get employment and become a workforce that can force down the evil of poverty and pull up the economy of our country.

REFERENCES:

1. <https://wed.nic.in/schemes-listing/2405>
2. <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1578353>
3. <https://services.india.gov.in/service/detail/check-government-schemes-for-women>
4. Rahman Kazi(2015) "Status of Women in India in the Context of Inclusive Growth."IOSR Journal of Humanities and Social Science (IOSR-JHSS) Volume 20, Issue 4
5. Duflo E. (2011) Women's Empowerment and Economic Development, National Bureau of Economic Research, Cambridge
6. Government of India National family health survey (4), Ministry of health and family welfare, New Delhi
7. Neha Elizabeth(2015) "Empowering Women through Education with special reference to Indian economy." International Journal of Research in Management & Technology Vol. 5
8. <https://yourstory.com/category/women-entrepreneurs>
9. Connect the dots-Rashmi Bhansal
10. Follow every Rainbow-Rashmi Bhansal
11. Stay Hungry, Stay Foolish-Rashmi Bhansal

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Effect of chromium on basic growth factors of *Pennisetum glaucum* L.

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Abstract: One of the main concerns of agricultural production is heavy metal pollutants. The industrialization has resulted in the heavy metal contamination of agricultural soil and ecosystems. Metals are a natural component of the earth, it is when their concentration increases from natural levels, ecological deterioration occurs. In the present study, transplant experiments were conducted to evaluate the effect of chromium-contaminated soil in *Pennisetum glaucum* L. The seeds growing in petridishes were exposed to chromium, in increasing concentrations of 1, 3, 5, 10, 50, 100, 200, 300, 500 ppm. Each treatment was replicated in a randomized design and observed over a period of 7 days. The seedlings were studied for their response based on germination rate, seed vigour index, length of the radicle, length of plumule, and fresh weight against seeds germinated using distilled water as a control. Five different chromium concentrations i.e., 5, 10, 50, 100 & 200 ppm, were applied to the plants. Each treatment was replicated in a randomized design and observed for 45 days. The plants were studied for the length of root, length of shoot, fresh weight, total chlorophyll content, protein content, and heavy metal analysis compared to a set irrigated using distilled water as a control. The root and shoot lengths decreased with an increase in Cr concentrations in the transplants. A gradual decrease was observed in the selected parameters, with an increase in Cr levels. The values related well with increased Phyto-accumulation of chromium within the tissues of both roots and shoots. It was observed that chromium's harmful effects on all the parameters were directly proportional to the concentration of solution employed, with the inhibition of growth being more pronounced from 50 ppm onwards. As *Pennisetum glaucum* L. an edible crop despite showing a good potential for application in phytoremediation techniques, it can't be used to hyper accumulate chromium to remove it from the soil.

Keywords: Chromium; germination; transplants; toxicity; phytoremediation; *Pennisetum glaucum* L.

Introduction

The term heavy metal denotes metals whose density is higher than 4 g/cm³. (Hawkes, 1997) Industrial development and urbanization have raised metals in soil, aquatic ecosystems, and the atmosphere. Some of these essential trace metals like zinc & copper act as activators of enzymatic reactions, forming metal substrate complexes (Mildvan, 1970). However, these essential metals are considered toxic when present in excessive amounts (Blay lock and Huang, 2000). A number of other heavy metals such as Cd, Hg, Cr, and As are toxic, leading to growth inhibition and death. Iron is also one of the heavy metals essential for plants and animals (Wintz *et al.* 2002). Heavy metals have been discussed to cause oxidative stress by

catalyzing the formation of OH free radicals. (Fryzova R. *et al.* 2017).

Recent concerns regarding environmental pollution have given rise to developing various technologies to clean up the environment. Conventional methods of remediation and chemical methods are costly and do not produce optimum results. One of the emerging techniques to clean up contaminated soil and water is phytoremediation. This method has been eco-friendly, affordable, and an effective solution to remove heavy metal pollutants from contaminated soil. Hyper-accumulator plants have been reported to concentrate more than 10 mg/kg of mercury (Hg), 100 mg/kg of cadmium (Cd), 1000 mg/kg of cobalt (Co),

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chromium (Cr), copper (Cu), and lead (Pb), 10000 mg/kg of zinc (Zn) and nickel (Ni) (Baker and Brooks, 1989). Based on the environmental monitoring reports, edible crops grown in these contaminated soils to accumulate metals in quantities higher than permissible limits and are capable of causing health problems in animals and human beings consuming these plants (Tiller, 1986).

Several researchers have experimented with and reported the accumulation and uptake of chromium by various crops, *Arachis hypogaea* and *Cicer arietenum* (Imam Khasim D. *et al.* 1994); *Ablemoschus esculentum* (Jasuja K. *et al.* 1997). Jayaprakash *et al.* 1994 reported chromium's effect on chromosomal aberration and reduced mitotic activity in *Allium cepa*. Purohit *et al.* 2003 reported a reduction in the length of root and shoot and decreased biomass in *Solanum melongena* and *Solanum lycopersicum* upon being treated with increasing chromium concentration.

The traditional method of heavy metal stabilization in the soil is excavation and removal, it is known to be disruptive to the environment and presents us with a problem of generated waste and is an expensive process. Another viable alternative is soil amendments in-situ to decrease the bioavailability of heavy metals, it is a less disruptive and cost-effective alternative. Recently phytostabilization of heavy metal contaminated land has emerged as a low-cost and environment-friendly alternative to traditional remediation techniques. Phytovolatilization, sequestration, microbial extraction are some of the methods employed in phytoremediation.

Chromium (Cr) - Selected heavy metals as a contaminant

Chromium is a natural element in the soil, yet the increasing concentration makes it a potential toxin. In low doses, it is considered a necessary element in human and animal

nutrition, however, large quantities have been known to cause devastating effects on humans, animals, and plants. Cr³⁺ is one of the elements essential in low concentrations for human health, but long-term exposure to it has been reported to cause dermatitis, shortness of breath, ulceration of septum, bronchitis, pneumonia, and pulmonary problems, kidney disorders, weakened immunity, and may cause cancer.

Studies have suggested that chromium acts as a stimulant for plant growth, but certain studies have shown otherwise that it does more harm than good, posing more of a health concern in modern times due to industrialization. The problem of soil pollution due to industrial advancement has become a severe threat in India. Effluents from distilleries, electroplating plants, fertilizer and pesticide units, steel and paper industries, pharmaceuticals, petrochemical, oil refineries, thermal power plants, textile, tannery and dye industries are a source of pollutants with chromium.

Large amounts of chromium have been found in agricultural soils due to organic waste as fertilizers and wastewater for irrigation. Chromium does not degrade biologically and will remain stable for several months in the soil without changing its oxidation state. Chromium exists in several oxidation states, but the most stable and common forms are Cr (0), the trivalent Cr³⁺, and the hexavalent Cr⁶⁺ species. The valency of chromium plays an important role in determining its toxicity, Cr⁶⁺ is highly toxic and soluble compared to Cr³⁺ as it cannot quickly transfer across cell membranes (Mertz, 1992). Phytotoxic symptoms include inhibition of seed germination, reduced root, shoot growth, and adverse effects on physiological processes. Higher concentrations of chromium also produce an adverse effect on several physiological parameters such as

reduction of the rate of photosynthesis, impairment of mineral nutrition (Sundara Moorthy, *et al.* 2010), causing oxidative stress (Shanker *et al.* 2005), leaf chlorosis, and depressed biomass (Sharma *et al.* 1995) ultimately leading to loss of plant life. Cr^{3+} is considered a micronutrient in humans, being necessary for sugar and lipid metabolism (Agency for Toxic Substances and Disease Registry, 2000) instead of Cr^{6+} , which is considered a carcinogen and can enter the human body through consumption of contaminated plant material. The Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, 2007, recommends soil should contain less than 64mg/kg of total chromium and 0.4mg/kg of the form hexavalent chromium. The permissible limit of chromium for plants is 1.30mg/kg recommended by WHO.

Chromium (Cr) has been selected as a test metal since it has been employed in the leather industry, steel, and chemicals, to name a few. Since the effects and uptake of Cr^{6+} on *Pennisetum glaucum* L. have not been extensively studied yet; the present study was conducted to understand the Cr^{6+} toxicity by observing the morphological and physiological responses stress. Therefore, our study focuses on chromium's role in plant growth, emphasizing that *Pennisetum glaucum* L. as a potential candidate for phytoremediation of chromium from contaminated sites.

Material and Methods

A) Plants Selected: The seeds of *Pennisetum glaucum* L. were purchased from a local seed dealer.

B) Heavy metal treatment:

A 1000 ppm stock solution was prepared for the selected heavy metal. This was then diluted to prepare 1, 3, 5, 10, 50, 100, 200, 300, 500 ppm to treat seeds. All the standards were prepared by non - serial dilutions.

Chromium - Accurately weighed 2.828 g of 99.9 % of analytical grade Potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$) in 1000 mL of distilled water.

C) Experimental studies:

Ten surface-sterilized seeds of each species uniform in color, weight, and size were selected and individually placed in a Petri dish of 9 cm diameter on double-layered filter paper. The filter paper was moistened with varying concentrations of heavy metal solutions with 5 ml on the first day, followed by 2 ml on alternate days for 7 days or depending on the moisture every day. Each experiment's triplicates were studied in a completely randomized design and a separate control series using distilled water. Plants of *Pennisetum glaucum* L. were grown in bags filled with garden soil using cuttings after 15 days of growth. One sapling was grown in each bag, and each treatment was replicated in a randomized design. Normal growth conditions were provided to all the plants for their growth. The plants were grown for 15 days before treatment application and continued for 45 days after treatment application of 5, 10, 50, 100, 200 ppm i.e. before harvest.

D) Selection of plant parameters:

Following morphological characters were noted: Length of the root (cm), length of the shoot (cm), and fresh weight (g) of the plants after 45 days using a centimeter-scale and a digital balance. Biochemical tests were performed for recording the Chlorophyll Content - (Arnon's Method, 1949), Total Protein Content - (Lowry's Method, 1951), and Heavy Metal Analysis for chromium was done on the Inductive Coupling Plasma Atomic Absorption Spectroscopy (ICP - AAS) facility.

E) Statistical analysis:

To determine the significance between samples, a "Student's t - test" was carried out at $p < 0.05$ level of significance. The data were analyzed using analysis of variance (ANOVA). Box and

Whiskers plot, along with histograms, were used for data analysis. Statistical analysis was carried out using SPSS software version 11.0.

Result and Discussion

Effect of Chromium on Total Germination (%)

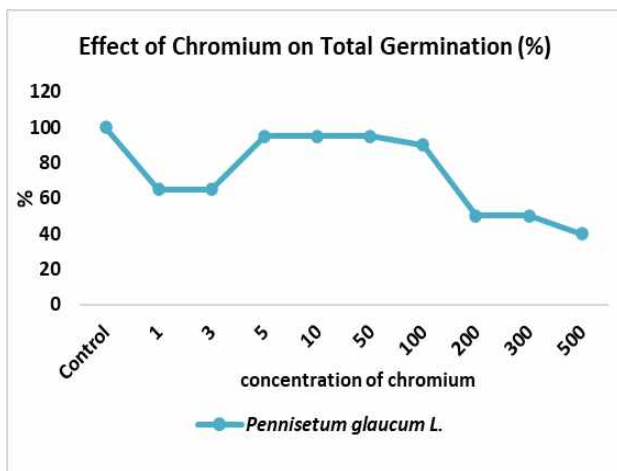
The present study showed a trend that higher chromium concentrations affected the plants' germination (Table 1, Figure 1). The total germination of the selected plants subjected to the highest chromium concentrations showed a significant difference compared to control. *Pennisetum glaucum* L. showed 90% at 100 ppm, and the least was 40% observed at 500 ppm.

Table 1. Effect of Chromium on Total Germination (%)

Ppm	<i>Pennisetum glaucum</i> L.
Control	100
1	65
3	65
5	95
10	95
50	95
100	90
200	50
300	50
500	40

values are an average of 30 samples.

Figure 1. Trend graph showing the effect of chromium on total germination (%)



Effect of Chromium on the Length of Radicle

Table 2. Effect of Chromium on Length of Radicle (cm)

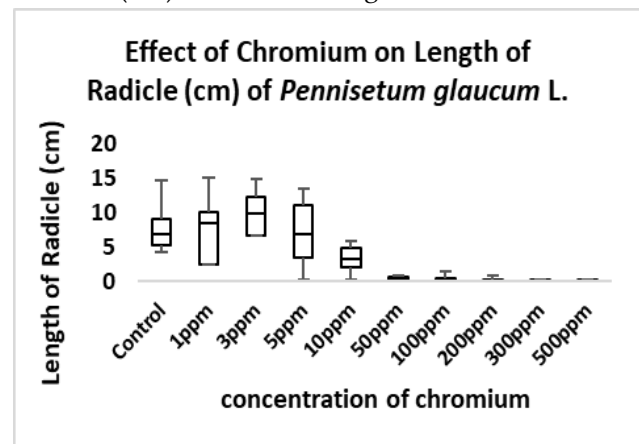
Ppm	Length of radicle	Length of plumule	Fresh weight
Control	7.63±3.10	5.95±1.10	0.0663±0.01
1	7.47±3.45**	3.98±1.74*	0.0642±0.02**
3	9.89±2.75#	5.13±1.29*	0.0462±0.01*
5	7.12±3.84**	4.58±1.29#	0.0629±0.03#
10	3.30±1.66*	4.91±1.19*	0.0444±0.01**
50	0.41±0.26*	2.96±1.67*	0.0321±0.01**
100	0.32±0.32*	2.4±1.07*	0.0296±0.01**
200	0.17±0.18*	1.27±0.72*	0.0199±0.00#
300	0.14±0.60*	0.94±0.40*	0.0178±0.00*
500	0.13±0.05*	0.49±0.46*	0.0141±0.00*

*significant at p < .01 ** not significant at p < .05

#significant at p < .05 values are average of 30 samples

Pennisetum glaucum L.: The length of the control value was 7.63 cm. The highest length was 9.89 cm at 3 ppm and 0.13cm at 500ppm. (Fig. 2)

Figure 2. Effect of Chromium on Length of Radicle (cm) of *Pennisetum glaucum* L.



Effect of Chromium on Length of Plumule

Table 3. Effect of Chromium on Length of Plumule (cm)

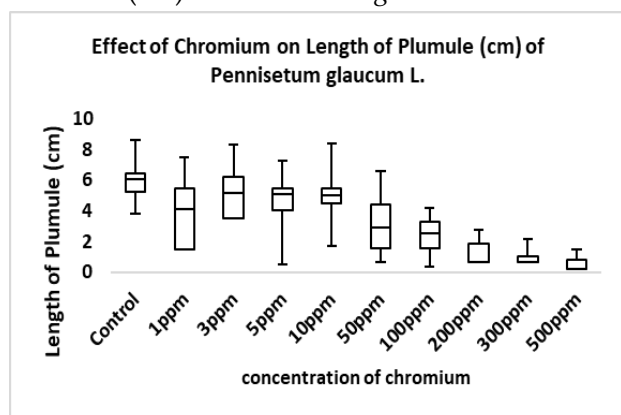
Ppm	<i>Pennisetum glaucum</i> L.
Control	5.95±1.10
1	3.98±1.74*
3	5.13±1.29*
5	4.58±1.29#
10	4.91±1.19*
50	2.96±1.67*
100	2.4±1.07*

200	1.27±0.72*
300	0.94±0.40*
500	0.49±0.46*

*significant at p < .01 ** not significant at p < .05
#significant at p < .05 values are average of 30 samples.

Pennisetum glaucum L.: Seedlings had a maximum value of 5.13cm length of plumule at 3 ppm and the lowest average length of plumule of 0.49cm at 500ppm. 5ppm and 10ppm concentrations also showed a length of 4.91cm and 4.98cm. The control values were 5.95 cm. (Fig 3)

Figure 3. Effect of Chromium on Length of Plumule (cm) of *Pennisetum glaucum L.*



Effect of Chromium on Fresh weight

Table 4. Effect of Chromium on Fresh weight (g)

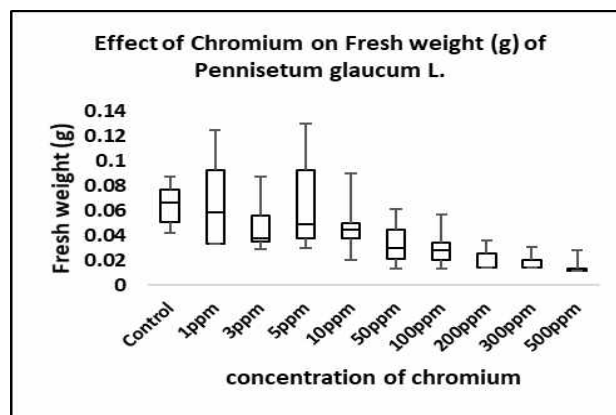
Ppm	<i>Pennisetum glaucum L.</i>
Control	0.0663±0.01
1	0.0642±0.02**
3	0.0462±0.01*
5	0.0629±0.03#
10	0.0444±0.01**
50	0.0321±0.01**
100	0.0296±0.01**
200	0.0199±0.00#
300	0.0178±0.00*
500	0.0141±0.00*

*significant at p < .01 ** not significant at p < .05
#significant at p < .05 values are average of 30 samples

Pennisetum glaucum L.: The lowest values of fresh weight were recorded in *Pennisetum glaucum L.* plants. Maximum fresh weight of

0.0663g for control followed by 0.0642g was noted at 1ppm and 0.0141g was the lowest average fresh weight at 500ppm. (Fig 4)

Figure 4. Effect of Chromium on Fresh weight (g) of *Pennisetum glaucum L.*



Effect of Chromium on Seed Vigour Index (SVI)

Based on the collective data of the total germination percentage and early seedling growth, which shows a decline in the overall length of radicle, plumule, and fresh weight, the SVI also follows a similar trend for the selected plant. All the plants showed a significant drop in SVI with an increasing concentration of chromium. *Pennisetum glaucum L.* recorded a drop in vigor from 1111.97 to 25.20 when the concentrations were increased from 5ppm to 500ppm.

