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# Advance and Innovative Research

(Conference Special)
(Part – 2)

Indian Academicians and Researchers Association
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MULTIDISCIPLINARY

# INTERNATIONAL CONFERENCE

ON

## CHANGING PERSPECTIVES IN MANAGEMENT, HUMANITIES, SCIENCE & TECHNOLOGY

ORGANIZED BY

## DRT's A. E. KALSEKAR DEGREE COLLEGE

MUMBRA, THANE

23rd March, 2019

Publication Partner

Indian Academicians and Researcher's Association

## ABOUT THE TRUST

Daar-ul-Rehmat Trust is a registered charitable trust established in 1986 with the initial object of providing education to poor students at moderate expenses & rehabilitation of orphan girls. The Trust is serving the needs of the society through the Schools, Junior colleges & a Degree College managed by it. It also manages an orphanage of girls who are encouraged to complete their education.

## ABOUT THE COLLEGE

**Mission:**

"Achieving academic excellence by providing self-development opportunities, inculcating right moral and social values and developing responsible citizenship."

DRT's A. E. Kalsekar Degree College was the first degree college to be set up in the Kausa-Mumbra area in the year 2001 with the faculty of Arts and Commerce. The faculty of Science was introduced in 2004-05 and later on commenced self-finance courses of BBI ,BMS & BSc IT. The college is permanently affiliated to University of Mumbai. The college introduced additional division in faculty of Commerce, BMS and BSc –IT to meet the growing demand of the courses. The college has beautiful campus with spacious building and state of the art infrastructure. Currently 1800 plus students are pursuing their degree from the college. The college has earned the reputation in the field of quality education and has to its credit, university rank holders and good results at University exams.

College offers a healthy blend of academics , sports, cultural and extention programmes. Newly setup Skill Development Centre of the college conducts add-on courses ,short term and value added courses to enhance the soft skills and employability among the students.

The institution strives to promote research culture among its staff and students. Well equipped laboratories, cyber zone and Library stocked with large collection of books, journals and soul software helps the staff and students to enrich their knowledge. The college makes continuous efforts to provide necessary assistance for holistic development and progression of the students. The college is recently accredited by NAAC with B++ grade and has ISO Certification 9001:2015 . The college aspires to emerge as a Centre of higher education, learning and innovative research to meet challenge of global society.

## ABOUT THE CONFERENCE

India has emerged as the fastest growing major economy in the world. In the global context, countries across world including India are moving towards diversified fields of management and humanities. There is a great challenge for the promotion of innovative ideas and creative thinking in globalised dynamic and competitive markets. The impact of development on science and technology in our daily life and living standard of the society cannot be neglected. There is a strong focus on science and technology to sustain the available resources for accelerating the pace of growth and development in the new era. From diffusion of IT, growth of knowledge economy, Inclusive growth, sustainable development to globalization ,market oriented opportunities and managerial innovations, the factors driving and being driven by socio, political, economic ,and cultural changes are both wide ranging and deep.

The current global scenario has compelled to focus on changing perspectives in Management, Humanities, Science and Technology. Realizing the need, DRT's A.E Kalsekar Degree College is organizing one day Multidisciplinary International Conference on "Changing Perspectives in Management, Humanities, Science& Technology". The conference will provide a platform for sharing ideas, opinion and information on the above mention areas. It will aim to assess the trends, challenges and polices that are likely to shape the foundations of future generation.

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Principal
DRT's A. E. Kalsekar Degree College
Mumbra, Thane

**Mrs. Arjumand. Z. Rawal**
IQAC Co-ordinator, DRT'S A. E. Kalsekar Degree College
Mumbra, Thane

# Chairman's Message

It is a matter of great pride that IQAC of our college has organized one day Multidisciplinary International Conference on *"**Changing Perspectives in Management, Humanities, Science & Technology**"on* Saturday, **23rd March 2019.**

DRT's A.E.Kalsekar Degree College was the first degree college to be set up in the Kausa-Mumbra area in the year 2001. The institution offers Regular courses in Arts, Commerce & Science and Professional Courses in BBI ,BMS & BSc IT. The institution also strives to promote research culture among its staff and students. The college makes continuous efforts to provide necessary assistance for holistic development and progression of the students. The college aspires to emerge as a Centre of higher education, learning and innovative research to meet challenge of global society.

International Conferences provide a platform to the researcher for exchanging and sharing their experiences, research results, new ideas on emerging topics related to the main theme. We look forward to an exciting day with insightful presentations, discussions, and sharing of technical ideas with participants from different areas. The interaction during the conference will definitely open new arena of learning and also help in enhancing quality education. I am happy and wish success to the Principal and staff of the college for their efforts in organizing this International Conference.

**Mr. Abdus Salam Rawal**
Chairman
Daar –Ul-Rehmat Trust

# Principal's Message

It is rightly said that "A dream becomes a goal when action is taken towards its achievement" and we are committed in taking constructive and purposeful actions to produce optimistic, independent, compassionate, life-long learners and leaders who will bring glory not only to the Institution but also to the nation at large.

Keeping in mind the mission of our College we are continuously working towards student involvement and participation to make education purposeful. The college organizes a number of events, curricular & extra curricular to provide opportunities to students for exhibiting and enhancing their skills & academic prowess.

Our College is certified with ISO 9001: 2015 a latest version of ISO, to provide value added and quality education to our students and has been included under Section 2(f) & 12 (B) of the UGC Act, 1956.

Our College provides platform for every student to develop his or her own talent to achieve their goals in academics, research, sports, drama, NSS and DLLE.

Extracurricular activities are the forte of our College and continuously trying to develop the confidence among students.

The college is committed to fulfilling its social responsibility by engaging in social outreach programmes. Many socially oriented projects are arranged to sensitize students and mould them into good human beings and confident leaders.

The college promotes research culture through organizing Multidisciplinary Conference every year initiated by the Internal Quality Assurance Cell of the College. It takes effort to get research papers published in reputed journals. Encouragement is provided to faculty and students to undertake research initiatives and projects.

The above development of the College is not possible without support of Management of Daar-ul-Rehmat Trust, who are generous and keen for the betterment of Institution.

I acknowledge the sincere efforts of all the faculty members, the non-teaching staff and support from the stake holders towards the progress of the institution.

I express our heartfelt gratitude to the publisher for his guidance and support in compiling the research papers for publication.