Table 5. Effect of Chromium on Seed Vigour Index (SVI)

Ppm	<i>Pennisetum glaucum L.</i>
Control	1362.50
1	657.47
3	974.35
5	1111.97
10	780.90
50	321
100	244.80
200	72
300	54.25
500	25.20

values are average of 30 samples.

Figure 5. Trend graph showing the Effect of Chromium on Seed Vigour Index (SVI)

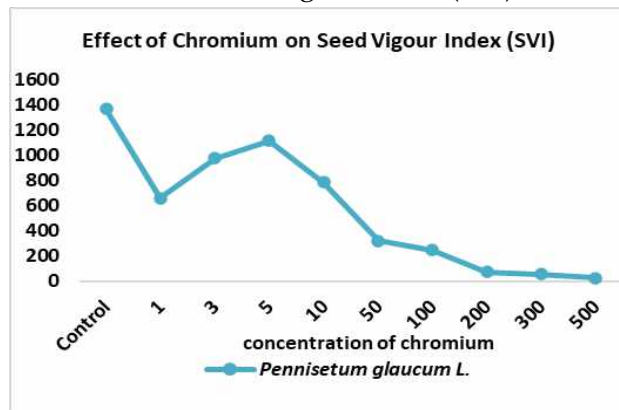


Figure 6. Effect of Chromium on *Pennisetum glaucum* L.



The transplants of the selected plants were harvested after 45 days, and the following parameters were studied. Length of root, length of shoot, fresh weight, chlorophyll a, chlorophyll b, total chlorophyll, total protein content and chromium uptake.

Effect of Chromium on root length

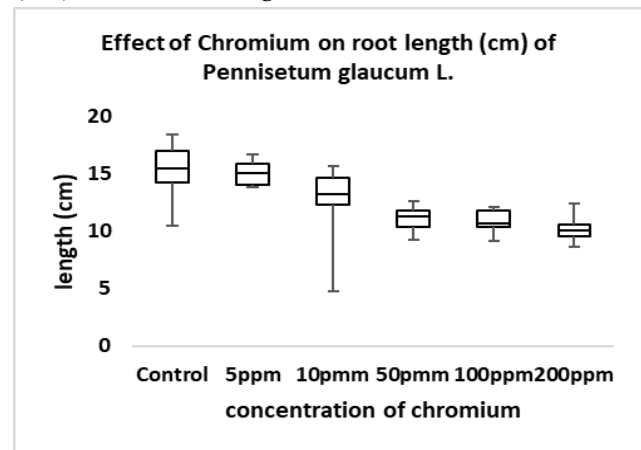
Table 6. Effect of Chromium on root length (cm) of selected plants

Concentration	Root length	Shoot length	Fresh weight
Control	15.18±2.30	73.82±0.97	8.02±1.79
5 ppm	15.03±1.03**	65.56±1.90*	7.81±1.11**
10 ppm	12.93±2.87*	63.37±1.55*	6.12±1.05*
50 ppm	11.09±0.95*	65.11±1.33*	7.31±1.50**
100 ppm	10.87±0.93*	43.9±1.95*	3.74±0.78*
200 ppm	10.15±1.02*	29.00±1.53*	3.20±0.71*

*significant at p < .01 ** not significant at p < .05 #significant at p < .05 values are average of 20 samples

Pennisetum glaucum L.: The control value of the length of the radicle was 15.18 cm, the highest value for plants treated with chromium was 15.03 cm was recorded in *P. glaucum* L. at 5ppm, followed by a gradual decrease with the lowest noted length of 10.15 cm at 200 ppm. (Table 6, Fig 7)

Figure 7. Effect of Chromium on root length (cm) of *Pennisetum glaucum* L.



Effect of Chromium on shoot length

Table 7. Effect of Chromium on shoot length (cm) of selected plants

Concentration	<i>Pennisetum glaucum</i> L.
Control	73.82±0.97
5 ppm	65.56±1.90*
10 ppm	63.37±1.55*
50 ppm	65.11±1.33*
100 ppm	43.9±1.95*
200 ppm	29.00±1.53*

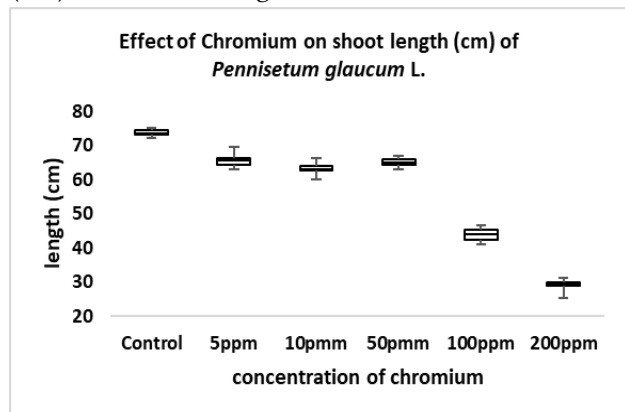
*significant at p < .01 ** not significant at p < .05 #significant at p < .05 values are average of 20 samples

Pennisetum glaucum L.: The control value of length of shoot was 73.82 cm, highest value for plants treated with fly ash was 65.56 cm was recorded at 5ppm, followed by a gradual decrease with the lowest noted length of 29 cm at 100ppm. (Table 7, Fig 8)

Pennisetum glaucum L.: The lowest values of fresh weight were recorded in *Pennisetum glaucum* L. plants. A maximum fresh weight of 8.02g for control followed by 7.81g was noted at

5ppm, and 3.20g was the lowest average fresh weight at 200ppm. (Table 9, Fig. 10)

Figure 8. Effect of Chromium on shoot length (cm) of *Pennisetum glaucum* L.



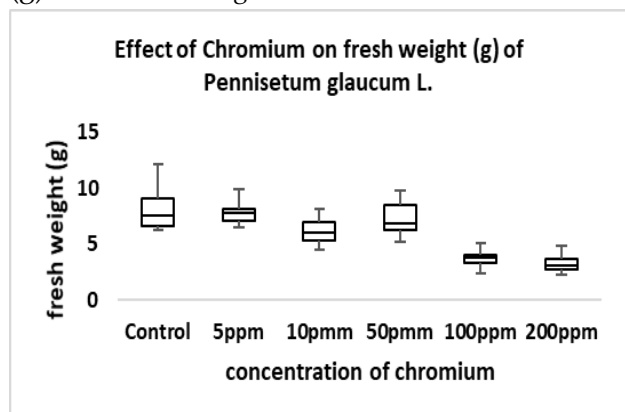
Effect of Chromium on Fresh weight

Table 9. Effect of Chromium on fresh weight (g) of selected plants

Concentration	<i>Pennisetum glaucum</i> L.
Control	8.02±1.79
5 ppm	7.81±1.11**
10 ppm	6.12±1.05*
50 ppm	7.31±1.50**
100 ppm	3.74±0.78*
200 ppm	3.20±0.71*

*significant at $p < .01$ ** not significant at $p < .05$
 #significant at $p < .05$ values are average of 20 samples

Figure 10. Effect of Chromium on fresh weight (g) of *Pennisetum glaucum* L.



Effect of Chromium on Chlorophyll content

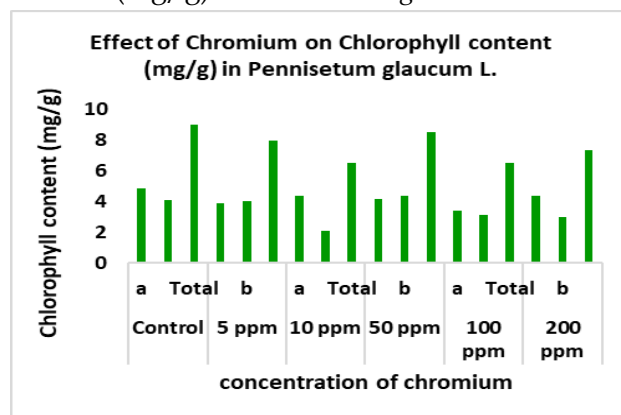
Pennisetum glaucum L.: The plants irrigated with varying chromium solution concentrations showed a lower total chlorophyll content than

the control. The control value was 8.98mg/g. The highest total chlorophyll content upon treatment with chromium was 8.55mg/g at 50ppm. The lowest calculated value of total chlorophyll was 6.51 mg/g at 100ppm. (Table 10, Fig. 11)

Table 10. Effect of Chromium on Chlorophyll content (mg/g)

Concentration	<i>Pennisetum glaucum</i> L.		
	Chl. a	Chl. b	Total Chl.
Control	4.86	4.12	8.98
5 ppm	3.89	4.04	7.93
10 ppm	4.40	2.12	6.52
50 ppm	4.19	4.35	8.55
100 ppm	3.39	3.11	6.51
200 ppm	4.38	2.98	7.37

Figure 11. Effect of Chromium on Chlorophyll content (mg/g) of *Pennisetum glaucum* L.



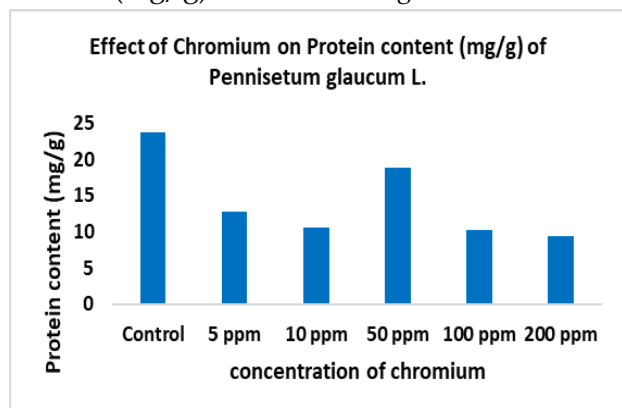
Effect of Chromium on Protein content

Table 11. Effect of Chromium on Total Protein content (mg/g)

Concentration	<i>Pennisetum glaucum</i> L.
Control	23.7
5 ppm	12.7
10 ppm	10.6
50 ppm	18.9
100 ppm	10.3
200 ppm	9.4

Pennisetum glaucum L.: The protein content for the control plants was 23.7mg/g. An increase in the protein content was measured at 50ppm of 18.9mg/g and a minimum of 9.4mg/g at 200ppm. (Table 11, Fig. 12)

Figure 12. Effect of Chromium on Protein content (mg/g) of *Pennisetum glaucum* L.



Uptake of Chromium by selected plants

Compared to other toxic metals like cadmium, lead, mercury, Chromium does not have a elucidated pathway of uptake in plants. There is a specific mechanism for its uptake and is dependent on metal speciation. The chromium ions have an oxidation state of VI in potassium dichromate. Hexavalent chromium is more soluble than trivalent chromium, forming stable complexes in the soil, thus increasing its bioavailability. (Lopez-Luna J. *et al.*, 2009). The pathway of Cr⁶⁺ transport is an active mechanism; it depends on metabolic energy and is performed by carriers of essential ions. (Cervantes, *et al.* 2001). The readings for chromium uptake by selected plants have been expressed in ppm in the following table 12.

Table 12. Uptake of Chromium by selected plants in ppm

Concentration	<i>Pennisetum glaucum</i> L.	
	Root	Shoot
Control	ND	ND
5 ppm	870.3	994.5
10 ppm	241.4	484.0
50 ppm	1076.2	2487.9
100 ppm	918.3	1333.0
200 ppm	1054.8	1347.7

***Pennisetum glaucum* L.:** In the root samples, chromium uptake was highest at 50ppm (1076 ppm). The lowest amount was recorded at 10ppm (241 ppm), and chromium was not

detected in the control samples. Whereas in the shoot samples of *Pennisetum glaucum* the lowest amount was recorded at 5ppm (994 ppm) and the maximum accumulation was measured at 50ppm (2487 ppm) (Table 12, Fig. 13, Fig. 14)

Figure 13. Uptake of Chromium (ppm) by the root of selected plants

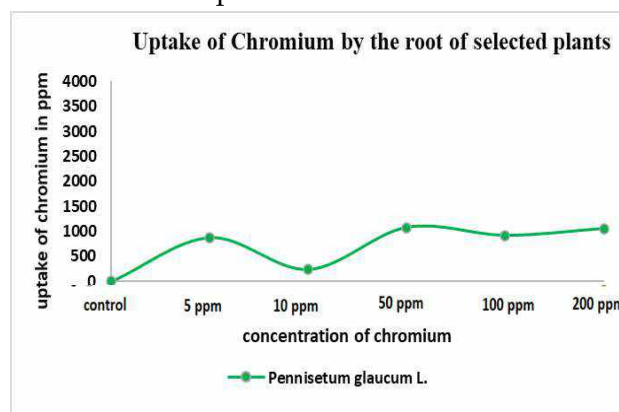
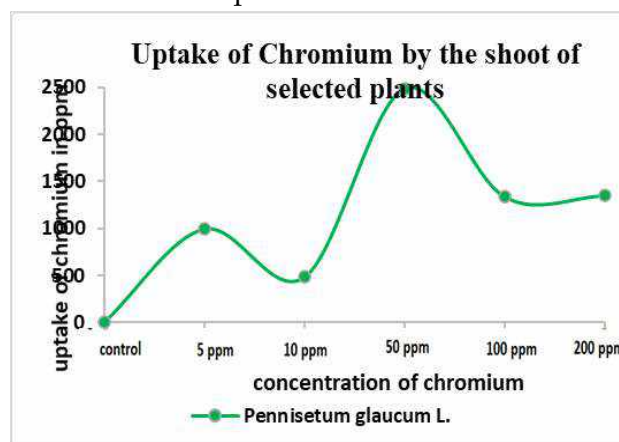


Figure 14. Uptake of Chromium (ppm) by the shoot of selected plants



Conclusion

Based on the values recorded, 5 ppm and 10 ppm of chromium indicate a favorable increase in root growth than the control, whereas at higher concentrations, an inhibitory effect was seen. Maximum inhibition of root was observed at 200 ppm chromium for all the selected plants. According to a study, 200ppm concentrations of chromium decreased paddy growth, i.e. *Oryza sativa* L. (Sundaramoorthy *et al.* 2010). The detrimental effect of chromium on roots can be explained by inhibition of the cell

division correlating with the mitotic index noted by Zou J. H. *et al.* 2006. Breakdown of root tissue and reduction in root surface caused by chromium stress may contribute to plants' decreased growth. (Oliveira H., 2012). These results have been following other researchers showing stimulation of root growth at low chromium concentrations. (Zou J.H., *et al.* 2006). Peralta J.R. *et al.* 2001 demonstrated that 5ppm showed that Cr(VI) increased root growth compared to the control, and at higher doses, there was an inhibitory effect.

Saplings of *Pennisetum glaucum* L. showed a sudden decrease in height on exposure to 100 ppm of chromium. Shoot length gradually decreased with the increase in chromium concentrations with a pronounced effect seen at 200 ppm. Overall, shoot growth was affected due to chromium's presence with a reduction in the number and size of leaves due to wilting and necrosis. This decrease in plant length and shoot growth could be correlated to reduced root growth, resulting in lesser nutrient transport and water transport to the plant's aerial parts. These results are consistent with the results reported in *Zea mays* L. (Mallick S., 2010)

Plant weight is dependent on the length and number of roots, shoots, and leaves, as chromium has negatively affected most aspects of growth, fresh weight of the transplants has decreased. The fresh weight of the plants reduced by 54.85% at 200 ppm. Poor development of lateral roots and root number was affected by exposure to chromium resulting in shorter and fewer roots hairs. (Samantary S., 2002)

A general decrease in chlorophyll content at higher chromium concentrations suggests that chlorophyll synthesis is being affected. Our results revealed a significant decrease in chlorophyll b compared to chlorophyll a as it greatly sensitive to salt stress. This decrease in

chlorophyll levels in salt-stressed plants has been considered a typical symptom of oxidative stress (Smirnoff N., 1996), resulting in chlorophyll's suppressed biosynthesis with its degradation by the enzyme chlorophyllase (Santos C.V., 2004). Vazques M.D. *et al.* 1987 reported that chromium-induced inhibition of photosynthesis is due to disorganization of chloroplasts ultrastructure.