**Dr. Shaikh Nisar Ahmad**
Principal

# International Journal of Advance and Innovative Research

**Volume 6, Issue 1 (XXXV): January - March 2019 Part - 2**



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# CONTENTS

## *Research Papers*

**International Journal of Advance and Innovative Research**
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# AEROMYCOFLORA AND *ASPERGILLUS* SPP IN THE ATMOSPHERE OF KATHMADU IN DIFFERENT SEASONS

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## ABSTRACT
*Atmospheric air is an important source of bioaerosols that play key role in human health. It includes wide varieties of fungal spores, bacteria, viruses and different particles of biological origin. Fungal spores and hyphal fragments are the major constituents of bioaersol including diverse groups of Mycoflora. Aspergillus spp. is the predominantly distributed fungal genus in the atmospherere its impact on human health and severity is dependent on seasons. The survey was carried by exposing Gravity Slide and Gravity Plate method. The isolated fungi were identified by observing colony morphology and microscopic methods. The occurrence of various fungi was counted in different seasons. More than 113 different spore types belonging to 67 genera were indentified from Kathmandu. The number and types of fungal spores were highest during autumn counts (32.27%) followed by summer (31.57%) in Gravity slide method and the highest numbers of spores belonging to Aspergilli/ Penicilli group accounting about 81.20 % was recorded. Summer spora was recorded highest of 31.42%, followed by autumn (26.36%) in Gravity plate method. The fungal spores are the predominant contaminants of air, distributed uniformly during all seasons and areas. They are capable to grow in sufficiently dry to warm high humid conditions and cause a wide range of allergenic reaction to human beings and will increase with their increasing concentration of spores in air.*

*Keywords: Bioaerosols, Mycoflora, Allergenic, Fungal spores, Aspergilli/Penicilli, Aspergillus*

## INTRODUCTION
Kathmandu Valley was one of the most a beautiful cultural city, that recorded in world heritage, which has now transformed itself into city of pollution. The city is now clad in dust and smoke (Saud and Pandey 2018). The pristine blue hills and the crisp blue sky that covered the valley just about two decades ago now appear gray and hazy due to the stagnant smog that hovers over them (http://www.kathmandu.gov.np/en). The Valley has a unique bowl-shaped topographic structure, thus it restricts the movement of wind thereby retaining the pollutants in the air and is vulnerable to air pollution (Parajuly 2016). The pollutants; dust contains a large number of biological particles including fungal spores.

There are more than 50,000 valid species of fungi and only approximately 25 species cause the majority of human diseases. The concentrations of fungal spores in the outdoor air may vary depending on the weather and the climate. The most common characteristics of an airborne fungal population is related to different environmental factors, such as seasonality, location, meteorological parameters, relative humidity, and temperature (Sivasakthivel and Nandini, 2015; Lang-Yona et al., 2012). Exposure to fungal spores occurs mostly indoor nevertheless; outdoor air is an important source of both aeroallergens and pathogens (O'Gorman, 2008). Air movements readily transport particulate matter over considerable distances, e.g. spread of foot and mouth disease virus, pollen deposits at the earth's poles and transportation of spores of stem rust disease from Mississippi valley (where it is epidemic) to the northern regions of Canada (Cox, 1995). Such ubiquitous fine biological particles of diameter 0.05-100 µm (Pelczar et al., 2004) are termed "bioaerosols". However, the abilities of air-born microbes to cause disease also depend in their surviving and remaining infective for susceptible hosts (Cox, 1995).

Occurrence of fungal spores in the air is markedly seasonal because of their sensitivity to weather changes (Ste˛palska et al., 2005). The content of fungal spores of every taxon in air is characterized by a specific seasonal and diurnal cycle (Kasprzyk et al., 2004). Airborne fungal spores occur throughout year, but the seasonal rhythm in the occurrence of airborne spores and their spectrum depends on the type of climate (Kasprzyk, 2008). Weather conditions affect the sporulation, dispersal and deposition of spores and their elements correlate with each other (Kasprzyk, 2008).

In Kathmandu, the highest number of fungal spores was reported in the spring season followed by decrease up to autumn season and increasing tendency afterwards (Shrestha & Sharma 1994). Air spora is usually reported that spores of *Aspergillus* and *Penicillium* were present in the Derby air throughout the year ( Millington & Corden 2005)**.** Fungal spores were reported throughout the seasons, in both the summer and winter seasons and the species of *Alternaria* (12.5%), *Aspergillus* (12.5%), *Curvularia* (7.5%), *Cladosporium, Helminthosporium, Mucor,* etc. (Devkota & Sharma, 1990) , however, higher fungal counts were reported in summer season.

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Fungal exposure to human beings causes acute toxic effects, allergies, and asthma (Burge, 2002). The major allergic manifestations include asthma, rhinitis, bronchopulmonary mycoses and hypersensitive pneumonitis. The most frequent clinical symptoms are sneezing, nasal discharge, shortness of breath, urticaria angiedema and anaphylaxis (Oliveira et al., 2003). There is increasing evidence that fungal growth in indoors is a risk factor for the development of childhood asthma and allergies. Eggimann et al., (2006) reported that the digestive tract may represent a portal of entry for *Aspergillus* species in immunocompromised patients. Molds of the genus *Aspergillus* produce many of infections, nearly half in some instances, and *Aspergillus fumigatus* is by far the most prominent species especially in leukemia (incidence, 5 to 25%) and in patients transplanted with solid organs, where the incidence is 1 to 10% (Denikus, 2005).

The survey of aeromycoflora of Kathmandu would provide very important data for regarding the distribution of fungal spores during different seasons in Kathmandu. The study will also provide the data of prevalence of *Aspergillus* spp. in the atmosphere.

## MATERIAL AND METHODS

Kathmandu is the capital of Nepal and situated at $27^{o}$ 42' N altitude and $85^{o}$ 20' longitude in an altitude of about 1300m above the sea level. The area of Kathmandu is extended about 351 sq. Km and is surrounded by green mountains [Phulchowki hill (3122 m) in southeast, Shivapuri (2713 m) in north, Champa Devi (2400m) in southwest and Nagarjun (2100m) in west] forming almost a flat basin like valley.

The climate of Kathmandu valley is warm, temperate with summer monsoon starting from mid June to late September. The dry season extends from about mid-October until pre-monsoon showers begin in late April and mid- May. The meteorological analysis of Kathmandu valley has been carried out during the study period (2010-2011). The average annual precipitation is about 1295mm. The maximum temperature (27- $29^{o}$C) of the Kathmandu valley was reported during late spring to early summer (April –September) and the minimum temperature reported was 20-20.3$^{o}$C. The temperature lowered from October and fall down rapidly to an average maximum of 20.2$^{o}$C during January and the minimum temperature of 2.2$^{o}$C. The humidity is comparatively higher from July to September with 80.2% to 90%. The lowest relative humidity (56.9 %) was recorded in March and (57.1%) in April. In rest of the months, the mean humidity ranged from 75-90%. The annual average humidity was 69.93-82.6%.

A sampling device (aeroscope) was used for collecting airborne mycoflora. The device was setup in different areas during various season of the year 2010/2011.

**Gravity slide** sampling was done by using a glass slide (75mm x 25mm) with the double adhesive tape was fixed in the slide and Durham type of air-sampler. A total of 576 and 72 slides were exposed in the atmosphere of Kathmandu. Slides were exposed for three times in a day from 6-10 A.M., 2-4 P.M. and 8 P.M. to 10 P.M. separately during the months, February / March / April (spring), May / June/ July (summer), August / September / October (autumn) and November/ December/ January (winter). The exposed, slides were removed from the sampler and returned to the laboratory for further study. Then a drop of lacto-phenol and cotton blue was placed separately at the exposed area. The spores impacted on the glass slides were counted. The number of spores per $cm^2$ was calculated and reported the population of fungi in seasons and diurnal variations were recorded.

Gravity Plate sampling was done as method described by Colakoglu, (1996), Hedayati et al., (2005), Basilico et al., (2007) was exposed horizontally just below the "Gravity Slide Sampler". The plate was exposed for 10 minutes to avoid the over load of spores on the surface of medium (Frankland, 1989). The exposed plates were returned to the laboratory and incubated in inverted position at $28\pm1^{0}$C for 10-14 days for the development of colony from the spores collected. The number of fungal colonies developed was counted every day. A control plate (unexposed) was maintained at each site and in each sampling time. From the colony counts, CFU/$cm^2$ was calculated and the population densities of fungi in different seasons were reported.