Similarly, the protein content also decreased with the increase in chromium concentrations. A concentration-dependent decrease in soluble protein content over the control was observed in the shoot of *Albizia lebbek* (Tripathi A.K. and Tripathi S., 1999). Since plants' nitrogen content was reduced by metal stress relatively, plants' amino acids and protein content also got reduced (Crooke W.M. and Inkson R.H.E., 1955; Mayz D.M.J. and Cartwright P.M. 1984). The decrease in protein level is caused either by a reduced biosynthesis or an increased disintegration of proteins to amino acids (Todd G.W. and Arnold W.M., 1961). The decrease in protein content can also be attributed to oxidative damage caused by ROS generated under abiotic stress conditions. Proteins play an imminent role in plant stress response since they are involved in mobilizing their energy reserves, energy reserves consumption, and an enhanced protein degradation under stress.

Uptake and accumulation of chromium was mainly in the roots, with little translocation to the shoots. A maximum concentration of chromium was seen at 50 ppm in the root as well as shoot. Chromium is immobilized in the root cells' vacuoles could be a reason for higher accumulation in roots. (Shanker A.K. *et al.* 2004). Another study with temperate trees confirmed that chromium was poorly taken up into the aerial tissues but predominantly in the root. (Pulford I.D. *et al.* 2001). Bishnoi N.R. *et al.* 1993 reported that chromium toxicity had a

detrimental effect on seed germination, seedling growth, chlorophyll, and crop plants' nutrient content.

Plant yield is dependent on the plant's all-around development, including a number of roots, length of the shoot, and leaf growth as chromium affects physiological processes and the morphology in plants, productivity decreases. The present study indicated that accumulation is high in the roots compared with the shoot, thereby holding the metal firmly in the ground away from the reach of other interactions of the shoot. In this plant, chromium at low concentrations (5ppm) was found to promote growth and increase yield. However, it is not an essential element for plants, whereas increasing metals' concentration severely inhibited the growth in terms of various morphological and physiological parameters. Since it is an edible crop, despite showing a good potential for phytoremediation techniques, it can't be used to hyper accumulate this metal to remove it from the soil as *Pennisetum glaucum* L. showed more accumulation of the heavy metal in the shoot than the root.

References

- Hawkes JS (1997). Heavy Metals, J. Chem. Educ. 74(11): 1374Mildvan A.S. (1970). Metals in enzyme catalysis. In: The enzymes, Vol. " (Ed: D.D. Boyer). Academic Press, London. pp. 445-536.
- Blaylock M.J., and Huang J.W. (1999). Phytoextraction of metals. In Phytoremediation of Toxic Metals: Using Plants to Clean Up the Environment, eds. Wintz H. *et al.* 2002
- Fryzova R., Pohanka M., Martinkova P., Cihlarova H., Brtnicky M., Hladky J. and Kynicky J. (2017). Oxidative Stress and Heavy Metals in Plants. 10.1007/398_2017_7.
- Baker A.J.M. and Brooks R.R. (1989). "Terrestrial higher plants which hyper accumulate metallic elements: a review of their distribution, ecology, and phytochemistry," Bio recovery, vol. 1, pp. 81-126.
- Tiller K.G. (1986). Essential and toxic heavy metals in waters and their ecological relevance. Trans. XIII Congr. Intern. Soc. Water Sci. 1, 29-44.
- Imam Khasim D., Nandakumar N.V., Hussain R.C., Bhagyalakshmi K., and Naidu D.M. (1994). Chromium translocation from farm water contaminated with chromate industrial effluents into plants. Po/In. Res. 13:303-316.
- Jasuja K., Parwana H.K., and Rao A.L.J. (1997). Removal of Cr (VI) from wastewater by *Ablemoschus esculentus*. Indian J. Environ. Hlth. 39:103-108.
- Purohit S., Varghese T.M., and Kumari M. (2003). Effect of Cr on morphological features of tomato and bringal. Indian J. Environ. Bioi. 8, 17-22.
- Mertz W. (1993). Chromium in human nutrition: a review. The Journal of Nutrition, 123: 626 633.
- Sundaramoorthy P., Chidambaram A., Sankar G., Kaliyaperumal, Unnikannan P., and Baskaran L. (2010). Chromium stress in paddy: (i) Nutrient status of paddy under chromium stress; (ii) Phytoremediation of chromium by aquatic and terrestrial weeds. Comptes rendus biologiques. 333. 597-607.
- Shanker A.K., Cervantes C., Loza-Tavera H. and Avudainayagam S. (2005). Chromium toxicity in plants. Environ. Int., 31, 739.

12. Sharma D. C., Chatterjee C., and Sharma C. P. (1995). Chromium accumulation by barley seedlings (*Hordeum vulgare* L.). *Journal of experimental botany* 25: 241-251.
13. Toxicological Profile for Chromium. (2000). Agency for Toxic Substances and Disease Registry, Health Administration Press, Atlanta, Ga, USA.
14. World Health Organization, Quality Control Methods for Medicinal Plant Materials, WHO, Geneva, Switzerland, 2005.
15. Arnon D. (1949) Copper Enzymes in Isolated Chloroplasts. Polyphenol oxidase in *Beta vulgaris*. *Plant Physiology*, 24, 1-15.
16. Lowry O.H., Rosebrough N.J., Fair A.L., and Randall R.J. (1951). Protein measurement with the Folin phenol reagent. *J. Biol. Chem.*, 193: 265-275.
17. Sundaramoorthy P., Chidambaram A., Sankar G., Kaliyaperumal, Unnikannan P., and Baskaran L. (2010). Chromium stress in paddy: (i) Nutrient status of paddy under chromium stress; (ii) Phytoremediation of chromium by aquatic and terrestrial weeds. *Comptes rendus biologiques*. 333. 597-607.
18. Zou J. H., Wang M., Jiang W. S. and Liu D. H. (2006). "Effects of hexavalent chromium (VI) on root growth and cell division in root tip cells of *Amaranthus viridis* L.," *Pakistan Journal of Botany*, vol. 38, no. 3, pp. 673-681.
19. Oliveira H. (2012). "Chromium as an environmental pollutant: insights on induced plant toxicity," *Journal of Botany*, vol. 2012, Article ID 375843.
20. Peralta J.R., Gardea Torresdey J.L., Tiemann K.J., Gomez E., Arteaga S., Rascon E., et al. (2001). Uptake and effects of five heavy metals on seed germination and plant growth in alfalfa (*Medicago sativa*) L. *B Environ Contam Toxicol*. 66(6):727-34.
21. Mallick S., Sinam G., Mishra R.K. and Sinha S. (2010). "Interactive effects of Cr and Fe treatments on plants growth, nutrition and oxidative status in *Zea mays* L.," *Ecotoxicology and Environmental Safety*, vol. 73, no. 5, pp. 987-995.
22. Samantary S. (2002). Biochemical responses of Cr-tolerant and Cr sensitive mung bean cultivars grown on varying levels of chromium, *Chemosphere*, 47 (10): 1065-1072.
23. Smirnoff N. (1996). The function and metabolism of ascorbic acid in plants. *Annals of Botany* 78: 661-669.
24. Santos C.V. (2004). Regulation of chlorophyll biosynthesis and degradation by salt stress in sunflower leaves *Scientia Horticulturae*, 103, pp. 93-99
25. Vazques M.D., Poschenrieder C. and Barcelo J. (1987). Chromium (VI) induced structural changes in bush bean plants. *Ann Bot*. 59: 427-38.
26. Tripathi A.K. and Tripathi S. (1998). Changes in some physiological and biochemical characters in *Albizia lebbek* as bio- indicators of heavy metal toxicity. *J. Environ. Biol.*, 20(2), 93-98.
27. Crooke W.M. and Inkson R.H.E. (1955). Relation between nickel toxicity and major nutrient supply. *Plant Water* 6:1-15.
28. Mayz D.M.J. and Cartwright P.M. (1984). The effect of pH and aluminium toxicity on the growth and symbiotic development of cowpea (*Vigna unguiculata*). *Plant Water* 80; 423-430.
29. Todd G.W, and Arnold W.M. (1961). Evaluation of methods used to determine

injury to plant leaves to air pollution. Bot Gaz 1961; 123: 151-154


30. Shanker A.K., Djanaguiraman M., Sudhagar R., Chandrashekar C.N. and Pathmanabhan G. (2004). Differential antioxidative response of ascorbate glutathione pathway enzymes and metabolites to chromium speciation stress in green gram (*Vigna radiata* (L.) R. Wilczek, cv. CO 4) roots. Plant Sci., 2004a; 166: 1035 - 1043.

31. Pulford I.D., Watson C. and McGregor S.D. (2001). Uptake of chromium by trees: prospects for phytoremediation. Environ Geochem Health; 23: 307 - 11.

32. Bishnoi N. R., Dua A., Gupta V. K. and Sawhney S.K. (1993). Effects of chromium on seed germination, seedling growth and yield of, peas. Agri. Eco. Environ. 47,47-57.

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ANALYSIS OF ELEMENTAL COMPOSITION OF FOLIAR DUST IN MUMBAI

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Abstract

Dust pollution is one of the very dangerous types of air pollution. In Mumbai, excess of vehicles and continuous construction create a lot of dust pollution adding to major quantity of dust pollutants such as Suspended Particulate Matter (SPM), Heavy Metals, etc. in the city atmosphere. The excess of atmospheric heavy metals can lead to various health issues. The plants have been found to be very effective in monitoring and controlling dust pollution. The leaves too can capture good amounts of dust. In this research work, the foliar dust from *Ficus benjamina* L. var. *nuda* (Miq.) M. F. Barrett. was collected from various locations in the city. The elemental compositions of foliar dust samples were analyzed for their composition. Field Emission Gun-Scanning Electron Microscopes (FEG-SEM) was used to analyze Energy Dispersive Spectroscopy (EDS) at SAIF department in IIT, Powai. Carbon (C), Oxygen (O), Magnesium (Mg), Aluminium (Al), Silicon (Si), Potassium (K), Calcium (Ca), Manganese (Mn), Ferrous (Fe) and Copper (Cu) were discovered in the dust samples obtained from all the sites. Carbon (C) and Oxygen (O) were majorly seen in the dust samples. Similarly, Sodium (Na), Phosphorus (P), Sulphur (S), Titanium (Ti), Zinc (Zn) and Molybdenum (Mo) were found to be less common and if present, were available in traces.

Key words: *Dust pollution, Mumbai, SPM, Heavy Metals, FEG-SEM and EDS.*

INTRODUCTION

One of the major problems in Mumbai is Dust Pollution. SPM, RSPM, SO₂, NO_x, many inorganic and organic pollutants, trace metals are hazardous pollutants in air [Caselles et al., 2002; Maitre et al., 2006; Curtis et al., 2006; Sharma et al., 2006; Jayaraman, 2007]. SPM system ranges from <0.01cm to >100cm [Wan- Kuen et al., 2005, 2006]. As, Cd, Co, Cr, Ni, Pb and Se are dangerous respirable particulate matter i.e. <10 µm [ATSDR, 2003; Wang et al., 2006]. 40-80% of total air pollution in the city comes from vehicular

emission [Ghose et al., 2005]. The dust and urban soil show presence of heavy metals due to traffic [Mert Guney et. al., 2010]. More vehicles create more emission leading to more Particulate Matter causing air pollution [Zanini et al., 2006]. Plants can monitor and control dust pollution and leaf surfaces play vital role in catching dust [Chaphekar et al, 1980]. The plants growing closer to the highway showed higher concentrations of heavy metals in the leaf, stem and root tissues [Falusi B. A., 2010]. The vehicles emit traces of metals which are found in Petrol, Diesel, Oil, etc. [Monacci and Bargagli, 1997]. Plant species growing on the roads involving higher number of petrol-fueled vehicles showed higher concentration of heavy metals like Lead (Pb) in foliar deposits [C. Aydinalp *et al*, 2004].

MATERIALS AND METHODS

The dust samples were collected from ten sites (Table 1) in Mumbai city from the leaf surfaces of *Ficus benjamina* L. var. *nuda* (Miq.) M. F. Barrett. The elemental composition of these dust samples were determined at SAIF department in IIT, Powai. Field Emission Gun- Scanning Electron Microscopes (FEG-SEM) Model: JSM-7600F, Resolution: 15 kv, 1 kv, Accelerating voltage: 0.1 to 30 kv, Magnification: x25 to 1,000,000 was used to analyse the dust samples. The dust samples were carried using small metal stubs coated with carbon paper on one end. Dust, being a non-conducting material, required a suitable metallic coating for better image quality. Platinum coating was done in an instrument (Model: JFC 1600) for 250 seconds. The Platinum coated metal stubs were then inserted in FEG-SEM instrument and to analyze elemental composition of the dust samples through EDS - Energy Dispersive Spectroscopy (Figure 1 and Figure 2).

RESULTS AND DISCUSSIONS

The sites selected for collecting dust samples were Marine Drive, Sion Circle, Ghatkopar, Mulund, Borivali, Goregaon, Malad, Bandra, Bandra Kurla Complex and K. C. Marg which included highways, traffic islands, link roads, primary roads and secondary roads (Table 1). The dust samples collected from selected 10 sites were analyzed for their elemental compositions in Atomic% and Weight% (Figure 1 and Table 2).

Table 1: Description of selected sites in Mumbai City

Site No.	Name of the Sites and their Description
1	South Mumbai - Marine Drive: Main road, facing the sea-moderate to heavy traffic, all types except three wheelers.
2	Eastern Express Highway - Sion Circle, Dr. Babasaheb Ambedkar Road: Main road, heavy traffic, all types of vehicles but more of heavy vehicles. This site also shows signals leading to traffic jams.
3	Eastern Express Highway - Ghatkopar: Main road, heavy traffic, all types of vehicles but more of heavy vehicles. No signals for longer distance, leading to faster moving traffic.
4	Lal Bahadur Shastri Marg - Mulund: Major arterial road passing through an industrial area showing heavy vehicular traffic.
5	Western Express Highway - Borivali: Main road, Heavy traffic, construction activity, all types of vehicles. Broad road with lots of vehicles moving at high speed.
6	Swami Vivekanand Road - Goregaon: Main road, Moderate to heavy traffic, all types of vehicles, construction activity, including three wheelers.
7	Linking Road - Malad West: Frequency of vehicles is very less compared to express highways. It's a broader road and this location is the common connection for various roads.
8	Linking Road - Bandra West: Frequency of vehicles is very less compared to express highways. It's a broader road compared to SV road.
9	Secondary Roads - Bandra Kurla Complex: Derived from primary roads and shows a lesser number of vehicles. It is the link between Western Express highway and Lal Bahadur Shastri marg.
10	Secondary Roads - K. C. Marg, Bandra: Derived from primary roads and shows a lesser number of vehicles. One end of this site opens at Worli Sea Link and the other one connects at the junction of SV road, Mahim and Western Express highway.