The isolate fungi were identified by observing colony Morphology, Microscopic Study and identification was done by using references [Barnett & Hunter, (1972), Barron, (1977), Ellis, (1977 and 1985), Gilman, (1957), Rapper & Fennel (1965), Rapper & Fennel (1965)].

## RESULTS

Distribution of fungi in different seasons by using Gravity Slide Sampler method was recorded the highest number of spores during in autumn (32.27%) followed by summer (31.57%) and winter (9.75%). Out of total spores Aspergilli/ Penicilli group was recorded about 81.20% with the seasonal variation of autumn (34.53%), followed by summer (31.13%) in number and a few number during winter season. Cladosporium was reported the second highest with its prevalence (8.72%) of the total (Table 1).

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**Table-1: Total number of fungal spores collected in different seasons by using Gravity Slide sampler method from Kathmandu**

| S. no. | Fungal types | Autumn | Winter | Spring | Summer | Total | % |
|---|---|---|---|---|---|---|---|
| I | Zygomycetes (*Mucor and Rhizopus*) | 43 | 20 | 36 | 37 | 136 | 1.46 |
| II | Ascomycetes | 22 | 10 | 31 | 44 | 107 | 0.90 |
| III | Basidiomycetes (Rust and Smuts) | 38 | 41 | 54 | 47 | 180 | 1.53 |
| IV | Deuteromycetes | | | | | | |
| 1 | *Alternaria* spp | 58 | 51 | 76 | 101 | 286 | 2.41 |
| 2 | Aspergilli/Penicilli | 3331 | 895 | 2416 | 3002 | 9644 | 81.20 |
| 3 | *Bispora* spp | 1 | 2 | 2 | 3 | 08 | 0.06 |
| 4 | *Botrytis* spp | 11 | 0 | 10 | 7 | 28 | 0.23 |
| 5 | *Chaetomium* spp | 2 | 0 | 0 | 3 | 05 | 0.04 |
| 6 | *Cladosporium* spp | 201 | 112 | 407 | 316 | 1036 | 8.72 |
| 7 | *Curvularia* spp | 52 | 8 | 59 | 73 | 192 | 1.62 |
| 8 | *Drechslera* spp | 13 | 3 | 11 | 19 | 45 | 0.38 |
| 9 | *Epicoccum* spp | 6 | 1 | 3 | 8 | 18 | 0.15 |
| 10 | *Fusarium* spp | 16 | 5 | 11 | 23 | 55 | 0.46 |
| 11 | *Fusariella* spp | 3 | 0 | 0 | 2 | 05 | 0.04 |
| 12 | *Fusiform* spp | 3 | 0 | 3 | 2 | 08 | 0.06 |
| 13 | *Helmithosporium* spp | 3 | 0 | 2 | 5 | 10 | 0.08 |
| 14 | *Humicola* spp | 3 | 0 | 0 | 3 | 06 | 0.05 |
| 15 | *Leptosphaeria* | 2 | 0 | 0 | 4 | 06 | 0.05 |
| 16 | *Periconia* spp | 1 | 0 | 1 | 2 | 04 | 0.03 |
| 17 | *Stemphyllium* spp | 1 | 1 | 0 | 0 | 02 | 0.03 |
| 18 | *Torula* spp | 2 | 0 | 4 | 5 | 11 | 0.09 |
| 19 | *Trichothecium* spp | 5 | 0 | 0 | 6 | 11 | 0.09 |
| 20 | Unclassified | 16 | 9 | 11 | 37 | 73 | 0.61 |
| Total | | 3833 | 1158 | 3137 | 3749 | 11876 | 100 |
| Percentage | | 32.27% | 9.75% | 26.41% | 31.57% | | |

Distribution of fungi in different seasons by using Gravity Plate sampler method was presented in the table 2. There is no significant difference among the distributions of log population density of all four seasons (p-value, 0.208 is greater than alpha, 0.05). The distribution patterns of the log population density of the fungi remain the same in all seasons. Tamhane Multiple Comparisons also revealed that there is the same distribution pattern of log population density of the fungi for all seasons; autumn, winter, spring and summer (Table-23). However, summer season showed the highest log population density (3.7472) of the fungi among all other seasons, which is the favourable season for fungal distribution. It is followed by three season autumn (3.7187), spring (3.6587) and winter (3.6499). Box-plots showed that the distributions of fungi in all the seasons are approximately normal (Figure1). The individual fungal genus Aspergillus spp. was the most frequently isolated fungus among all genera in all seasons with highest count of 14.82%.

**Table-2: The number of different fungi in the various seasons from the atmosphere of Kathmandu by using Gravity Plate sampler method**