Table 2: Elemental composition (in Atomic%) of dust samples at selected sites

Element	Site 1	Site 2	Site 3	Site 4	Site5	Site 6	Site 7	Site 8	Site 9	Site 10										
	Weight%	Atomic%	Weight%	Atomic%	Weight%	Atomic%	Weight%	Atomic%	Weight%	Atomic%										
C	18.14	26.92	15.99	25.5	16.76	26.11	13.48	21.38	12.71	19.77	22.32	32.55	16.79	25.12	29.95	40.02	30.42	41.29	33.55	44
	47.82	53.26	45.43	54.39	47.78	55.89	48.14	57.3	51.22	59.82	45.63	49.96	50.71	56.98	50.3	50.46	46.36	47.24	46.85	46.12

	Na	Mg	Al	Si	P	S	K	Ca	Ti	Mn	Fe	Cu	Zn	Mo	Total
100	-	7.45	4.08	13.19	-	0.7	0.1	1.25	-	0.14	6.8	0.33	-	-	100
100	-	5.46	2.69	8.37	-	0.39	0.05	0.56	-	0.05	2.17	0.09	-	-	100
100	0.6	1.4	3.35	8.88	1.24	0.1	0.37	8.16	4.81	-	8.26	0.7	0.73	-	100
100	0.5	1.1	2.38	6.05	0.77	0.06	0.18	3.9	1.92	-	2.83	0.21	0.21	-	100
100	-	0.61	1.8	6.34	-	0.44	-	23.18	0.18	-	1.66	0.7	0.56	-	100
100	-	0.47	1.25	4.22	-	0.25	-	10.82	0.07	-	0.55	0.21	0.16	-	100
100	0.74	1.92	3.68	12.26	-	0.35	0.59	10.4	0.52	0.17	6.56	0.69	0.5	-	100
100	0.61	1.5	2.6	8.31	-	0.21	0.29	4.94	0.21	0.06	2.24	0.21	0.15	-	100
100	0.67	1.45	4.15	16.24	-	-	0.47	4.23	0.56	0.15	6.73	0.39	0.46	0.58	100
99.99	0.55	1.11	2.87	10.8	-	-	0.23	1.97	0.22	0.05	2.25	0.11	0.13	0.11	99.99
100	-	7.34	0.77	13.28	-	-	-	1	-	0.17	8.43	0.47	0.48	0.11	100
100	-	5.29	0.5	8.28	-	-	-	0.44	-	0.06	2.64	0.13	0.13	0.02	100
99.99	1.21	1.64	5.21	11.7	0.34	-	0.39	5.65	0.33	0.11	4.04	0.25	0.4	1.22	99.99
99.98	0.94	1.21	3.47	7.48	0.2	-	0.18	2.54	0.12	0.03	1.3	0.07	0.11	0.23	99.98
100	-	0.69	2.48	6.55	-	0.23	0.2	7.84	0.17	-	1.37	0.22	-	-	100
99.99	-	0.45	1.47	3.74	-	0.12	0.08	3.14	0.06	-	0.39	0.06	-	-	99.99
100	0.18	0.88	3.35	9.89	-	-	0.39	3.37	0.23	-	3.77	0.48	0.39	0.3	100
99.99	0.13	0.59	2.02	5.74	-	-	0.16	1.37	0.08	-	1.1	0.12	0.1	0.05	99.99
100	0.69	0.81	3.66	8.32	0.19	0.21	0.43	2.08	0.33	0.04	2.14	0.38	0.32	-	100
99.99	0.47	0.53	2.13	4.66	0.1	0.1	0.17	0.82	0.11	0.01	0.6	0.09	0.08	-	99.99

Ma x	47.82	53.26	45.43	54.39	47.78	55.89	48.14	57.3	51.22	59.82	45.63	49.96	50.71	56.98	50.3	50.46	46.36	47.24	46.85	46.12
Min	0.1	0.05	0.1	0.06	0.18	0.07	0.17	0.06	0.15	0.05	0.11	0.02	0.11	0.03	0.17	0.06	0.18	0.05	0.04	0.01

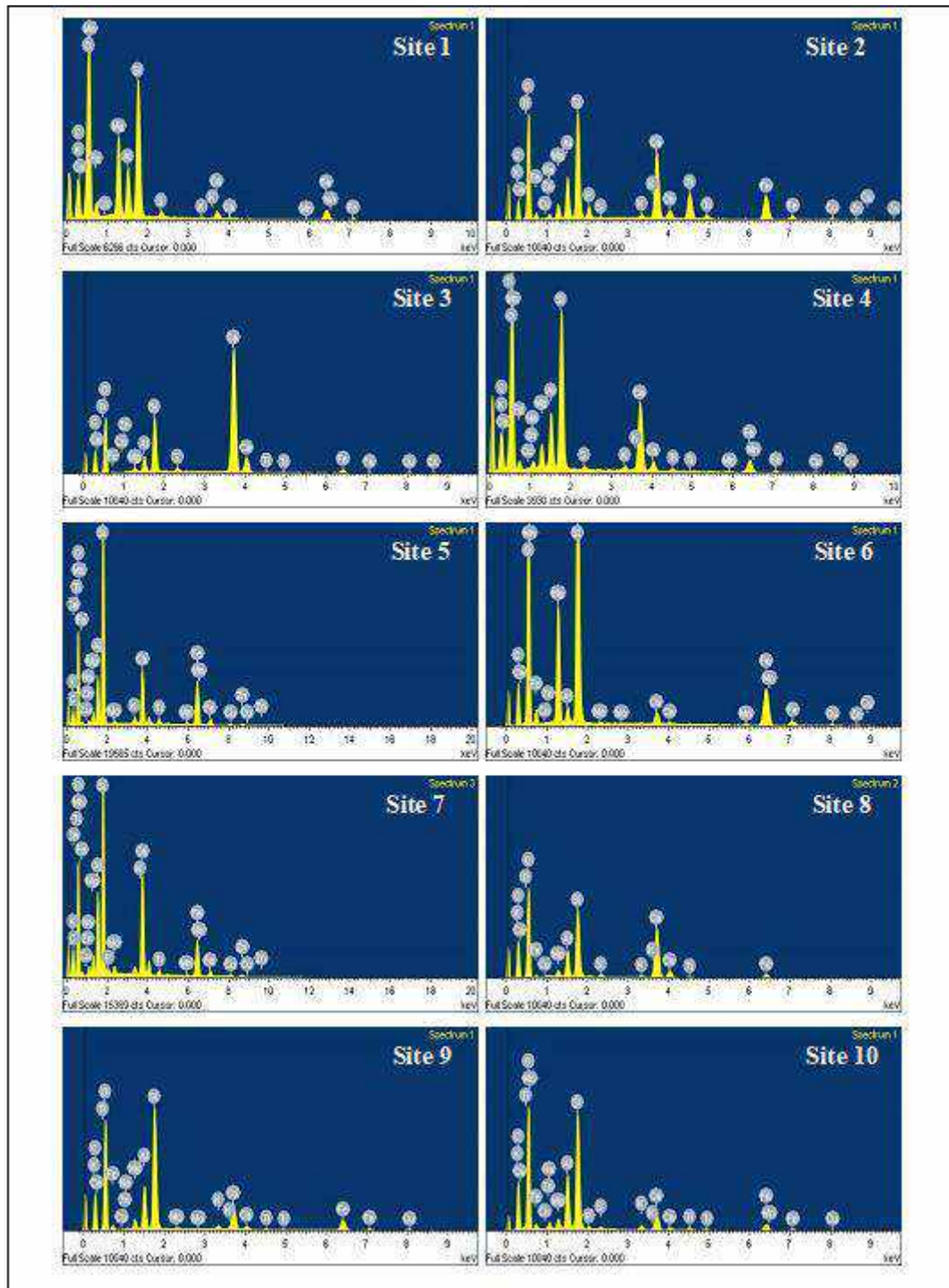


Figure 1: Elemental Composition of Dust samples from selected sites

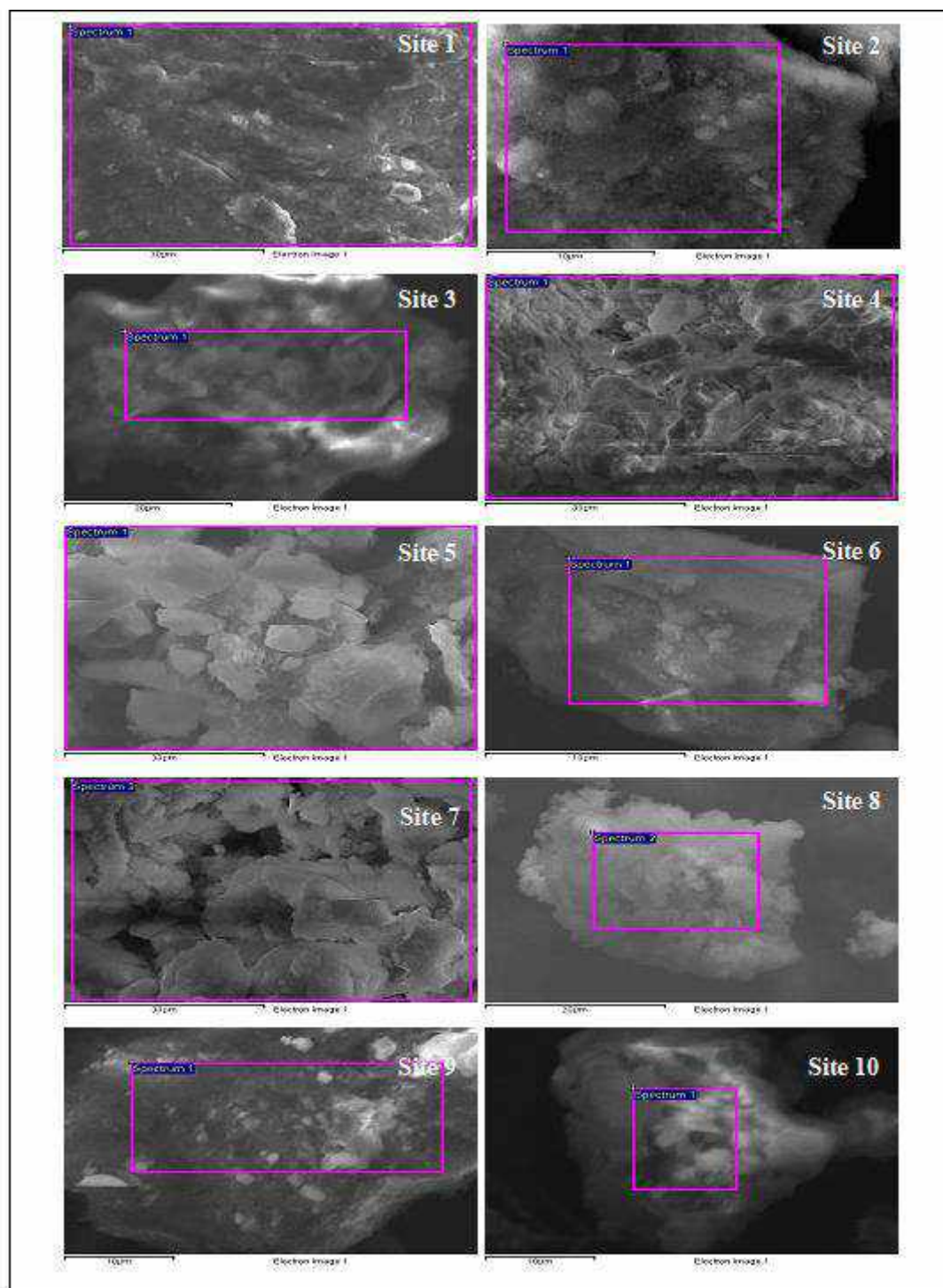


Figure 2: Scanned Electron Micrograph (SEM) of dust samples from selected sites

Site 1 : South Mumbai - Marine Drive

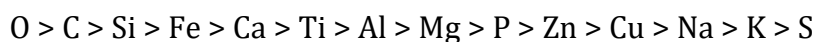
One of the most active sites of Mumbai was Marine Drive, a sea facing site with continuously moving private vehicles. Eleven elements; Carbon, Oxygen, Magnesium, Aluminium, Silicon, Sulphur, Potassium, Calcium, Manganese, Ferrous and Copper were discovered in the dust sample collected from this site. Oxygen and Carbon were found to

be maximum in proportion. Whereas Potassium was contributing the least, i.e. by weight % it was 0.1% and by atomic % it was only 0.05%. The heavy metal, Cu, was 0.33% by weight % and 0.09% by atomic % (Figure 1 and Table 2). Proportionally, the decreasing order of elemental composition was



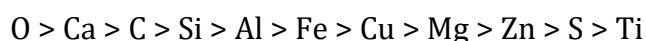
Site 2 : Eastern Express Highway - Sion Circle, Dr. Babasaheb Ambedkar Road

Sion Circle was a very active road showing continuous slow moving traffic showing all types of vehicles. Dust collected from this site showed presence of 14 elements Carbon, Oxygen, Sodium, Magnesium, Aluminium, Silicon, Phosphorus, Sulphur, Potassium, Calcium, Titanium, Ferrous, Copper and Zinc. Oxygen and Carbon were mainly present. Whereas lowest contributor was Sulphur having 0.1% by weight % and 0.06 % by atomic %. Copper and Zinc were the two heavy metals discovered in the sample. The proportion of Cu by weight % was 0.7% and that of Zn was 0.73%. Similarly the proportion of both Cu and Zn by atomic % was 0.21% (Figure 1 and Table 2). The quantitative decreasing order of these elements was



Site 3 : Eastern Express Highway - Ghatkopar

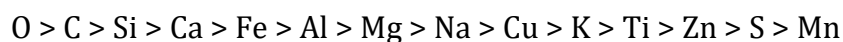
Ghatkopar being at Eastern Express highway, was a broad road including fast moving heavy vehicles. Eleven elements that include Carbon, Oxygen, Magnesium, Aluminium, Silicon, Sulphur, Calcium, Titanium, Ferrous, Copper and Zinc were found in the dust sample collected from here. The dust was mainly Oxygen and Carbon. The least content of the dust was by Ti i.e. 0.18% by weight % and 0.07% by atomic %. The traces of heavy metals viz; Cu and Zn were discovered in the sample. Copper was 0.7% by weight % and 0.21% by atomic %. Whereas Zinc was 0.56% by weight % and 0.16% by atomic % (Figure 1 and Table 2). The arrangement of elements in their decreasing proportion was



Site 4 : Lal Bahadur Shastri Marg - Mulund

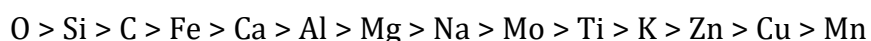
Lal Bahadur Shastri Marg in Mulund was site 4 witnessing continuous movement of all types of vehicles mainly Heavy vehicles. The dust sample contained 14 elements;

Carbon, Oxygen, Sodium, Magnesium, Aluminium, Silicon, Sulphur, Potassium, Calcium, Titanium, Manganese, Ferrous, Copper and Zinc. The dust was mainly comprised of Oxygen and Carbon. Mn was contributing the minimum i.e. 0.17% by weight % and 0.06% by atomic %. The heavy metals like Cu and Zn in the dust were 0.69% and 0.5% by weight % respectively. Similarly, by atomic % Cu was 0.21% and Zn was 0.15% (Figure 1 and Table 2). Proportionally, the decreasing arrangement of elements was



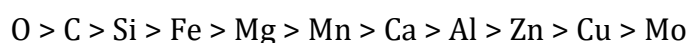
Site 5 : Western Express Highway - Borivali

Borivali was the site 5, located on Western Express highway, showing 2-wheelers, 4-wheelers, trucks, busses, etc. moving at high speed. The 14 elements detected in the dust sample of this site included Carbon, Oxygen, Sodium, Magnesium, Aluminium, Silicon, Potassium, Calcium, Titanium, Manganese, Ferrous, Copper, Zinc and Molybdenum. The major proportion of the dust was composed of Oxygen and Carbon whereas the least contribution was by Manganese. The weight % and atomic % of Mn were 0.15% and 0.05% respectively. The heavy metals found in this sample were Copper, Zinc and Molybdenum. The contribution of Cu, Zn and Mo was 0.39%, 0.46% and 0.58% by weight % and 0.11%, 0.13% and 0.11% by atomic % respectively (Figure 1 and Table 2). These 14 elements were showing the proportional sequence as



Site 6 : Swami Vivekanand Road - Goregaon

The site 6 was located in Goregaon at Swami Vivekanand road which had good frequency of public and private vehicles. The 11 elements viz; Carbon, Oxygen, Magnesium, Aluminium, Silicon, Calcium, Manganese, Ferrous, Copper, Zinc and Molybdenum were detected in the dust sample collected from this site. Oxygen and Carbon were contributing the maximum of the total dust. Similarly, Molybdenum contributed the least and the values were 0.11% as weight % and 0.02% as atomic %. The dust also showed the minimal presence of heavy metals Zinc and Copper. Both of these constituted 0.13% by atomic %. But by weight % Cu and Zn were sharing 0.47% and 0.48% respectively (Figure 1 and Table 2). Quantitatively all the elements were showing the sequence



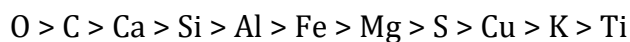
Site 7 : Linking Road - Malad West

On Link road, in Malad, all types of vehicles were observed with a moderate traffic. There were fifteen elements detected in the dust sample of this site which include Carbon, Oxygen, Sodium, Magnesium, Aluminium, Silicon, Phosphorus, Potassium, Calcium, Titanium, Manganese, Ferrous, Copper, Zinc and Molybdenum. The proportion of Oxygen and Carbon was too high but that of other elements was too low. The least participation was made by Manganese by sharing only 0.11% weight % and 0.03% by atomic %. Copper, Zinc and Molybdenum were the heavy metals found in the dust sample. The proportion of Cu, Zn and Mo was 0.25%, 0.4% and 1.22 % by weight % and 0.07%, 0.11% and 0.23% by atomic % respectively (Figure 1 and Table 2). The proportional sequence of all these 15 elements was



Site 8 : Linking Road - Bandra West

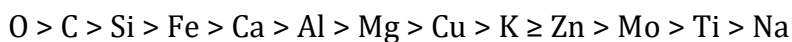
Site 8, at linking road in Bandra west, showed slow moving traffic with short distance signals. The dust sample from this site showed the presence of 11 elements; Carbon, Oxygen, Magnesium, Aluminium, Silicon, Sulphur, Potassium, Calcium, Titanium, Ferrous and Copper. The dust was mainly composed of oxygen and carbon and on the other hand remaining elements were contributing quite low. Titanium was forming 0.17% by weight % and 0.06 % by atomic % of the dust and was lowest of all elemental proportion. The sample also traced the presence of heavy metal Cu as 0.22% by weight % and 0.06% by atomic % (Figure 1 and Table 2). The decreasing order of the elements was



Site 9 : Secondary Roads – Bandra Kurla Complex

Western and Eastern Express highways and Lal Bahadur Shastri marg were connected with each other by Bandra Kurla Complex, the site 9. His site had active traffic including all types of vehicles. 13 elements found in the dust from this site were Carbon, Oxygen, Sodium, Magnesium, Aluminium, Silicon, Potassium, Calcium, Titanium, Ferrous, Copper, Zinc and Molybdenum. The dust was concentrated with Oxygen and Carbon whereas the least proportion was of Na. The traces of Na by weight % and by atomic % were 0.18% and 0.13% respectively. The dust also showed the presence of

heavy metals Cu and Zn. The proportion of Cu was 0.48% by weight % and 0.12% by atomic % whereas that of Zn was 0.39% and 0.1% respectively (Figure 1 and Table 2). These 13 elements were arranged in decreasing order as



Site 10 : Secondary Roads – K. C. Marg, Bandra

The site 10, Krishna Chandra Marg, was located in Bandra west which connected primary and secondary roads with Bandra Worli Sea Link and witnessed 2-wheelers, 3-wheelers, Trucks and Buses. There were 15 elements Carbon, Oxygen, Sodium, Magnesium, Aluminium, Silicon, Phosphorus, Sulphur, Potassium, Calcium, Titanium, Manganese, Ferrous, Copper and Zinc discovered in the dust sample collected from this site. The highest proportion of the dust was by Oxygen and Carbon. Similarly, the minimum contributor was Mn having 0.04% by weight % and 0.01% by atomic %. Traces of heavy metals like Cu and Zn were detected. The weight % of both these elements were 0.38% and 0.32% and the atomic % were 0.09% and 0.08% respectively (Figure 1 and Table 2). The decreasing order of the discovered elements was



CONCLUSIONS

Presence of heavy metals in foliar dust available at various sites is an indication towards the existence of excess metallic pollutants in ambient Air. There were a total 16 elements found in the dust samples collected from all the 10 sites. There were eleven elements detected in the dust sample from Marine Drive, fourteen elements from Mulund (LBS marg), similarly eleven were discovered in the dust sample from Goregaon (SV road), the dust sample from Bandra (Linking road) also had eleven elements within it, fifteen elements were found in the dust collected from Malad (Linking road), fourteen elements were seen in the dust from Borivali (Western Express highway), dust sample from Sion Circle (Eastern Express highway) contained fourteen elements, eleven elements were available in the dust from Ghatkopar (Eastern Express highway), there were fourteen elements in the dust sample collected from Mulund (Lal Bahadur Shastri marg), fifteen were detected in the dust obtained from K.C. Marg (Bandra-W) and the dust collected from Bandra Kurla Complex showed the presence of thirteen elements.