| S. No. | Different isolates | Autumn | Winter | Spring | Summer | Total | Percent |
|---|---|---|---|---|---|---|---|
| 1 | *Acremonium* spp | 6 | 14 | 5 | 3 | 28 | 0.81 |
| 2 | *Acrephialophora* spp | 2 | 0 | 0 | 2 | 4 | 0.12 |
| 3 | *Alternaria* spp | 82 | 95 | 98 | 68 | 343 | 9.97 |
| 4 | *Ampulliferina* spp | 3 | 0 | 2 | 4 | 9 | 0.26 |
| 5 | *Aspergillus* spp | 134 | 68 | 123 | 185 | 510 | 14.82 |
| 6 | *Aureobasidium* spp | 15 | 12 | 0 | 6 | 33 | 0.96 |
| 7 | *Botrytis cinerea* | 13 | 0 | 18 | 11 | 42 | 1.22 |
| 8 | *Candida* spp | 15 | 4 | 20 | 24 | 63 | 1.83 |
| 9 | *Ceratocystis* spp | 0 | 0 | 7 | 4 | 11 | 0.32 |
| 10 | *Chaetomium* spp | 5 | 0 | 6 | 15 | 26 | 0.75 |
| 11 | *Chalara* spp | 5 | 2 | 11 | 10 | 28 | 0.81 |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 12 | *Chalaropsis* spp | 0 | 0 | 4 | 3 | 7 | 0.20 |
| 13 | *Choanephora* spp | 8 | 0 | 0 | 3 | 11 | 0.32 |
| 14 | *Circinella* spp | 0 | 0 | 12 | 16 | 28 | 0.81 |
| 15 | *Cladosporium* spp | 67 | 52 | 96 | 59 | 274 | 7.96 |
| 16 | *Chloridium* spp | 3 | 0 | 0 | 2 | 5 | 0.14 |
| 17 | *Cunninghamella* spp | 5 | 5 | 0 | 4 | 14 | 0.40 |
| 18 | *Curvularia* spp | 24 | 8 | 32 | 38 | 102 | 2.96 |
| 19 | *Cylidrocladium* spp | 4 | 0 | 2 | 4 | 10 | 0.29 |
| 20 | *Drechslera* spp | 24 | 0 | 28 | 31 | 83 | 2.41 |
| 21 | *Emericella nidulans* | 10 | 0 | 9 | 21 | 40 | 1.16 |
| 22 | *Epicoccum* spp | 28 | 26 | 21 | 8 | 83 | 2.41 |
| 23 | *Fusarium* spp | 41 | 18 | 53 | 69 | 181 | 5.26 |
| 24 | *Fusicladium* spp | 0 | 0 | 2 | 1 | 3 | 0.09 |
| 26 | *Geotrichum candidum* | 6 | 0 | 3 | 8 | 17 | 0.49 |
| 27 | *Humicola* spp | 13 | 3 | 10 | 15 | 41 | 1.19 |
| 28 | *Leptodiscus* spp | 0 | 3 | 1 | 0 | 4 | 0.12 |
| 29 | *Mortiella* spp | 0 | 3 | 0 | 3 | 6 | 0.17 |
| 30 | *Memnoniella echinata* | 0 | 0 | 1 | 2 | 3 | 0.09 |
| 31 | *Monocillium* spp | 2 | 0 | 3 | 2 | 7 | 0.20 |
| 32 | *Mucor* spp | 23 | 16 | 22 | 15 | 76 | 2.21 |
| 33 | *Nigrospora* spp | 16 | 8 | 19 | 2 | 45 | 1.31 |
| 34 | *Paecilomyces* spp | 15 | 0 | 11 | 20 | 46 | 1.34 |
| 35 | *Penicillium* spp | 138 | 95 | 110 | 130 | 473 | 13.75 |
| 36 | *Pestalotia* spp | 11 | 0 | 9 | 14 | 34 | 0.98 |
| 37 | *Pithomyces* spp | 3 | 0 | 7 | 4 | 14 | 0.40 |
| 38 | *Phialophora verrucosa* | 0 | 0 | 3 | 2 | 5 | 0.14 |
| 39 | *Phoma* spp | 3 | 0 | 6 | 8 | 17 | 0.49 |
| | | | | | | | |
| 40 | *Phomopsis* spp | 0 | 4 | 3 | 7 | 14 | 0.40 |
| 41 | *Pseudocercospora* spp | 0 | 0 | 0 | 6 | 6 | 0.17 |
| 42 | *Rhizopus* spp | 30 | 26 | 21 | 37 | 114 | 3.31 |
| 43 | *Scolecobasidium variabile* | 6 | 3 | 6 | 5 | 20 | 0.58 |
| 44 | *Scopulariopsis bravicaulis* | 15 | 2 | 4 | 18 | 39 | 1.13 |
| 45 | *Scytalidium* spp | 0 | 0 | 3 | 4 | 7 | 0.20 |
| 46 | *Sepedonium* spp | 4 | 5 | 8 | 2 | 19 | 0.55 |
| 47 | *Stemphyllium* spp | 0 | 0 | 0 | 2 | 2 | 0.06 |
| 48 | *Stachybotrys atra* | 2 | 0 | 6 | 8 | 16 | 0.46 |
| 49 | *Syncephalastrum racemosum* | 0 | 0 | 5 | 8 | 13 | 0.37 |
| 50 | *Telaromyces* spp | 2 | 0 | 3 | 3 | 8 | 0.23 |
| 51 | *Thielavia tericola* | 3 | 2 | 4 | 4 | 13 | 0.37 |
| 52 | *Thilaviopsis* spp | 0 | 2 | 2 | 0 | 4 | 0.12 |
| 53 | *Torula* spp | 10 | 4 | 12 | 15 | 41 | 1.19 |
| 54 | *Trichoderma* spp | 17 | 0 | 3 | 41 | 61 | 1.77 |
| 55 | *Trichothecium* spp | 4 | 0 | 5 | 3 | 12 | 0.35 |
| 56 | *Tritirachium* spp | 6 | 0 | 2 | 3 | 11 | 0.32 |
| 57 | *Ulocladium* spp | 0 | 9 | 11 | 3 | 23 | 0.67 |
| 58 | *Verticillium* spp | 2 | 0 | 0 | 3 | 5 | 0.14 |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 59 | Mycelia sterila | 38 | 35 | 29 | 38 | 140 | 4.07 |
| 60 | Unidentified | 40 | 26 | 21 | 52 | 139 | 5.04 |
| | Total | 907 | 550 | 902 | 1081 | 3440 | |
| | Percentage | 26.36% | 15.98% | 26.22% | 31.42% | | |

**Table-3: Dependent Variable: Log population density (Post Hoc Text for Multiple Comparisons)**

| | (I) Season | (J) Season | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Tamhane | Autumn | Winter | .0688 | .05617 | .776 | -.0792 | .2168 |
| | | Spring | .0600 | .05316 | .835 | -.0800 | .2000 |
| | | Summer | -.0285 | .05121 | .994 | -.1634 | .1063 |
| | Winter | Autumn | -.0688 | .05617 | .776 | -.2168 | .0792 |
| | | Spring | -.0089 | .05668 | 1.000 | -.1582 | .1405 |
| | | Summer | -.0974 | .05486 | .378 | -.2419 | .0472 |
| | Spring | Autumn | -.0600 | .05316 | .835 | -.2000 | .0800 |
| | | Winter | .0089 | .05668 | 1.000 | -.1405 | .1582 |
| | | Summer | -.0885 | .05177 | .423 | -.2249 | .0478 |
| | Summer | Autumn | .0285 | .05121 | .994 | -.1063 | .1634 |
| | | Winter | .0974 | .05486 | .378 | -.0472 | .2419 |
| | | Spring | .0885 | .05177 | .423 | -.0478 | .2249 |

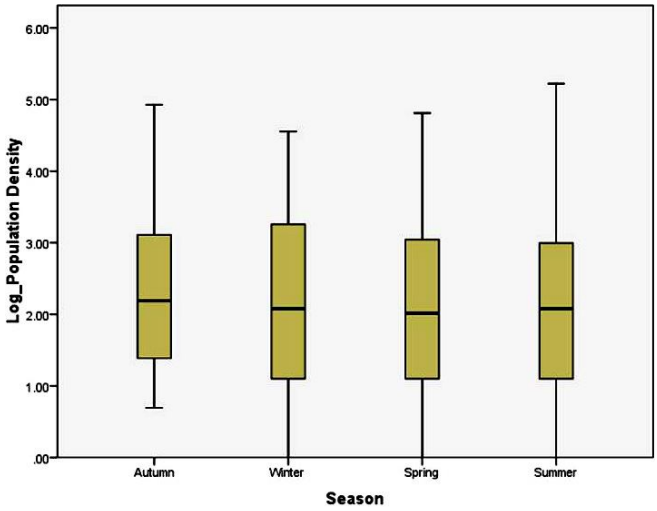


Figure-1: Box plots: Season wise distribution of the log population density of the fungi.

**DISCUSSION**

Total 11,876 fungal spores belonging to different classes were captured by Gravity Slide method. Among all classes of fungi, Deuteromycetes only include the maximum percentage (96.12%) followed by Basidiomycetes (Rust and Smuts) (1.52%) and Ascomycetes (0.90%). A total of 3448 colonies were isolated by Gravity Plate method giving an average of 7.98 CFU/cm$^2$. Total 67 genera of fungi were identified from Kathmandu, of which 46 genera (86 species) belong to Deuteromycetes, 7 Basidiomycetes spore types including *Puccinia* spp, 7 genera (8 species) to Ascomycetes and Zygomycetes including 6 genera (10 species) and 2 other types. Devkota & Sharma, (1989) isolated 40 species of fungi from the different locations of Kathmandu; Bingshan & Haijuan, (1990) isolated 98 species of 39 genera from China; Bot.346, (1997), Shrestha et al (2010) reported that *Aspergillus* spp was the most dominating genera (47.38%) followed by *Penicillum* (16.15%), from Bangladesh.The occurrence of Aspergilli/ Penicilli group with highest percent with 81.20 % followed by *Cladosporium* with 8.73%. However, by Gravity Plate Method *Aspergillus* spp were counted the highest 14.86% followed by *Alternaria* with 9.97% from Kathmandu. Upadhayay et al. (1988) isolated 36 fungi from human eyes of which *Aspergillus* as the most frequent spp. and they stated that these fungi were carried by air from different sources.

The population density of fungi was varied with seasonal variations. Summer season (mean rank, 3.45) was noted to have high population density. Omana Mathew et al., (2002) recorded highest concentration during

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autumn and the lowest concentration in the rainy season. Stepalska & Wołek, (2005) correlated the distribution of fungal spores with relative humidity (ranging 65%-79%), temperature (maximum 24.7°C) and the lowest monthly precipitation (53.4 mm).

*Aspergillus* spp. was found the most frequent dominant and prevalent among all isolates and in all seasons accounting 14.5% of the total air spora. However, the prevalence of *Aspergillus* spp from the air of Kathmandu was recorded in a range of 11.73% to 17.50%. It was not much different during spring and winter. The genus was recorded with highest species including more than 12 species which *Aspergillus flavus, A. fumigatus, A. niger* etc. were the most frequent species. The genus recorded with high value during summer season with 185, was followed by autumn (134). *Aspergillus* spores collected throughout the year and recovered the highest number during day time. Charkraborty et al., (2003) reported similar result. However, Upadhyaya et al., (1988) reported 47% and Devkota & Sharma, (1989) found 12.5% from Kathmandu; 1.63% from India (Mane, 2002); Awad, (2005) reported 11.2–38.9% of *Aspergillus* in Egypt and its incidence related to local microenvironments and urbanization. The highest spores (26.27%) of *Aspergillus* were recorded during autumn and the lowest (13.33 %) during winter by Gravity Slide Method. But the highest population was obtained during summer season by Gravity Plate Method. Environmental factors play a key role in the distribution of *Aspergillus* spp. This fungus is abundant in distribution during favorable season because of temperature, saprophytic nature, atmospheric humidity, rain-fall and wind velocity. But particularly during summer the atmosphere is warm and humid, which is suitable for the growth and dispersal of spores of *Aspergillus*. Awad, (2005) reported *Aspergillus* (11.2–38.9%) of the total spores and 38.9% of this genus common in the cultivated and urban areas and related to local microenvironments and urbanization.

The fungal spores of atmosphere gradually increase and reach its maximum in September to October with high atmospheric humidity. It was observed that the spore contents decreased after November till December, January and February. It might be due to down fall of temperature in winter season. The spore contents were reported to increase with the increase in average mean of atmospheric temperature from March to May. Thereafter, the concentration decrease because of rain. But continuous rain water usually washes out the spores. However, the spore counts were found high after long rain. The rain water enhances sporulation. From the results it can be concluded that distribution of fungal spores varied greatly with seasons.

Moreover, fungal respiratory infections such as allergic broncho-pulmonary infection, Vasomoter rhinitis and Asthma, Common cold might be present in Kathmandu valley (Chokhani, 2008). Myszkowska et al. (2002) pointed out the seasonal occurrence of allergenic airborne spores, their concentrations and diurnal rhythm was particularly important in assessing the etiology of allergic diseases and the seasons overlap with the seasonal occurrence of allergenic pollen grains in air. Gravesen (1979); Burge et al. (1982) reported more than 80 species of fungi associated with symptoms or respiratory tract allergy. They reported that *Alternaria, Aspergillus* and *Penicillium* are equally important moulds whereas, *Phoma, Botrytis* and *Mucor* as the fungi of clinical relevance. Bronchial asthma is the most important inhalant mould allergy while rhinitis probably is in frequents. Johns et al. (1973) explained that airborne moulds that are non-pathogenic for human skin, but they are important as extrinsic inhalant allergy in patients with respiratory atopy (meaning a strange disease). The distribution of these organisms varies with temperature, humidity and air currents, but they are truly ubiquitous.

## CONCLUSION

It can be concluded that the atmosphere of Kathmandu is overwhelmed with the spores of different fungi. Summer season has the diverse population of fungi. *Aspergillus* spp is most common and widely distributed in the different areas and different seasons studied. Spores of *Aspergillus* spp mainly *A. fumigatus* cause allergenic agents. This study provides seasonal patterns of prevalence this fungus. There is an increased risk of aspergillosis in individual who have received high doses of corticosteroids and other immune suppressive regimen can be minimize with the knowledge of distribution patterns.

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# CHALLENGES FOR DISINVESTMENT OF AIR INDIA- A PUBLIC SECTOR ENTERPRISE

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## ABSTRACT
*Air India has been in the media reports as the government had offered 76% of stake sale process for privatisation. Air India was not successful in getting the bid from any company. The research paper mainly highlights the reasons for the failure. The financial implications on the sale through the financial statements has been considered for the study. The financial ratios like debt equity ratio, interest coverage, working capital, debt service coverage, solvency, current ratio, quick ratio, debt to total assets are considered for the study. The analysis highlights the reasons for the failure of the organisation and gives solutions for the firm to frame the strategies for sale to the private sector. The study also envisages the future course of action for the firm. The parameters like debt burden, losses, market share, net working capital, revenue, equity and fuel prices for the last ten years are highlighted in the study.*

*Keywords: Disinvestment, Air India, Revenue, Equity, Borrowings, Networking Capital, Cash, Fuel*

## INTRODUCTION
In 1932, J.R.D Tata founded first scheduled airline as Tata Airlines. Later in the year 1946, it became the public limited company under the name of Air India. Government of India has 49% stake in the company. In the year 1948, International operations were started by the company under the name Air India International. In 1994, Air India and Indian Airlines was converted into a Limited company under the Companies Act 1956. In 2007, Air India and Indian Airlines were merged into a single entity named as National Aviation Company of India Limited. Air India has 118 aircrafts out of which 77 planes are owned, 22 on sale and lease back and 19 on dry lease. It has more than 18 million annual passengers. The market share of Air India in 2013 was 19.4%, which was dropped to 13.3% in 2017.

## LITERATURE REVIEW
Ashish Srivastava (2014) concluded in the study that disinvestment is good for the economy of the country. It provides revenue for the government, increases operating and financial performance of the organisation and restructures those units that suffer losses continuously. The study also highlighted certain suggestions that the government should fix certain disinvestment strategies considering last year's targets and current GDP rate. The government should have a transparent policy so that public and private policies follow the fair process.

R Venkatesan and Pallavi Choudhuri (2017) have concluded in their research work that the financials of Air India are on the verge of profitability. Strategic disinvestment at this stage may not be the optimal solution. It is depicted that the debt obligations of the carrier can be serviced, given its improving performance. The airline's revenues also entail large amounts of foreign exchange inflows. With global crude oil prices estimated to remain restrained, strategic disinvestment of Air India at this point of time is not appropriate.