As per FEG-SEM data, Oxygen is most commonly available in dust at all the ten sites in highest proportion. Similarly, proportionally Carbon is the second highest element in dust. Whereas Silicon had been found frequently in the foliar dust. The elements found in the dust of all the ten selected sites were C, O, Mg, Al, Si, K, Ca, Mn, Fe and Cu. Whereas Na, P, S, Ti, Zn and Mo were less common and if present, available in traces.

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REFERENCES

1. Caselles J, Colliga C and Zornoza P, 2002, Evaluation of trace element pollution from vehicle emissions in petunia plants, *Water, Air, And Soil Pollution*, 136:1-9
2. Maitre A, Bonnetterre V, Huillard L, Sabatier P and Gaudemaris R, 2006, Impact of urban atmospheric pollution on coronary disease, *European. Heart J.*, 27, 2275-2284.
3. Curtis L, Rea W, Smith-Willis P, Fenyves E and Pan Y, 2006, Adverse health effects of outdoor air pollutants, *Environ. Intern.*, 32:815-830.
4. Sharma K, Singh R, Barman SC, Mishra D, Kumar R, Negi MPS, Mandal SK, Kisku GC, Khan AH, Kidwai MM and Bhargava SK, 2006, Comparison of trace metals concentration in PM₁₀ of different location of Lucknow city, *Bullet Environ. Contam. Toxicol.*, 77(3):419-426
5. Jayaraman GN, 2007, Air quality and respiratory health in Delhi, *Environ. Monit. Assess* DOI 10.1007/s., 10661-007-9651-0.
6. Wan-Kuen, Jo, Jin-HO and Park, 2005, Characteristics of roadside air pollution in Korean metropolitan city (Daegu) over last 5 to 6 years: Temporal variations, standard exceedances and dependences on meteorological conditions, *Chemosphere*, 59:1557-1573.
7. Wan-Kuen, Jo, Joon-Yeob and Lee, 2006, Indoor and outdoor levels of respirable particulates (PM₁₀) and Carbon monoxide in high-rise apartment building *Atmospheric Environ.*, 40:6067-6076.

8. ATSDR, 2003, Toxicological profile information sheet. <http://www.atsdr.cdc.gov/toxprofiles>
9. Wang X, Bi X, Sheng G and Fu J, 2006, Hospital indoor PM₁₀ / PM_{2.5} and associated trace elements in Huangzhou, China, Sci. Total Environ., 366:124-135.
10. Ghose Mrinal & Paul R and Banerjee SK, 2004, Assessment of the impacts of vehicular emissions on urban air quality and its management in Indian context: The case of Kolkata (Calcutta), Environmental Science & Policy, 7. 345-351. 10.1016/j.envsci.2004.05.004.
11. Mert G, Turgut TO and Nadim KC, 2010, Impact of overland traffic on heavy metal levels in highway dust and soils of Istanbul, Turkey, Environ Monit Assess. 164:101-110.
12. Zanini G, Berico M, Monforti F, Vitali L, Zambonelli S, Chiavarini S, Georgiadis T and Nardino M, 2006, Concentration measurement in a road tunnel as a method to assess “real-world” vehicles exhaust emissions, Atmos. Environ., 40:1242-1254.
13. Chaphekar SB, Boralkar DB and Shetye RP, 1980, Plants for air monitoring in industrial area, Furtado. J.I. (Ed.) Tropical Ecology and development. I.S.T.E. Kuala Lumpur, 669-675.
14. Falusi BA, 2010, Heavy metal contents of *Azadirachta indica* collected from Akungba-Akoko (Nigeria), African Journal of Health Sciences, 16:3-4.
15. Monacci F and Bargagli R, 1997, Barium and Other Metals as Indicator of Vehicle Emissions, Water, Air, and Soil Pollut. 100:89-98.
16. Aydinalp C and Marinova S, 2004, Lead in Particulate Deposits and in Leaves of Roadside Plants, Polish Journal of Environmental Studies, 13(2):233-235.

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THE IMPACT OF ONLINE LEARNING ON CHILDREN – A PARENT PERSPECTIVE, WITH REFERENCE TO COVID-19

Dr. Khan Suhana Begum Sanaulla Shabina*

ABSTRACT

Every sector has adopted technology, and so as education. Academicians, students, have good hands over experience over digital method of learning. Emphasizing on the present scenario, not only academicians and students but parents are also getting well versed with the concept of online learning. Online learning has created a learning platform not only for students but for parents as well. Parents, who were very much comfortable with traditional way of learning, are now getting engaged with the concept of online learning, may be necessity being one of the reason why modern or digital way of learning is been adopted.

Keywords: Online Learning, Digital Learning, Parent, Student

INTRODUCTION:

The existence of digital learning was visible long back, schools, college; education institutions were making use of smart boards, projectors for innovative teaching and learning methods. However optimum utilisation and the actual impact of online learning is been observed in the present scenario. A high agreement not only from students and academicians but from parents as well. The method of online learning has brought about a change not only in students and teachers life but also in reference to parents.

Earlier parents use to drop their children to schools, wherein a connection of teacher and students was seen, whereas in the present hour it's a triangular connect, a bonding of student, teacher and the parent. Along with teacher and student, parents are playing an equally important role in online learning, specifically when it comes to students who are primary and pre-primary level.

REVIEW OF RELATED LITERATURE:

(Zhao, et al., 2020) Conducted a study on homeschooling, according to the study the concept and practice of homeschooling was acceptable by students, parents and teachers during COVID 19. despite

teachers were in concern that this might diminish the interest, and students focus on academic.

(Bhamani, Makhdoom, Bharuchi, Ali, Kaleem, & Ahmed, 2020) Study emphasized on, home learning is a substitute to school learning, with limited resources available. The online curriculum expectations can be implemented at home, through online courses.

OBJECTIVE OF THE STUDY:

- 1) To understand the role of parent in online learning
- 2) To identify the difficulties faced by the parent in online learning
- 3) To analyse parent perception towards online learning

HYPOTHESIS OF THE STUDY:

H₁: Parent will create a relation with the concept of online learning

Null H₀: There is no significant relation between parent and online learning

Alternate H₁: There is significant relation between parent and online learning

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concerns of online learning, however they still tried and overcome the barriers, parent showed an immense role towards adoption of online learning, and still looking forward to continue with the same.

References

- Bhamani, S., Makhdoom, A. Z., Bharuchi, V., Ali, N., Kaleem, S., & Ahmed, D. (2020). Home Learning in Times of COVID: Experiences of Parents. *Journal of Educational Development*, 07 (01), 09-26. <https://files.eric.ed.gov/fulltext/EJ1259928.pdf>
- Paul, J., & Jefferson, F. (2019). A Comparative Analysis of Student Performance in an Online vs. Face-to-Face Environmental Science Course from 2009 to 2016. *Frontiers in Computer Science*. <https://www.frontiersin.org/articles/10.3389/fcsc.2019.00007/full>
- Zhao, Y., Guo, Y., Zhu, R., Su, W., Huang, L., Liang, D., et al (2020). The effects of COVID-19 on Homeschooling on Children, Parents, and Teachers of Grades 1-9 During the COVID-19 Pandemic. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7507793/>
- Hasan, S., (2020). Schools close, Children face a new conundrum. *Children's Health*. <https://www.dawn.com/news/1540682/schools-close-children-face-new-conundrum>



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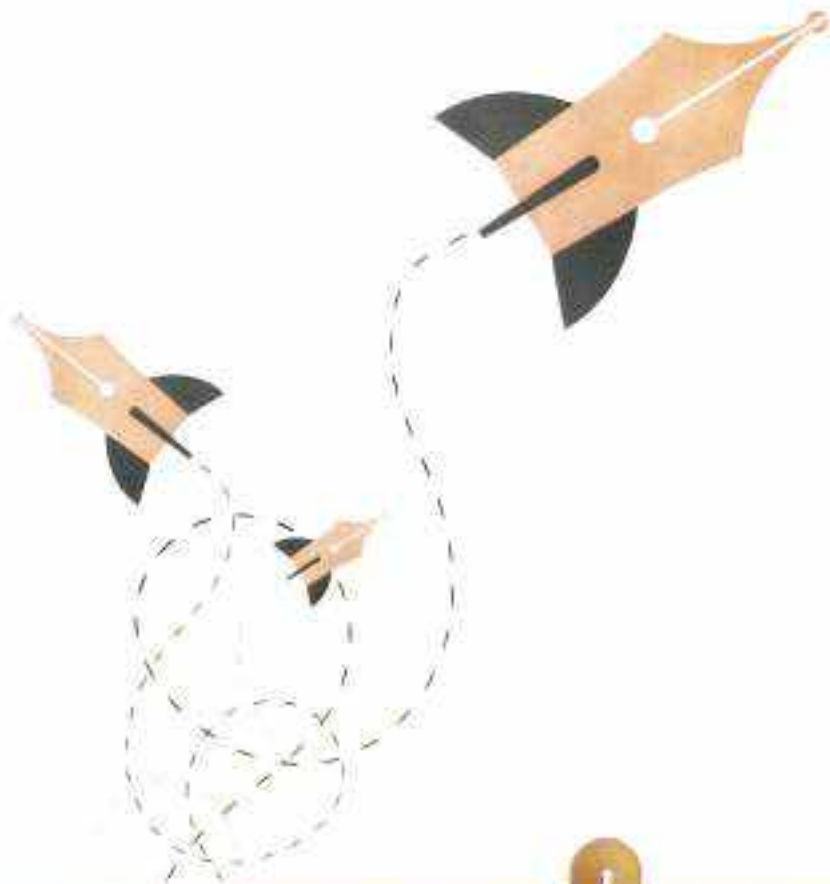
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MOBILE MARKETING: CUSTOMER RELATION WITH ONLINE SHOPPING APPLICATION THROUGH SMARTPHONE TECHNOLOGY, WITH REFERENCE TO COVID-19

Dr. Khan Suhana Begum Sanaula Shah

ABSTRACT

The world is very much familiar with the COVID 19 Pandemic situation; each and every sector was, and is affected. Many will raise hands on agreement that the world will take time for recovery. Though everything was shut down completely, but living was still constant, and human beings were dependent on their daily necessity as usual. What, how and in what quantity was a question for each and every one of us. The ones who were financially stable were looking forward for substitute ways to fulfil their desires, however the ones who were financially unstable, living is always been a challenge for them. We can't go out, but essentials can be delivered home, and here was the time maximum of us, maximum amongst use were getting inclined towards the use of online shopping applications through smartphone technology.

Keywords: Mobile Marketing, Customer, Online Shopping Application, Smartphone Technology.

Introduction:

We have already stepped into the world of digitalisation, emphasising on the concept of marketing moving from traditional form of marketing to modern was not that simple, but necessity or convenience may be one of the factors why a huge number of customers have adopted modernisation of marketing, to satisfying one's own need. Every coin has two faces, and so there are still many of us who conserved oneself in adopting modern way of buying things. Reasons may be many, lack of physical touch, quality assurance, trust and security factors, authenticity of the product and many in line. Though there were many good reasons on why, customers were not making use of online shopping applications, but it was the Pandemic situation which provoked customers in making use of the same, either for buying essentials, or paying utility bills, admission

fee, or medical expenses. In absence of alternative options customers who were not willing to switch their traditional way of dealing commercial areas, started making use of online applications.

Review of Related Literature:

(Musa, Saidon and Mior Harun, 2016), Study had placed importance on mobile marketing strategies, companies should place emphasis more and utilise mobile application which may not only help and organisation to expand but will also have an impact on sales. Reviving mobile marketing strategies will be favourable not only for companies but for customers as well.

(Sunitha, Gnanadhas, 2014), a general overview on online study, to understand customer preferences towards online shopping. Study concluded though traditional market have variety of products to display, but online provides platform to browse multiple products.

W. M. W., "The Predictors and Consequences of Consumers' Attitude Towards Mobile Shopping Application". *Procedia Economics and Finance* 37 (2016) pp: 447-452. <https://www.sciencedirect.com/science/article/pii/S2212567116301502>

- C.K. Sunitha, Gnanadhas. M.E., "Online Shopping-An Overview". (2014) https://www.researchgate.net/publication/264556861_Online_Shopping_-_An_Overview
- Shanthi. R. Kannaiah. Desti, "Consumer's Perception on Online Shopping". *Journal of Marketing and Consumer Research*, Volume 13, pp: 14-20

<https://researchonline.jcu.edu.au/39753/1/20Desti%20Consumers%20perception%20%20Online%20Shopping.pdf>

- Lim. Y. J, Osman. A, Salahuddin. A, Romle. A. R, Abdullah. S, "Factors Influencing Online Shopping Behavior: Mediating Role of Purchase Intention". *Procedia Economics and Finance* 35 (2016) pp: 401-410. <https://www.sciencedirect.com/science/article/pii/S2212567116000502>



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Noise Pollution in Palghar

Joshi Nitesh^{1*} and Mule Prachiti¹

DOI: 10.9734/bpi/ecees/v1/1998C

ABSTRACT

The current work was carried out during Ganesh festival which is a very popular festival in Maharashtra. Idols of lord Ganesh are brought to homes and also in public places. The idols the occasion is celebrated with huge pomp and splendour. On a normal working day and the final day of the festival, noise levels were measured at four different locations in Palghar Tehsil, a far western suburb of Mumbai city, using a sound level metre. Noise pollution indices as well as Noise Climate were computed. On both days, noise levels exceeded the central pollution control board's norms, with a noticeable increase in noise levels on the final day at all sites. On the Vaitarna site, the category of safe zone on festive and non-festive days was indicated. At 4 pm, 5 pm, and 6 pm time slots on festive days, Saphale site displayed a low to moderate risk zone category, while the rest of the time slots on festive days displayed a high risk zone category. On a festive day, the Boisar site indicated a high risk. On non-festive days, the Saphale, Palghar, and Boisar sites indicated safe zones, safe to low risk zones, and safe to moderate zones, respectively. Noise levels are not monitored by any agency in this area.

Keywords: Noise pollution; festival; L_{eq} ; Noise climate.

1. INTRODUCTION

Palghar, a town in Thane district, is 87 kilometres from Mumbai. The town is rapidly expanding and is classified as semi-urban because it has designated areas for agriculture and industry. Tarapur, which is part of the Maharashtra Industrial Corporation (Palghar), has little environmental monitoring. At regular intervals, the CPCB monitors the air and water in and around certain locations in Palghar. Attempts have been made to regulate noise levels; however, despite being a rapidly growing region, noise pollution in this area has not been studied. Noise is an unwanted sound that may cause some psychological and physical stress to human beings exposed to it. It is also considered as an environmental stressor and nuisance. Noise pollution has become an inevitable part of modern civilization. It is a fact that sound intensity above 80dB level is harmful to individual belonging to all ages [1-5]. An attempt has been made to investigate noise pollution during Ganesh Utsav, a well-known festival celebrated throughout Maharashtra. The festival lasts 11 days, culminating in Anant Chaturdashi. The Ganesh idol immersion procession lasts several hours and includes loud speakers, musical instruments such as drums, banjos, and cymbals, and firecrackers. This generates a significant amount of noise pollution. A Five-day noise monitoring study was conducted in Thane by MPCB [6] during Ganesh Festival. The result showed that the maximum noise level was 91.4 dBA and minimum noise level was 46.4 dBA. Considerable amount of increase in noise levels have been recorded on festival days in various parts of the country [7].