Mohd.Mohsin Khan and Swaricha Johri (2014) have emphasized in their research that the civil aviation sector is the primary mover for the economic growth and the strategic division of the employment generation. The financial crisis had an impact on all the sectors of industry. Aviation industry also had a huge impact due to the crisis. Adverse growth rate, massive debt burden, excessive operating cost etc. have become the essential features of the airlines functioning in India. The National carrier Air India is constantly recording losses. The Global financial crises have extended to India through the financial network, the definite channel and the confidence channel. The authors have attempted to know the impact of global financial crisis on the financial performance and growth of Air India Limited. For this purpose, the annual reports of Air India Limited from the period of year 2007-08 to 2013-14 has been analysed and the impact has been measured by making the use of Multiple Regression Analysis. EBIT has taken as the dependent variable and Aviation Turbine Fuel price, increasing payments to employees, passenger revenue and other expenses were treated as independent variable. The study addressed the major causes of the negative growth of the Air India Limited.

## OBJECTIVES OF THE STUDY:
1. To understand the financial reasons of failure of Air India.
2. To analyse the company based on the variables like fuel and revenue.
3. To analyse the company based on the variables like cash and revenue.

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4. To investigate the relationship between the net working capital and revenue.
5. To examine the influence of borrowings on the revenue.
6. To highlight the changes in equity and revenue.

## RESEARCH METHODOLOGY

The research paper considers the financial data for the last 10 years provided by the company. The statistical software SPSS is used for the analysis of the data. The study considers important variables and discovers the relationship with each variable with its effect on the revenue of the organisation.

The variables considered for the study are fuel, cash, net working capital, borrowings and equity.

## DATA ANALYSIS

**Regression:**

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .949[a] | .900 | .775 | 18863.166 | .900 | 7.213 | 5 | 4 | .039 |

a. Predictors: (Constant), fuel, Cash, NWC, Borrowings, Equity

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 1.283E10 | 5 | 2.566E9 | 7.213 | .039[a] |
| | Residual | 1.423E9 | 4 | 3.558E8 | | |
| | Total | 1.426E10 | 9 | | | |

a. Predictors: (Constant), fuel, Cash, NWC, Borrowings, Equity
b. Dependent Variable: Revenue

**Inter-Item Correlation Matrix**

| | Revenue | Cash | Borrowings | Equity | NWC | fuel |
|---|---|---|---|---|---|---|
| Revenue | 1.000 | -.363 | .609 | -.661 | -.814 | .491 |
| Cash | -.363 | 1.000 | -.845 | .847 | .778 | -.297 |
| Borrowings | .609 | -.845 | 1.000 | -.959 | -.869 | .506 |
| Equity | -.661 | .847 | -.959 | 1.000 | .944 | -.508 |
| NWC | -.814 | .778 | -.869 | .944 | 1.000 | -.489 |
| fuel | .491 | -.297 | .506 | -.508 | -.489 | 1.000 |

| | N | Range | Minimum | Maximum | Mean | Std. Deviation | Skewness | |
|---|---|---|---|---|---|---|---|---|
| | Statistic | Statistic | Statistic | Statistic | Statistic | Statistic | Statistic | Std. Error |
| Revenue | 10 | 102364 | 134022 | 236386 | 174157.70 | 39798.325 | .641 | .687 |
| Cash | 10 | 11396.40 | .00 | 11396.40 | 5201.3700 | 3422.37404 | .923 | .687 |
| Borrowings | 10 | 343689.20 | 184831.00 | 528520.20 | 429077.4800 | 109022.43693 | -1.485 | .687 |
| Equity | 10 | 257276.40 | -199145.10 | 58131.30 | -110653.5200 | 86846.55056 | 1.072 | .687 |
| NWC | 10 | 110791.20 | -110791.20 | .00 | -54574.2000 | 37183.41648 | .209 | .687 |
| fuel | 10 | 44572.00 | 50150.00 | 94722.00 | 76056.8000 | 14743.20436 | -.333 | .687 |
| Valid N (listwise) | 10 | | | | | | | |

**Correlations**

| | | Revenue | Cash | Borrowings | Equity | NWC | fuel |
|---|---|---|---|---|---|---|---|
| Revenue | Pearson Correlation | 1 | -.363 | .609 | -.661* | -.814** | .491 |
| | Sig. (2-tailed) | | .302 | .062 | .037 | .004 | .150 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 |
| Cash | Pearson Correlation | -.363 | 1 | -.845** | .847** | .778** | -.297 |
| | Sig. (2-tailed) | .302 | | .002 | .002 | .008 | .405 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 |
| Borrowings | Pearson Correlation | .609 | -.845** | 1 | -.959** | -.869** | .506 |
| | Sig. (2-tailed) | .062 | .002 | | .000 | .001 | .136 |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | N | 10 | 10 | 10 | 10 | 10 | 10 |
| Equity | Pearson Correlation | -.661* | .847** | -.959** | 1 | .944** | -.508 |
| | Sig. (2-tailed) | .037 | .002 | .000 | | .000 | .133 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 |
| NWC | Pearson Correlation | -.814** | .778** | -.869** | .944** | 1 | -.489 |
| | Sig. (2-tailed) | .004 | .008 | .001 | .000 | | .152 |
| | N | 10 | 10 | 10 | 10 | 10 | 10 |
| fuel | Pearson Correlation | .491 | -.297 | .506 | -.508 | -.489 | 1 |
| | Sig. (2-tailed) | .150 | .405 | .136 | .133 | .152 | |
| | N | 10 | 10 | 10 | 10 | 10 | 10 |
| *. Correlation is significant at the 0.05 level (2-tailed). | | | | | | | |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | | | | |

**T-Test**

| One-Sample Statistics | | | | |
|---|---|---|---|---|
| | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** |
| Revenue | 10 | 174157.70 | 39798.325 | 12585.335 |
| Cash | 10 | 5201.3700 | 3422.37404 | 1082.24970 |
| Borrowings | 10 | 429077.4800 | 109022.43693 | 34475.92168 |
| Equity | 10 | -110653.5200 | 86846.55056 | 27463.29067 |
| NWC | 10 | -54574.2000 | 37183.41648 | 11758.42873 |
| fuel | 10 | 76056.8000 | 14743.20436 | 4662.21058 |

## FINDINGS

### R Square

Based on the results derived from the Regression analysis, it can be concluded that R square is .900. It indicates that the model explains all the variability of the response data around its mean. The model fits the data and there is consistency in the variables taken for the analysis. Higher R-squared values signify smaller differences between the observed data and the fitted values.

### ANOVA

The value.039 is less than 0.05. Hence, alternate hypothesis is accepted. There is a relationship between cash, borrowings, equity, net working capital, fuel and revenue of Air India and it plays a significant role in the success of the organisation.

### Correlation

Fuel expenses and borrowings of the company have positive correlation on the revenue whereas cash, equity and net working capital have negative correlation on the revenue of the organisation.

### T test

The net working capital and the equity capital of the company show the negative values which indicate that the liquidity position of the company is not good and the company is not good in managing its equity capital over the years. The borrowings of the company occupies the large proportion the financial statement.

The standard deviation of cash is very less followed by fuel and networking capital. This indicates that the variation of the above parameters is less compared to the other variables such as equity and borrowings. This might indicate that the company is not able to manage its financials and needs to consider improvement in its financials.

## CONCLUSION

An analysis of financials of Air India reveals that revenue of the national carrier is mainly dependent on cash, borrowings, equity, net working capital and fuel. The data of last ten years indicates that the company is not handling its borrowings in an efficient manner. The accumulation of borrowings and lead to the financial deterioration in the company. The negative working capital over the years indicates negative liquidity due to which the company is under losses. The rising fuel prices and not having substantial revenues has become a problem for the company. The equity in relation to the revenue also shows negative correlation that means the strategies of Airlines has to be revamped to envision strategic disinvestment. If the national carrier plans to service its debt obligations, the performance of the organisation can be improved. The large amounts of foreign exchange inflows available with the organisation can be used for the restructure.

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# E-WASTE MANAGEMENT IN SAKINAKA & KURLA-1

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**ABSTRACT**
*There has been a rapid growth in electronic goods market because of innovations, low price and easy to use facilities. At the same time increasing use of ICT devices and services has generated a threat of deterioration in environmental conditions and human health when not disposed off in an organised way. The waste of electronic and electrical equipments contain hazardous components that creates a challenging task to collect the e-waste and channelize it in Recycling process properly.*

*This paper attempts to assess the present situation of e-waste management process in study area considering the present flow of E-Waste from households to Recycling Units. Usually the entire amount of e-waste generated by households is not being recycled completely. To know the causes of gap in the e-waste collection from households, survey of e-waste treatment in household sector and interviews with authorised and unauthorised dismantlers was conducted in the study area. They dump large quantity of e-waste from where the recovery of it is a challenging task for municipalities. Study also reveals that hardly 7% to 8% households are marked without any e-waste in their houses. Most of the household contain a large amount of e-waste accumulated since last 3 to 4 months or even more. This is because there is no proper channel established among the various stakeholders from households to recyclers.*

*To address the issue of e-waste management in a sustainable method, the concept of digitalized e-waste management will be helpful if the regulations incorporate monitoring. A proper channel of e-waste collection and awareness among the people will bridge the gap among the different stakeholders. In developing nations, it can help in uplifting the status of the informal sector with help of education and employment.*

*Keywords: Electronic goods, Households, Dump, Dismantlers, Digitalization, formal & Informal sector etc.*

## INTRODUCTION

Electronic industry is one of the fastest growing manufacturing industry in India (Research unit Rajya Sabha Secretariat, new Delhi (June, 2011**)**. The technological boom has opened up various avenues and opportunities for human being. As the electronic goods have become more reasonably priced, the volume of electronics goods consumption in society has increased exponentially. It is because large section of society is purchasing and using electronic goods. Given the time lag between the purchase of the product and its end of life means that products purchased one to ten years ago are being discarded now. Most of the products are either out of service or new features are added in it. The old products and features are no more useful in surrounding environment. The old products are either discarded or they have been replaced by people. But the replacement/disposal system of old electronic products is not well functionalised.

Maharashtra state is number one in e-waste production in India. According to Central pollution control board (CPCB), Mumbai is at the top in order to generate e-waste in the country. Sakinaka and Kurla are cities in Mumbai generating highest quantity of e-waste followed by Delhi, Chennai and Kolkatta.

Most of the informal units are involved in the business of e-waste collection, segregation and disposal. In the city of Mumbai people are highly engrossed with the use of electrical and electronic equipment. Because of high density of population and approach to upgraded technical equipment in city, the households units generate high amount of e-waste. Also commercial sector contributes a major part of e-waste in the city. About 90% of e-waste generated by commercial sectors is recycled ultimately. However it is very difficult to say that whatever the quantity of e-waste generated by households is being recycled completely. This gap arises because household units either dump their e-waste or do not dispose it properly. Women and children are collecting the e-waste in the metropolitan region as waste rag pickers. They are less educated and do not have much knowledge of e-waste hazards. E-waste collected by them is not equal to the actual quantity of waste dumped. Most of the times it is not possible to discard house e-waste properly because there is no proper channel for it.

Although the BMC had devised plans and taken initiatives for e waste management, the efficiency in creating awareness regarding collection, dismantling, segregation of e-waste and disposal are very low. Also it had not succeeded in setting up a proper system for the smooth flow of e waste to recycling centres .E-waste is usually regarded as a waste management problem which can cause environmental damage if not dealt with in an

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appropriate way. However the enormous resource impact of electrical and electronic equipment is widely overlooked. The electronic and electrical devices lead not only to significant environmental problems but also to systematic depletion of the natural resources. Therefore e-waste needs to manage from E-Waste generators to recycling. The gap among the various stakeholders in e-waste management process can be bridged by connecting them digitally.

**DEFINITION OF E-WASTE**

Electronic waste which is commonly referred as "e-waste" is the new By product of the InfoTech society. It is a physical waste in the form of old discarded, end of life electronic. Alternatively, it can be defined as "E-waste is electronic waste which includes a broad and growing range of electronic devices from large household appliances such as refrigerators, air conditioners, cellular phones, computers and other electronic goods". They are products which have exhausted their utility value through either redundancy, replacement or breakage.

**OBJECTIVES OF THE STUDY**

The main objectives of the study is:

1. To understand the pattern of e-waste disposal used by households.
2. To locate the gap in the generation and collection of household e-waste.
3. To estimate the total quantity of e-waste in houses without any treatment.
4. To find out the causes of gap in the collection of e-waste.

**HYPOTHESIS**

- $H_0$ : There is lack of awareness and improper e-waste disposal methods used by households.
- $H_1$ : There is significant awareness and adequate e-waste disposal methods used by the households.

**RESEARCH METHODOLOGY**

Primary and secondary methods were used to carry out the assessment in the study area.

**Sources of Primary Data**

- Field survey of house holds in the target area and interviews with authorized dismantlers.

**Sources of Secondary Data**

- Websites and reports available on net.

**Sample Size**

- 50 Households and 2 Authorized Dismantlers in Kurla-Sakinaka locality

**Importance of the study**

The data for information on e-waste is estimation and there is a problem in finding actual generation and recycling of e-waste. Most studies have concentrated on devices like mobile, computer and TVs while other domestic appliances also contribute to a considerable proportion of e-waste. There is a need to have credible data covering wide range of products across various sectors.

Waste collection, transportation, processing and recycling is dominated by the informal sector. The sector is not well networked and is unregulated. They work for maximizing their profits only. There are serious issues regarding collection of e-waste from each and every household.

The e-waste management system is mostly manual and low tech and the 'take back' by producers is limited to few IT equipment and few formal collection centres. There is lack of effort from producers that results in limited implementation of EPR. In absence of accountability and penalty criteria in the regulation, it is difficult to monitor the EPR activities.

There is a need for establishment of collection channels for e-waste from the generator to the recycler. Presently as the standards are not followed by the collectors (mainly the informal sector), the environmental, health and safety norms are hampered. The formal sector having large infrastructure and high operational cost finds difficulty in competing with the informal sector.

**DATA ANALYSIS AND INTERPRETATION**

Data for this study is collected from the primary and secondary sources. There are various reports related to e-waste, environment status report and city development report of Greater Mumbai and other sources used.