Noise imparts several effects on mental and physical health and results in disturbances in the daily activities. It affects living as well as non-living things [8]. Noise might affect sleep, conversation, causes hearing loss; in addition to these effects it also affects human judgment and performance [9]. Generally high exposure to noise level can cause annoyance, irritation, damage to auditory system, number of health related effects like physiological, psychological disorders, difficulties in daily activities and performances, hypertension and heart diseases [10]. Along with other types of pollution,

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noise has become a hazard to quality of life [11]. Various studies have revealed that noise levels in some of the Indian cities are higher than the standards prescribed by CPCB, Central Pollution Control Board and MoEF, Ministry of Environment and Forest, Govt. of India [12-17]. Several studies have been carried out in India on noise levels, noise climate, L_{eq} , and L_{max} [18-20].

The CPCB has notified air quality standards for noise which has been included as an air pollutant. Realizing the need to control and regulate noise levels, the Ministry of Environment and Forests, Government of India, have notified Standards and Guidelines for Noise Levels under Environment (Protection) Rules, 1986, known as Noise Pollution (Regulation & Control) Rules, 2000 as shown in Table 1. The objective of the study is to assess the noise pollution levels, noise climate, L_{eq} , and L_{max} , Noise Pollution Level Index and Noise Climate in this industrial area.

Table 1. Ambient permissible noise levels in India as per prescribed by CPCB

Area code	Category	Limits in DbA	
		Day time	Night time
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence zone	50	40

2. MATERIALS AND METHODS

2.1 Study Area

Palghar is one of the far Western suburbs of Mumbai city Fig. 1. Population of Palghar is 5, 50,222 (Palghar, 2011). Residential colonies and built up areas are very well developed near railway line zones. Current study was carried out at four different sites in Palghar tehsil viz. Vaitarna, Saphale, Palghar and Boisar. Out of these four sites Saphale is a developing area while Palghar and Boisar are very well developed due to the presence of MIDC (Maharashtra Industrial Development Corporation) in the close vicinity. Due to the geographic restriction Vaitarna is a small undeveloped village with many settlements.

In the current study, noise levels on a normal day and on the last day (Anant Chaturdashi) of Ganesh festival were observed. The main objective of the study was to monitor and evaluate the fluctuating noise level in the different parts of the study area.

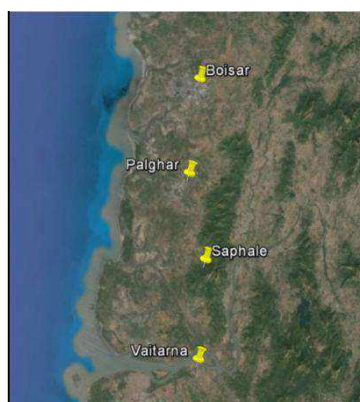


Fig. 1. Map showing sampling points

2.2 Instrument Used

Sound level meter of Lutron Electronics (Model number: - SL 4010) was used to monitor sound levels at all the sites mentioned above. The readings were measured in dB (A) unit, where A denotes the “A

weighting” characteristic which is simulated as "Human Ear Listing" response. The time weighting is adjusted to “Fast” by default. The sound level meter is provided with high sensitivity Bruel and Kjaer Prepolarized Condenser Microphone (Type 4226) at the top and readings are generated on the horizontal display.

2.3 Sampling Methodology

While recording the noise levels, the sound level meter was placed at 1 to 1.2m above the ground surface level and one meter away from sound source, then microphone of sound level meter was pointed towards the source of sound and readings were noted down. To minimize the error, readings were taken continuously for 30 minutes at an interval of 2 minutes. The noise levels were recorded on Saturday, 28th September 2012 the last day of the festival and Monday, 17th September 2012, a normal working day. The reading were taken from 4pm to 9 pm from 4 to 4.30 pm, 5 to 5.30 pm, 6 to 6.30 pm , 7 to 7.30 pm, 8 to 8.30 pm and 9 to 9.30 pm. L_{eq} was calculated using following formula

$$L_{eq,T} = 10 \log \left[\frac{1}{n \sum_{i=1}^n 10^{L_i/10}} \right]$$

Where, L_{eq} = noise levels observed in time interval T and $n = n^{th}$ duration of measurement [21].

L_{eq} is the equivalent continuous equal energy level; and can be applied to any fluctuating Noise Level. It is that constant Noise Level that over a given time expends the same amount of energy as the fluctuating level over the same time period [22]. The readings noted in fractions, were rounded off to nearest integer in the observation tables. To detect the actual rise in the noise level a set of readings was taken on a normal working day. To get better understanding of noise range noise climate (NC) index [23] was calculated using following formula: $NC = L_{10} - L_{90}$ dB (A).

Total annoyance caused by noise level was estimated using noise pollution level index (NP) [24]: $LNP = L_{eq} * 2.56\delta$

Where, LNP = Noise pollution level, L_{eq} = equivalent noise level, δ = standard deviation

Statistical analysis was carried out to analyse the significant difference between festive and a non-festive day.

3. RESULTS AND DISCUSSIONS

Deviation of noise from its mean point and L_{10} , L_{50} , L_{90} values are shown in Table 2. Table 3 and Table 4 show the equivalent noise (L_{eq}) maximum noise (L_{max}) and minimum noise (L_{min}) recorded at all four sites at different time slots on festive and non-festive day respectively. On festive day fluctuation of noise was more in comparison to non-festive day. On the festive day, 9 pm time slot at Vaitarna showed a decrease in the noise levels as compared to other slots in the same area. Sound levels on all other sites at all the time slots exceeded the permissible limit. On the normal working day i.e. non - festive day sudden depletion in the noise levels was observed. Vaitarna site remained noiseless for all the time slots. Palghar site was the noisiest followed by Boisar and Saphale.

87 dB (A) at 7pm and 69 dB (A) at 5pm in Palghar were the highest L_{eq} , while 53 dB (A) in at 9pm and 42 dB (A) at Vaitarna were the lowest L_{eq} recorded on festive and non-festive days respectively. The continuous monitoring showed the broad fluctuating range. Saphale site showed acute fluctuation followed by Boisar, Palghar and Vaitarna.

L_{10} and L_{90} are defined as peak and back-ground sound levels over certain measurement duration [25]. On festive and non-festive days L_{10} values for Vaitarna, Saphale, Palghar and Boisar site differed by 5 - 10 dB (A), 20 – 27 dB (A), 19 – 20 dB (A) and 15 – 25 dB (A) respectively, whereas the range of fluctuation of L_{90} value for Vaitarna, Saphale, Palghar and Boisarsite was 6 -12 dB(A), 20 – 24 dB(A), 16 – 19 dB(A) and 27 – 33 dB(A) respectively. Highest difference in standard deviation of festive and non-festive day was recorded at Saphale site and least deviation was seen at Palghar site.

Table 2. Different noise parameters on festive and non-festive days

4:00 PM										
Site	Festive day					Non- festive day				
	Mean	SD	L ₁₀	L ₅₀	L ₉₀	Mean	SD	L ₁₀	L ₅₀	L ₉₀
Vaitarna	57	2	61	57	55	44	4	51	45	40
Saphale	76	3	80	76	72	52	3	57	51	50
Palghar	76	3	81	77	72	63	2	68	63	63
Boisar	80	2	84	79	78	55	3	60	54	52
5:00 PM										
Site	Festive day					Non- festive day				
	Mean	SD	L ₁₀	L ₅₀	L ₉₀	Mean	SD	L ₁₀	L ₅₀	L ₉₀
Vaitarna	59	2	62	59	57	47	3	52	46	46
Saphale	77	3	82	78	74	54	3	59	53	52
Palghar	81	3	87	80	79	68	2	72	67	67
Boisar	80	2	86	80	79	57	4	63	57	54
6:00 PM										
Site	Festive day					Non- festive day				
	Mean	SD	L ₁₀	L ₅₀	L ₉₀	Mean	SD	L ₁₀	L ₅₀	L ₉₀
Vaitarna	59	2	63	58	58	46	3	52	45	45
Saphale	79	3	86	78	77	55	3	60	54	52
Palghar	83	5	88	85	78	61	5	71	60	58
Boisar	80	2	85	80	79	54	5	63	52	52
7:00 PM										
Site	Festive day					Non- festive day				
	Mean	SD	L ₁₀	L ₅₀	L ₉₀	Mean	SD	L ₁₀	L ₅₀	L ₉₀
Vaitarna	58	1	60	58	57	53	2	57	52	52
Saphale	84	5	89	85	78	48	2	53	48	46
Palghar	86	3	91	85	83	59	3	66	58	57
Boisar	80	2	85	80	78	55	4	62	55	52

8:00 PM										
Site	Festive day					Non- festive day				
	Mean	SD	L ₁₀	L ₅₀	L ₉₀	Mean	SD	L ₁₀	L ₅₀	L ₉₀
Vaitarna	59	2	63	58	56	41	4	48	40	38
Saphale	81	8	88	84	71	62	4	70	62	58
Palghar	85	2	89	85	82	62	4	69	61	60
Boisar	83	2	87	84	80	55	7	72	52	51

9:00 PM										
Site	Festive day					Non- festive day				
	Mean	SD	L ₁₀	L ₅₀	L ₉₀	Mean	SD	L ₁₀	L ₅₀	L ₉₀
Vaitarna	53	2	57	53	50	41	3	46	41	39
Saphale	82	9	89	86	69	50	4	55	52	44
Palghar	83	3	88	84	79	55	3	61	54	54
Boisar	83	3	86	84	79	51	5	59	50	45

Table 3. Noise levels on festive day (Anant Chaturdashi)

	4:00 PM			5:00 PM			6:00 PM			7:00 PM			8:00 PM			9: 00 PM		
	L _{eq}	L _{max}	L _{min}	L _{eq}	L _{max}	L _{min}	L _{eq}	L _{max}	L _{min}	L _{eq}	L _{max}	L _{min}	L _{eq}	L _{max}	L _{min}	L _{eq}	L _{max}	L _{min}
Vaitarna	58	61	54	59	62	56	59	63	57	58	63	56	59	64	54	53	57	50
Saphale	76	80	71	78	83	72	80	87	76	86	90	72	84	88	61	85	89	60
Palghar	77	81	72	82	87	79	85	89	71	87	92	81	86	89	81	84	89	78
Boisar	80	87	78	81	88	79	81	88	79	81	86	78	84	87	79	83	86	77

Table 4. Noise level on non-festive day (Normal working day)

	4:00 PM			5:00 PM			6:00 PM			7:00 PM			8:00 PM			9: 00 PM		
	L _{eq}	L _{max}	L _{min}	L _{eq}	L _{max}	L _{min}	L _{eq}	L _{max}	L _{min}	L _{eq}	L _{max}	L _{min}	L _{eq}	L _{max}	L _{min}	L _{eq}	L _{max}	L _{min}
Vaitarna	46	52	39	48	56	46	49	58	45	53	60	52	43	50	38	42	48	38
Saphale	53	62	51	55	63	52	56	61	51	49	56	46	65	72	58	52	56	43
Palghar	65	72	63	69	75	67	66	77	58	62	71	57	66	76	60	57	64	52
Boisar	56	64	51	59	67	53	62	72	52	58	67	51	64	73	50	54	59	45

Table 5. Noise pollution level (NP) on Festive and Non-Festive days

Time	Festive day	Festive day	Festive day	Festive day	Non festive day	Non festive day	Non festive day	Non festive day
	Vaitarna	Saphale	Palghar	Boisar	Vaitarna	Saphale	Palghar	Boisar
4:00 PM	62.49	83.36	83.70	86.08	56.82	61.12	70.92	63.84
5:00 PM	63.45	85.84	88.87	87.31	55.01	62.07	74.05	68.08
6:00 PM	63.54	88.23	96.83	87.16	57.42	62.67	78.92	73.84
7:00 PM	61.47	97.84	94.70	87.01	58.76	55.23	70.51	67.42
8:00 PM	65.18	103.93	91.83	89.44	52.01	74.55	75.36	82.05
9:00 PM	58.82	108.19	91.18	90.77	48.21	62.30	63.85	67.86

Table 6. Noise climate (NC) index of sampling points

NC	Festive day	Non festive day	Festive day	Non festive day	Festive day	Non festive day	Festive day	Non festive day
	Vaitarna	Vaitarna	Saphale	Saphale	Palghar	Palghar	Boisar	Boisar
4:00 PM	5.76	11.45	7.63	7.00	7.70	5.75	8.04	7.80
5:00 PM	4.70	5.70	7.90	6.60	7.55	5.55	6.55	9.40
6:00 PM	5.10	7.25	8.90	8.30	10.35	13.10	6.00	10.55
7:00 PM	3.10	5.15	11.10	6.15	8.45	8.55	7.00	10.15
8:00 PM	6.55	9.95	17.05	11.80	7.00	9.30	6.55	21.15
9:00 PM	6.50	7.40	20.00	11.15	8.40	7.30	6.80	13.90

4. CONCLUSION

On festive days high and comparatively steady noise levels were recorded and analysed using noise pollution level index (Table 5). Comparative analysis of noise using noise pollution level index indicated that Saphale is the noisiest site while Vaitarna is least noisy site of the study area. Palghar and Boisar site show moderate noise pollution and less fluctuation as compared to Saphale site. Equivalent noise levels of festive days were high as compared to the non-festive days on all sites but majority of time slots of all sites showed high noise climate (NC) index on non-festive days (Table 6). Main reason behind this is wide fluctuation range of noise on non-festive days. According to different categories of noise risk zones [25], L_{eq} values of all sites were assessed to find out level of risk due to high noise levels (Table 7). Vaitarna site indicated the category of safe zone on festive and non-festive day. Saphale site exhibited low to moderate risk zone category for 4pm, 5pm and 6 pm time slot for festive days and for rest all time slots of festive day it showed the category of high risk zone. For Palghar site festive day time slot of 7pm and 8pm showed extremely high risk while rest all slots showed risk categories between moderate to high. Boisar site indicated high risk on festive day. On non-festive day Saphale, Palghar and Boisar site indicated safe zone, safe to low risk zone and safe to moderate zone category respectively.

Table 7. Noise risk zone

Intensity of noise in dB (A)	Category of zones
< 66	Safe
66 – 71	Tolerable
71 – 76	Low risk
76 – 81	Moderate risk
81- 86	High risk
> 86	Extremely high risk

[25]

The Ganesh festival is celebrated with great enthusiasm in all areas of Palghar tehsil. On the day of Anant Chaturdashi (Last day of the festival), immersion procession includes immersion of idols from houses as well as from community groups. The procession involves use of loudspeakers, banjos and firecrackers and continues till hours, this affects the usual sound level. People are often unaware of the consequences of the noise pollution on the human health and environment. Hence it is essential to create awareness amongst the community about the impacts of noise pollution. Restriction from local governments such as defined time limit for procession, limitation on the use of loud musical instruments can also help in controlling the noise pollution.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Singh NU, Deepak S. Study of noise pollution levels during a Hindu festival in Dhar Town, MP, India. *Research Journal of Chemical Sciences*. 2013; 3(12):71-75.
2. Mahecha GS, Bamniya BR, Kapasya V, Meena RS. Noise pollution monitoring during Diwali festival in Golden city Jaisalmer of Rajasthan, India. *The Environmentalist*. 2012;32(4):415-9.
3. Ahirwar AV, Bajpai S. Assessment of noise pollution during Deepawali festival in Raipur City of Chhattisgarh, India. In *International conference on chemical, environmental and biological sciences (CEBS-2015)*. 2015;88-90.
4. Patel NL, Bhave PP. Study of noise pollution during deepawali festival. *International Journal of Innovative Research in Advanced Engineering (IJRAE)*. 2014;1(6):2349-163.
5. MPCB. 2012. Report on ambient noise monitoring during Ganesh festival 2012. Mumbai.
6. Bhagawat PH, Meshram P. Study of Noise Pollution during Ganesh Utsav in Yavatmal City. *International Journal of Pharmaceutical and Chemical Sciences*. 2:496-499.

7. Pawar CT, Joshi MV. Urban development and sound level in Ichalkaranji City, Maharashtra. *Indian J. Environ. And Ecoplan.* 2005;10:177–181.
8. Kumar S. Assessment of Urban Noise Pollution in Vijayawada City, A.P, India. *International Journal of Earth Sciences and Engineering.* 2011;459-464.
9. Canter LW. *Environmental impact assessment.* USA- McGraw Hill Publishers. New York; 1996.
10. Davar NS. Noise Pollution- Sources, Effects and Control. *J. Hum. Ecol.* 2004;16:181-187.
11. Naik S, Purohit K. Traffic noise pollution at Bondamunda of Rourkela Industrial Complex. *Pollution Research.* 1999;18:475- 478.
12. Mohan S, Dutta N, Sarai S. Subjective Reaction to Road Traffic Noise of Resident Living in Delhi City. *Pollution Research.* 2000;19:353-356.
13. Gupta A, Chakraborty R. An integrated Assessment of Noise Pollution in Silchar, Assam, North East India. *Pollution Research.* 2003;22:495-499.
14. CPCB. *Ambient Air and Noise Pollution Levels - Deepawali 2012.* Delhi; 2012.
15. Joshi A, Rane P. Monitoring noise levels of vehicular traffic on Mumbai roads. *International journal of research;* 2012.
16. Mangalekar S, Jadhav A, Raut P. Study of Noise Pollution in Kolhapur City, Maharashtra, India. *Universal Journal of Environmental Research and Technology.* 2012;2:65- 69.
17. Kumar R, Somshekhar R. Status of Noise Level in Bangalore City. *Journal of Environment and Pollution.* 2001;8:197–199.
18. Nikhilkumar, et al. Study on Noise Pollution level in Parks of Allahabad City, India. *International Research Journal of Environment Sciences.* 2013;2(8):88-90.
19. Chaudhari A, Debsarkar A, Chakraborty S. Analysis of day time traffic noise level: A case study of Kolkata, India. *International Journal of Environmental Sciences and Research.* 2012;114–118
20. Tandel B. McWan J, Ruparel P. *International Conference on Environment and Industrial Innovation IPCBEE.* IACSIT Press, Singapore; 2011.
21. Saler P, Vibhute S. Ganeshotsav – A festival of noise. *Journal of Engineering Research and Studies.* 2012;81-83.
22. MPCB. 2005. *Noise Pollution Scenario in Maharashtra during Diwali- 2005.* Mumbai.
23. Pathak VT. Dynamics of traffic noise in a tropical city Varanasi and its abatement through vegetation. *Environmental Monitoring and Assessment.* 2008;67-75.
24. Ehrampoush, et al. Noise Pollution in Urban Environments: A Study in Yazd City, Iran. *Pol. J. Environ. Stud.* 2011;21:1095- 1100.
25. Banerjee DC. Appraisal and mapping the spatial – temporal distribution of urban road traffic noise. *International journal of environmental science.* 325–335.
26. Tehsil Office. *Talukaaadarshakta, Palghar.* Palghar; 2011.
27. Alam W. GIS based Assessment of Noise Pollution in Guwahati City of Assam, India. *International Journal of Environmental Sciences.* 2011;2:731-740.

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STUDIES ON FOLIAR SOUND ABSORPTION CAPACITIES OF SOME URBAN TREES BY IMPEDANCE TUBE METHOD

AMBIKA JOSHI, VISHWAS DESHMUKH , NITESH JOSHI AND PAYAL RANE

Abstract

Noise pollution is a common problem in urban areas with ever increasing vehicular density. Urban trees help in noise attenuation. Various methods are employed to measure sound absorption coefficients of substances. Sound absorption coefficient is normally measured using expensive instruments and calculating absorption coefficients. The absorption coefficient of a substance falls within a scale from 0 to 1. The concept of this absorption coefficient was established by Sabine. In the current work sound absorption ratios of leaves of some tree species are derived using an impedance tube, function generator, standard audio amplifier, omnidirectional microphone and oscilloscope connected together. A sound absorption ratio was derived to measure sound absorption on a relative scale in a closed system calculate sound absorption ratio Sabine's formula was used and absorption ratio was derived. Sound absorption ratio towards unity indicates poor sound absorption capacity. Sound absorption ratio of leaves of different tree species was studied. Observations were made using oscilloscope connected to a long impedance tube and a speaker at different frequencies like 500Hz, 700Hz etc. In designing the tube 500Hz \square 1000Hz was taken as operating frequency for the reverberation testing and used in sound absorption test. To reduce the effect of attenuation due to walls of tube it was desired to have a large diameter of tube and long length so that at least two minima and one maximum could be found. An omnidirectional microphone was used to study standing pattern. Readings were taken with and without samples so that every time when samples were replaced by the other the initial setting was not disturbed. Initial setting wave pattern was maintained by adjusting i/p power (i.e. current & voltage) of the speaker. At 500Hz the noise levels are closer to audible range, hence it was used as reference and for comparison of absorption by plants at other frequencies. According to the study, leaves of different plant species showed different absorption at different frequencies. Barringtonia acutangulaGoerb, Eucalyptus globulusLabill, Ficus benghalensisL, Ficus glomerataRoxb, Ficus religiosa L, Mangifera indicaL, Polyalthia longifoliaThev, Sterculia urensL and Thespesia populnea Soland are good sound absorption the method is relatively inexpensive and easy to use to measure sound absorption of foliar surfaces.

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9. Role of *Ipomoea carnea* in Phytoremediation of Heavy Metals

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ABSTRACT

Land in industrial areas receives many solid wastes, including heavy metals. Metals taken up by the plants are incorporated into their tissues depending upon their mobility within the plant. The surplus of heavy metals can severely reduce growth and biomass production in plants.

To understand the fate of some heavy metals in plants, five heavy metals were chosen for their interactions with *Ipomoea carnea* jacq. Subsp. *fistulosa* which is an exotic weed distributed in tropical countries of Asia and America migrated from the American tropics into India. The species is then supposed to have escaped and naturalised elsewhere. As *Ipomoea carnea* is found growing everywhere including waste dumps. The selected heavy metals were Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb) and Zinc (Zn).

Five concentrations of each of the heavy metals were selected to provide a range and meanwhile, control was also set up. The plants were grown for 6 and 9 weeks period. The concentrations of heavy metals were determined using Atomic Absorption Spectrophotometer method (AAS).

The study concluded that if plants were grown for a short period or limited period they may help in improving the quality of soil by effectively removing the heavy metal but continued growth leads to a stage of equilibrium between metal concentrations in and out of plant organs. The Potential of *Ipomoea carnea* to effectively absorb the metals is $Zn > Cd$; $Pb > Cu > Cr$ and retain them is $Cd > Zn$; $Pb > Cu > Cr$.

Keywords: *Ipomoea carnea*, bioremediation, heavy metals.

1. INTRODUCTION

A deteriorating environment is one of the major issues that we face today. Any modification in the physical or biological component of the surrounding which could be harmful to organisms is known as pollution. A harmful substance introduced in the ecosystem as a result of human activity has the potential to get accumulated to harmful levels. There are several reasons for the occurrence of pollution, the major one being urbanization. Intensive urban growth and industrialization started increasing the level of pollution converting our landscapes into vessels of waste. Developmental activities have depleted our natural resources and generated a huge amount of wastes leading to the pollution of air, water and soil. Untreated waste (sewage) plays a major role in the pollution of rivers causing loss of productivity and environmental degradation.

1.1. Types of Pollutants

Biological pollutants: These pollutants include pollen, microbes, viruses, dust mites, insects, several parasites and pathogens and invasive species documented from various sources. (Elliott M., 2003).

Organic pollutants: Usually substances that are biodegradable fall under the category of organic pollutants. They are naturally occurring in the environment but excessive demand has led to massive production causing them to be a cause of concern. PCB - Polychlorinated biphenyls, PAH - polycyclic aromatic hydrocarbons, PBDE - polybrominated diphenyl ethers, petroleum and OCP - organochlorine pesticides are a few that become major pollutants. (El-Shahawi M.S. et al., 2010).

Inorganic pollutants: Metals, salts and substances of mineral origin are considered to be inorganic pollutants. (Wong M.H., 2012). These pollutants can be found naturally but various anthropogenic activities such as metallurgy, smelting and mining processes have introduced them into the environment at higher levels.

Heavy metals: "Heavy metals" is a general collective term, which applies to the group of metals and metalloids with an atomic density greater than 4 g/cm³, or 5 times or more, greater than water (Nriagu and Pacyna 1988). Heavy metals present naturally in trace amounts are arsenic, cadmium, chromium, cobalt, lead, mercury, nickel and selenium are toxic even at very low concentrations, whereas few heavy metals such as Cu, Zn and Fe are of biological importance and growth, however at high concentrations, can cause damage to the organism by accumulating and displacing vital nutrients in the tissues.

Sources of heavy metals in the environment: Heavy metals are released from natural as well as manmade activities. Natural sources of heavy metals are volcanic eruptions, forest fires, weathering of rocks and sea-salt sprays, whereas the anthropogenic processes include vehicular exhaust, burning of fossil fuels, industrialization, insecticides used in agriculture, metallurgy, mining, smelting, and wastewater.

Heavy metals in soil and Effect on agricultural productivity:

Soil and water are both indispensable factors of an ecosystem that are essential for the growth and development of living organisms. An impact on the composition of soil has a corresponding and directly proportional effect on the water resources. The composition of parent rock, degree of weathering and climatic conditions are responsible for the release of heavy metals into the soil. (Arunakumara K. K. I. U. et al., 2013). Heavy vehicular traffic in urban areas is one of the major factors for the contamination of soils with heavy metals. The fate of these heavy metals in the environment is dependent on their bioavailability for their uptake by plants. Phytoavailability of metals plays an important role in the assessment of metal-contaminated sites, the metal availability depends upon the source, metal speciation, pH and other physicochemical properties of soils. (Wuana R.A. and Okieimen F.E., 2011). Agricultural productivity and food safety are solely dependent on the quality of soil and water. Thus making the monitoring of agricultural practices necessary to ensure food safety. The presence of heavy metals in soil and water hampers agricultural production, subsequently lowering the quality and quantity of the yield, consequently affecting the health of consumers. Several studies have reported that crops such as *Oryza sativa*, *Zea mays* and *Brassica juncea* absorb heavy metals and accumulate them in the plant body thus posing a threat to the health of the consumers. (Murakami M.N. 2007; Meers, E. et al., 2010, Bittner, O.P. et al., 2012).

1.2. Impact of Heavy Metals on Human Health

Phytoremediation of heavy metals: Soil, water and air are the components of the environment that are being affected by the presence of an excessive amount of heavy metals. Industrial activities and runoff of fertilizers and pesticides from agricultural land, sewage water irrigation and coal combustion lead to soil and water contamination by heavy metals. Soils act as a reservoir for heavy metals released into the environment, causing a significant environmental problem with a negative impact on human health and agriculture.

Several physical and chemical methods have been used to clean up the soils of heavy metals, but most of them are expensive and tedious, therefore an alternative, effective and cheap method of soil cleanup is required. Phytoremediation is a concept that uses green plants to remove environmental contaminants. (Cunningham, S.D. & Berti, W.R. 1993; Raskin I. et al., 1997). Phytoremediation is a useful technique for recovering soils containing metal pollutants, utilizing hyperaccumulator plants. The term "hyperaccumulator" is used to describe plants with the ability to tolerate and grow in metalliferous soils, they can extract and accumulate high amounts of heavy metals without enduring toxic impact on the plant health. These plants accumulate 10 to 500 times more metals than ordinary plants. (Chaney R. L. et al 1997). Approximately 500 plant species have been reported in a total based on their extent

of accumulating heavy metals. (Kramer U., 2010). Phytoremediation includes the following mechanisms for the removal of heavy metals such as rhizofiltration, phytoextraction, phytostabilization, phytovolatilization and phytodegradation.

TABLE 1: Major heavy metal pollutants, their sources and effects on humans. (SOURCE: Pallavi Menon 2020)

Heavy metal	Sources	Effects
Arsenic (As)	Fungicides. Metal smelters Pesticides.	Bronchitis Dermatitis Poisoning
Cadmium (Cd)	Cd and Ni batteries Electroplating Nuclear fission plant Pesticides & fertilizer Welding	Gastrointestinal disorder Hypertension Lung disorder and cancer Osteomalacia & Osteoporosis Renal dysfunction
Chromium (Cr)	Electroplating Industry - Leather, Textile, Stainless Steel and Alloys, Paints, Pulp and Paper. Mining	Bronchitis Damage to the nervous system Dermatitis Fatigue Kidney disorders Weakened immunity
Copper (Cu)	Chemical industry Metal piping Mining Pesticide production	Anemia Gastrointestinal Irritation Liver and kidney damage.
Iron (Fe)	Construction Pipe making Steel manufacturing	Chronic inhalation may cause a benign pneumoconiosis Conjunctivitis & retinitis Lung cancer
Lead (Pb)	Automobile emission Burning of coal Mining Pesticide & paint Smelting	Congenital paralysis Damage to the nervous system Fatal infant encephalopathy Mental retardation & developmental delay in children
Mercury (Hg)	Batteries Paper industry Pesticides	Damage to the nervous system Gingivitis Minor psychological changes Protoplasm poisoning Spontaneous abortion Tremors
Zinc (Zn)	Brass manufacture Metal Plating Plumbing Refineries	Corrosive effect on the skin Damage to the nervous membrane

Rhizofiltration: It is the Uptake of heavy metals from wastewater by absorption done by plants roots. (Prasad and Freitas, 2003)

Phytoextraction: In this technique, plants extract metals from soil; the uptake is through the roots and is translocated to the shoots. (Salt D.E. et al., 1995; Chaney R.L. et al., 1997). Hyper accumulators absorb the metals from contaminated sites. The recovery of the extracted metals is also a viable option by harvesting the plants appropriately and incinerating them later. Apart from being able to tolerate high amounts of heavy metals phytoextraction species have an expansive root system and a rapid rate of growth. (Marques et al., 2009).

Phytovolatilization: In this process, plants are used to extract soluble contaminants from soil by the roots, transported to the leaves and then released into the atmosphere by volatilization. (Tollsten L. and Muller P., 1996). Selenium metal is volatilized plants, after its conversion to dimethyl selenide by microorganisms and algae. (Neumann P.M. et al., 2003). However, in this technique, the amount of the contaminant transpired is dependent on the water flow, which could be low in field conditions.

Phytostabilization: In this process, the contaminants are stabilized by the plant roots by immobilizing them; this is achieved by binding them to soil particles, microbial interaction, accumulation and precipitation in the roots. As a result, the migration of contaminants in the soil and water is reduced.

Phytodegradation: Phytodegradation is a method in which organic contaminants are broken down due to metabolic processes by enzymes such as dehalogenase, oxygenase and reductase into simpler molecular forms which are incorporated into the plant tissues (Black H, 1995; Salt D.E. et al., 1998; Chaudhry T.M. et al 1998). These enzymes can break down organic pollutants found in herbicides.

Plants used for phytoremediation: Certain plants from Fabaceae, Brassicaceae, Asteraceae, Euphorbiaceae families have been identified to have the potential to uptake heavy metals. Plants of *Brassica juncea* accumulated a concentration of lead up to 500mg/L. (Ghosh M. and Singh S. 2005), *Helianthus annuus* L. and *Salix alba* L. (Borišev M. et al., 2012).

In the current work the use of *Ipomoea carnea*. Jacq a common weed in the country is used to explore its potentials in remediating some heavy metals. The metals Cadmium, Chromium, Copper, Lead and Zinc were supplied to the plant and their concentrations were determined post-harvest.

2. MATERIALS AND METHODS

Cuttings of *Ipomoea carnea* were planted in polythene bags. These bags contain soil mixed in the proportion of three parts of reading loam to one part of farmyard manure. 250 ml of water was given to each bag daily. After the first five days needed for the establishment of the cuttings, the plants were subjected to 250 ml of the test solution of heavy metals, every third day. One set was maintained as a control, to which identical amounts of only water were administered. Identical watering schedules were maintained for all the sets of plants.

The design of treatment is given below:

TABLE 2: Schedule of treatments of *Ipomoea carnea* with heavy metals (12 replicates each)

Metal	Cadmium		Chromium		Copper		Lead		Zinc	
	45	60	45	60	45	60	45	60	45	60
Concentration in ppm	/	/	/	/	/	/	/	/	/	/
15	/	/	/	/	/	/	/	/	/	/
50	/	/	/	/	/	/	/	/	/	/
150	/	/	/	/	/	/	/	/	/	/
300	/	/	/	/	/	/	/	/	/	/
500	/	/	/	/	/	/	/	/	/	/
Control	/	/	/	/	/	/	/	/	/	/

The plants were harvested at 6 and 9 weeks and morphological parameters were recorded along with heavy metal concentrations in the roots and leaves. For the sake of our convenience, we have discussed the concentrations of the heavy metals in the tissues, which were measured using atomic absorption spectrophotometer.

Digestion procedure: 1gm of dried sample was taken in an evaporating dish. 10 ml of conc. HCL and 10ml of conc. HNO₃ was added to the sample. The evaporation dish was then placed on the burner and heated till completely dry. The evaporating dish was allowed to cool and 10 ml of conc. Perchloric acid was added and heated till dense white fumes appeared. Further 5ml of Conc. HCL and 20 ml Distilled water was added and the evaporating dish was placed on a hot plate for 30 min. The evaporating dish was then cooled and its content was removed in a 50 ml volumetric flask and the final volume was made up to 50 ml using distilled water. The solution was filtered using a Whatman filter paper No.1. Finally, the sample was aspirated in the Atomic Adsorption Spectrophotometer. (Levenson R., 2001)

3. RESULTS AND DISCUSSIONS

3.1. Metals in Leaves and Roots

Cadmium: The 6-week old plants showed that the roots contained a very high amount of Cadmium as compared to the leaves. The 9-week old plants showed that with a longer duration of treatment, the Cd content of the leaves decreased except for 15 ppm treatment. Cd content of roots increased at longer durations.

Chromium: The 6-week old plants showed that the roots contained more Cr at the lower concentrations, 15 ppm and 50 ppm and the leaves contained more Cr at the higher concentrations 150 ppm, 300 ppm, and

500 ppm. The 9-week old plants showed that with a longer duration of treatment, the Cr content of the leaves decreased, except for 500 ppm, and the chromium content of the roots increased except for 15 ppm treated plants. In general, it can be said that the 9-week old plants showed that the roots contained more chromium than the leaves.

TABLE 3: Concentration of Heavy Metals in Leaves after 6 weeks of treatment.

Concentration in ppm	Cad	Cr	Cu	Pb	Zn
0	0	0	4	2	32
15	23	0.5	26	25	55
50	52	0.9	47	70	75
150	63	3.7	130	190	120
300	125	3.9	245	275	260
500	78	3.8	282	482	355

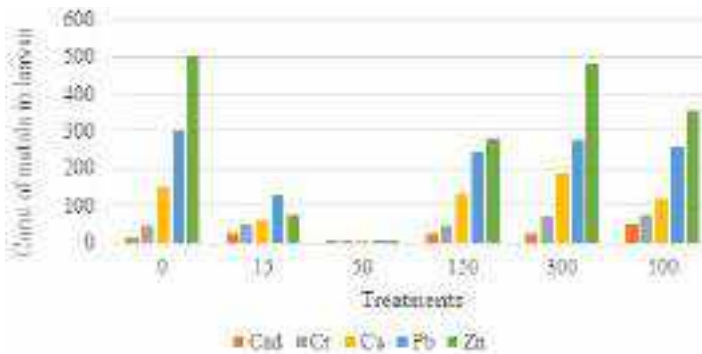


FIGURE 1: Concentration of Heavy Metals in Leaves after 6 weeks of treatment.

Copper: The 6-week old plants showed that the leaves contained a higher amount of Cu than in the roots. The 9-week old plants showed that the Cu content of the leaves decreased and that of the roots increased except in 500 ppm treated plants.

Lead: The 6-week old plants showed that the leaves contained a very high amount of Pb as compared to the roots. The 9-week old plants also showed a similar trend except at 500 ppm Pb treatment where the Pb content of both leaves and roots were nearly the same. There seemed to be a decrease in the Pb content of both leaves and roots, with a longer duration of 9 weeks.

Zinc: The 6-week old plants showed that the leaves contained a very high amount of Zn as compared to the roots. Analysis after 9 weeks showed that the metal contents of the roots of 15ppm, 300 ppm, and 500 ppm treated plants were higher than those of the leaves and in 50ppm

and 150 ppm treated plants the Zn contents in leaves were higher than in the roots. A longer duration of 9 weeks resulted in a decrease in the Zn contents of roots, except in 150ppm and 300ppm treated plants where a decrease in Zn contents of the roots was noted.

TABLE 4: Concentration of heavy metals in leaves after 9 weeks of treatment.

Concentration in ppm	Cad	Cr	Cu	Pb	Zn
0	0	0	2	5	26
15	20	0.2	5	28	32
50	17	0.5	27	30	67
150	22	0.8	48	100	95
300	42	3.6	42	195	100
500	24	5.9	73	140	128

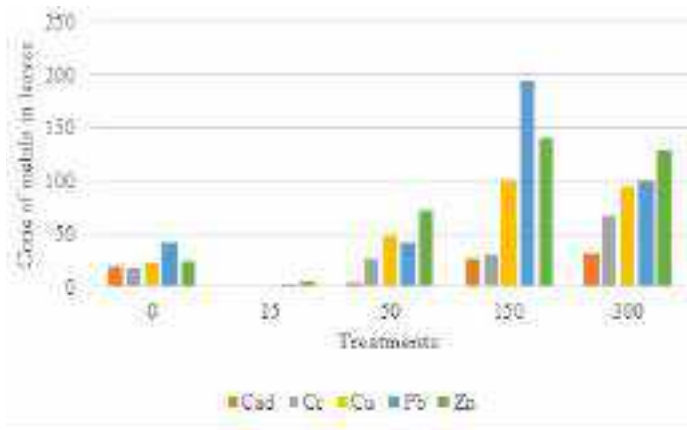


FIGURE 2: Concentration of heavy metals in leaves after 9 weeks of treatment.

TABLE 5: Concentration of heavy metals in roots of *Ipomoea carnea* after 6 weeks of treatment in ppm

Concentration in ppm	Cad	Cr	Cu	Pb	Zn
0	0	1	5	1	25
15	30	1.2	23	25	27
50	50	2.2	27	20	48
150	175	2.8	48	40	90
300	220	3.7	72	80	126
500	340	2	110	160	155

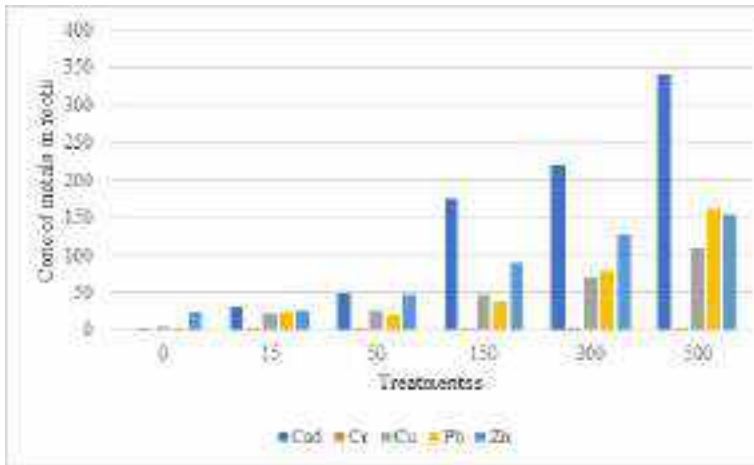


FIGURE 3: Concentration of heavy metals in roots of *Ipomoea carnea* after 6 weeks of treatment in ppm.

TABLE 6: Concentration of heavy metals in roots of *Ipomoea carnea* after 9 weeks of treatment.

Concentration in ppm	Cad	Cr	Cu	Pb	Zn
0	2	0	10	0	28
15	60	1	25	7	30
50	75	2.3	40	23	55
150	255	3.9	65	30	80
300	205	13.3	90	78	125
500	362	5.8	115	130	208

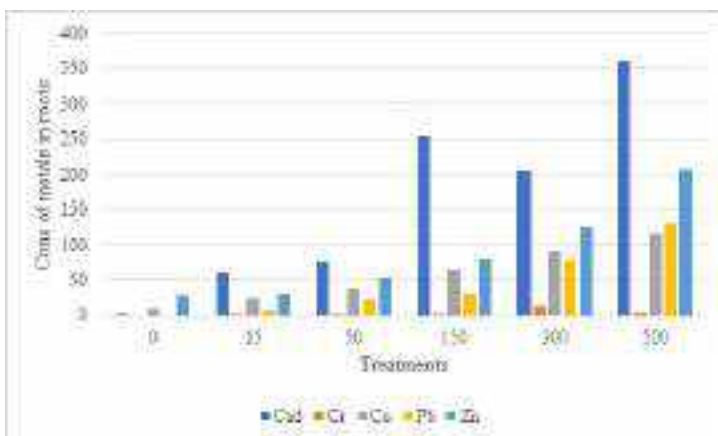


FIGURE 4: Concentration of heavy metals in roots of *Ipomoea carnea* after 9 weeks of treatment.

4. CONCLUSION

For almost two decades phytoremediation has been used which has now evolved as a cost-effective alternative to conventional methods to remediate contaminated soils. Green plants are used to remediate and reclaim soils and water contaminated by a wide range of pollutants including heavy metals (Salt et al., 1998; Meagher, 2003). Almost the first step in a phytoremediation study is to screen and select the plant with features like fast growth, high biomass, high bioaccumulation, non-invasive and easily adaptable. In conclusion, it may be said that plants in contact with metal contaminated soils, absorb and retain the metals for a short period (of about 6 weeks) as at this stage a maximum amount of absorption and accumulation of heavy metals takes place. Indefinite and continued absorption of the metal is not possible as is seen by the above experiments. There is a tendency in plants to lose metals to the soils at longer durations.

In general, if put in a nutshell, the behaviour of *Ipomoea carnea* concerning the five heavy metals tested is somewhat like this.

- Accumulation in roots in 6 weeks – Cd > Zn > Pb > Cu > Cr
- Accumulation in leaves in 6 weeks:
- At lower concentrations is Zn > Pb > Cu > Cd > Cr
- At higher concentrations is Pb > Zn > Cu > Cd > Cr

Metal content of the roots, after a further treatment of 3 weeks after the above observation is:

Cd > Zn > Cu > Pb > Cr

(Increase in the metal content of the root after 3 weeks after the observation)

Loss from the leaves over 3 weeks after the above observation

- a) At lower concentrations – the metal content is Zn > Pb > Cu > Cd > Cr
- b) At higher concentrations – the metal content is Pb > Zn > Cu > Cd > Cr

Therefore potential of *Ipomoea carnea* to effectively absorb the metals in Zn > Cd; Pb > Cu > Cr and retain them is Cd > Zn; Pb > Cu > Cr

The findings have relevance to the situation where plants are expected to detoxify toxic metals from solid waste dumps. The growth of plants for limited durations may help in improving the quality of soil by effectively removing the metals. The continued growth of plants, leads to a stage of equilibrium between metal concentrations in and out of plant organs.

BIBLIOGRAPHY

1. Arunakumara K. K. I. U., Walpola B. C. and M.-H. Yoon, (2013). "Current status of heavy metal contamination in Asia's rice lands," *Reviews in Environmental Science and Bio/Technology*, vol. 12, no. 4, pp. 355–377.

2. Bitther O.P., Pilon-Smits E.A.H., Meagher R.B., and Doty S. (2012). Biotechnological approaches for phytoremediation. In Plant Biotechnology and Agriculture; Arie Altman, A., Hasegawa, P.M., Eds.; Academic Press: Oxford, UK; pp. 309–328.
3. Black H. (1995). Absorbing possibilities: Phytoremediation. – Environ. Health Perspect. 103(12); 1106–1108.
4. Borišev M., Pajević S., Nikolić N., Krstić, B., Župunski M., Kebert M., Pilipovic A. and Sasa O. (2012). Response of *Salix alba* L. to heavy metals and diesel fuel contamination. Afr J Biotechnol. 11. 14313–14319. 10.5897/AJB12.1004.
5. Chaney R.L., Malik M. and Li Y.M. et al. (1997). “Phytoremediation of water metals,” Current Opinion in Biotechnology, vol. 8, no. 3, pp. 279–284.
6. Chaudhry T.M., Hayes W.J., Khan A.G. and Khoo C.S. (1998): Phytoremediation - focusing on accumulator plants that remediate metal contaminated waters. – Australasian Journal of Ecotoxicology. 4; 37–51.
7. Cunningham S.D., and Berti, W.R. (1993). Remediation of contaminated waters with green plants: an overview. In Vitro Cell Dev. Biol., 1993, 29, 207–212.
8. Elliott M. (2003). Biological pollutants and biological pollution—an increasing cause for concern. Marine Pollution Bulletin; 46:275–280.
9. El-Shahawi M.S., Hamza A., Bashammakhb A.S. and Al-Saggaf W.T. (2010). An overview on the accumulation, distribution, transformations, toxicity and analytical methods for the monitoring of persistent organic pollutants. Talanta; 80:1587–1597.
10. Kramer, U., 2010. Metal hyperaccumulation in plants. Annu. Rev. Plant Biol., 61: 517–534
11. Levenson R. (2001). More modern chemical techniques, The Royal Society of Chemistry.
12. Marques A. P. G. C., Rangel A. O. S. S., and Castro P. M. L. (2009). “Remediation of heavy metal contaminated waters: phytoremediation as a potentially promising clean-up technology,” Critical Reviews in Environmental Science and Technology, vol. 39, no. 8, pp. 622–654.
13. Meagher R.B. (2003) Phytoremediation of Toxic Mercury and Arsenic Pollution. In: Vasil I.K. (eds) Plant Biotechnology 2002 and Beyond. Springer, Dordrecht. https://doi.org/10.1007/978-94-017-2679-5_99
14. Meers E., van Slycken S., Adriaensen K., Ruttens A., Vangronsveld J., Du Laing G., Witters N., Thewys T. and Tack F.M. (2010). The use of bio-energy crops (*Zea mays*) for “phytoattenuation” of heavy metals on moderately contaminated waters: A field experiment. Chemosphere, 78, 35–41.
15. Murakami M., N. Ae and Ishikawa S. (2007). Phytoextraction of cadmium by rice (*Oryza sativa* L.), soybean (*Glycine max* (L.) Merr.) and maize (*Zea mays* L.). Environ. Pollut. 145: 96–103
16. Neumann P.M., D’Souza M.P., Pickering I.J. and Terry N. (2003). Rapid micro algal metabolism of selenate to volatile dimethylselenide. Plant Cell Environ 26:897–905

17. Nriagu J.O. and Pacyna J. (1988). Quantitative Assessment of Worldwide Contamination of Air, Water and Water by Trace Metals, *Nature*, 333: 134 – 139
18. Prasad K.V.S.K., Pardha Saradhi P. and Sharmila P. (1999). Concerted action of antioxidant enzyme and curtailed growth under zinc toxicity in *Brassica juncea*. *Environ Exp Bot* 42:1–10.
19. Raskin I., Smith R.D. and Salt D.E. (1997). Phytoremediation of metals: using plants to remove pollutants from the environment. *Curr. Opin. Biotechnol.* 8, 221-226.
20. Salt D.E., Prince R.C., Pickering I.J. and Raskin I. (1995). Mechanisms of cadmium mobility and accumulation in Indian mustard. *Plant Physiol* 1995; 109:1427–143
21. Salt D.E., Smith R.D. and Raskin I. (1998) Phytoremediation. *Annu Rev Plant Physiol Plant Mol Biol* 49:643-668
22. Tollsten L and Muller P (1996) Volatile organic compounds emitted from beech leaves. *Phyto-chem* 43:759-762
23. Wong M.H. (2012). *Environmental Contamination: Health Risks and Ecological Restoration*. United States of America: Taylor & Francis Group
24. Wuana R.A. and Okieimen F.E. (2011). Heavy metals in contaminated waters: A review of sources, chemistry, risks and best available strategies for remediation. *ISRN Ecol.* 2011, Article 20.
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Edited By

Dr. Abdul Matin
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Classroom Learning Before Covid-19 and Learning Through the Hybrid Education During the Pandemic

Shahida Shaikh*

The Shutdown of Educational Institutes

The COVID-19 pandemic promptly affected education, compelling the government to make a critical change to learning and all economic frameworks. This prompted reactions by advanced education establishments and strategy producers to guarantee the coherence of realization which prompted an emotional change in the experience of the educators and students.

In India, the COVID-19 flare-up was declared as a 'crisis by the pandemic' in the entirety of its states and associated domains. To battle COVID-19, lockdown was forced on March 25, 2020 which has antagonistically influenced the educational and economical framework in the country.



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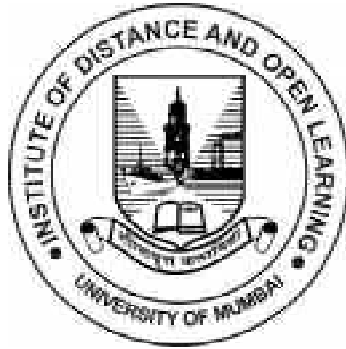
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Balaji Kendre

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Tribute to Bharat Ratna late Shri. Rajiv Gandhi former Prime Minister of India on the occasion of his 32nd death anniversary. He is remembered for his sacrifice and he is in the hearts and minds of Indians because of his immense contribution to the India and world in different fields.

We wish to inform you all that the Rajiv Gandhi Centre for Contemporary Studies (RGCCS) of University of Mumbai had organized National Seminar on 7th and 8th February 2022 on the theme Globalisation, Governance and Democracy: Progressive Communications and Challenges.

The theme was one of the mandates of the RGCCS. We thank Prof. Devanand Shinde former Hon. Vice Chancellor of University of Mumbai and Prof. Shuahs Pednekar Hon. Vice Chancellor University of Mumbai for their support and encouragement in this regard. Thanks to Prof.

Rajesh Kharat Dean Humanities for his support.

Myself then Director of RGCCS and Dr. Mariyah Gour-Ghori, Associate Professor in Sociology edited the book on same theme is published now by the University of Mumbai. We thank key note Speaker Prof. Madhav Govind, Professor and Chairperson Centre for Studies in Science Policy, Jawaharlal Nehru University, New Delhi for his excellent key note on the theme and all contributors such as Dr. Rohidas Munde, Dr. Sampat Kale, Dr. M. Tamilsaran, Mr. Samuel



Mariyah Gour Ghorri

Surrogate Motherhood in contemporary India

A study of Mumbai City

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