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Chart-1

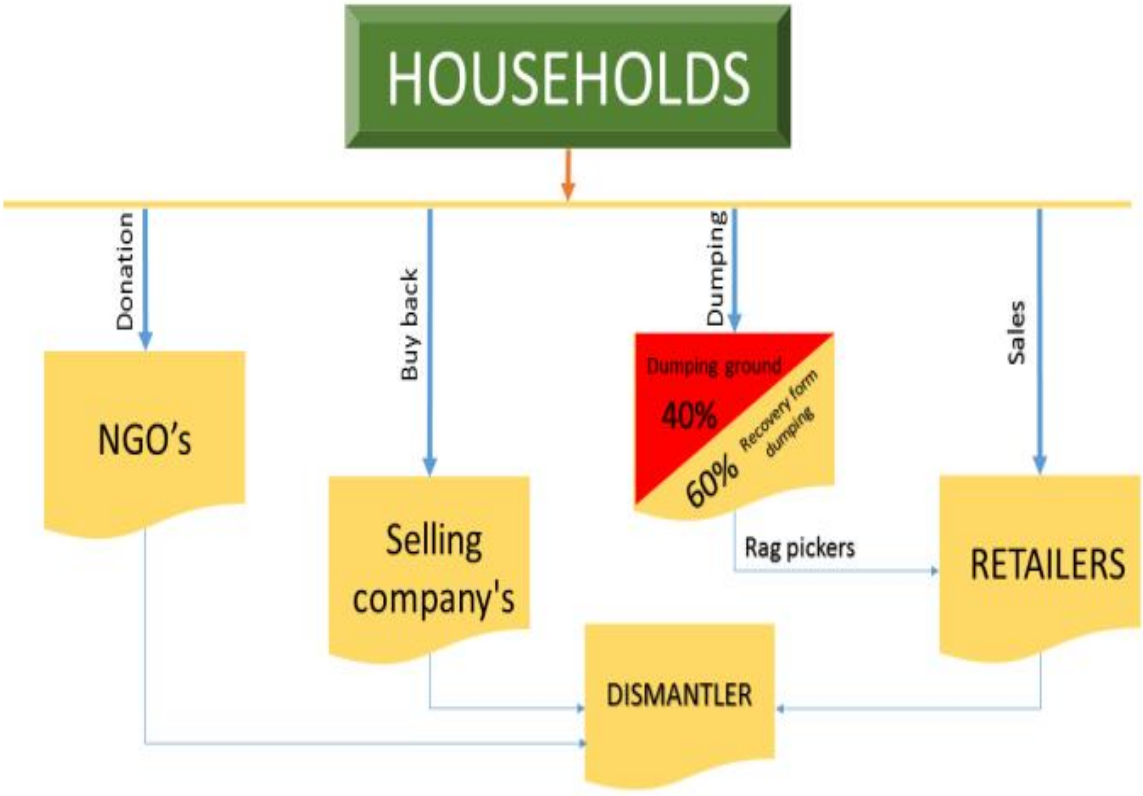


Chart-2

There are various stakeholders involved in the process of e-waste management viz. households, commercial sectors (involving industries, offices, manufacturing units etc), retailers, wholesalers, suppliers and recycling units. Households and commercial sectors are generators of e-waste in the city whereas wholesalers, retailers and suppliers follow the process mentioned in the chart-2 after the generation of e-waste. Usually e-waste of commercial sectors is recycled up to 90% whereas households e-waste are not completely injected in the process of recycling. This is because behaviour of households relating to e-waste treatment is different. (see figure -3)

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# Treatment of E-Waste by Households

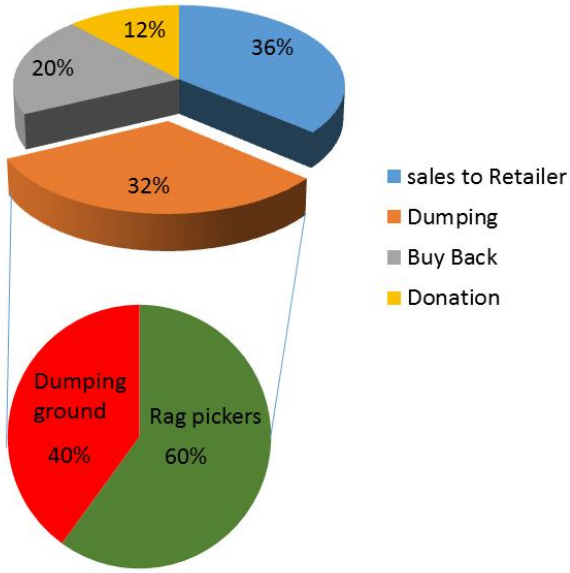


Diagram-3

TABLE 2- Estimation for treatment of E-Waste by Households

| Treatment method | Sample | Percent | Qty (in KGs) Per month |
|---|---|---|---|
| S- Sales to Retailers | 18 | 36% | 988000 |
| D- Dumping | 16 | 32% | 878222 |
| B- Buy Back | 10 | 20% | 548889 |
| DO- Donation | 6 | 12% | 329333 |
| Total | 50 | 100% | 2744444 |

Source: Compiled from data (calculation monthly basis)

*Primary Survey in Study Area ( Sakinaka & Kurla)*

As per TABLE-1 (compiled from data- primary source) it is estimated that about 36% of households in the study area sell their house e-waste to Kabadiwala as scrap in return for money but 20% of households replace their e-waste with new one under the Buy Back facility provided by manufacturing or selling companies. These companies collect the Buy Back e-waste under the EPR( Extended Producers Responsibility ) for refurbishing purpose. Very low numbers of households donate their house e-waste either to their friend circle or to NGOs working for e-waste management, which is equal to 12% which accounts to estimated 329333kgs of total household e-waste generated per month. Our study also revealed that about 32% of total household in the Sakinaka and Kurla city dump their e-waste which equals to estimated 878222kgs per month. It's really a very large quantity of e-waste being dumped by households in every month. However 60% of total dumped e-waste are collected through Rag pickers, but still remaining 40% are not channelized in the recycling process properly because of being mixed with some other solid and wet waste for a long period of time. They do not remain in recyclable condition later which is estimated to be about 351290kgs of e waste.

Q1* Do you have any E-Waste in your house since last one month or more period of time?

Q2*How much quantity of E-waste you have not been released since one month or more period of time?

Average E-Waste a Houses = 6.230769

Total E-waste in Houses = 2.046 *151964= **310918.3** KGs

total houses in study area =151964 by
1. Mumbai Wards & Districts: Population & Density by Sector 2001(http://www.demographia.com/db-mumbaidistr91.htm)- 07th December 2017 11:47 am

| House No. | Q1* | Q2* | |
|---|---|---|---|
| | | Qty (in nos.) | Qty (in Kgs) |
| 1 | Yes | 2 | 0.25 |
| 2 | Yes | 2 | 0.25 |
| 3 | Yes | 3 | 0.25 |
| 4 | Yes | 1 | 2 |
| 5 | Yes | 3 | 4 |
| 6 | Yes | 4 | 2 |
| 7 | Yes | 4 | 1 |
| 8 | Yes | 3 | 2 |
| 9 | Yes | 3 | 1 |
| 10 | Yes | 2 | 0.25 |
| 11 | Yes | 2 | 0.5 |
| 12 | Yes | 1 | 2 |
| 13 | No | 0 | 0 |
| 14 | Yes | 4 | 0.25 |
| 15 | No | 0 | 0 |
| 16 | Yes | 1 | 0.15 |
| 17 | Yes | 4 | 2 |
| 18 | Yes | 8 | 5 |
| 19 | Yes | 2 | 2 |
| 20 | Yes | 10 | 6 |
| 21 | Yes | 10 | 7 |
| 22 | Yes | 3 | 0.5 |
| 23 | Yes | 3 | 10 |
| 24 | Yes | 2 | 0.75 |
| 25 | Yes | 4 | 2 |
| Total | | 81 | 51.15 |

Table-1

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In study area about 7 to 8 percentage of total households are hardly marked without having any e-waste in their houses. It is observed that some electronic equipment like CD ROM, DVD Rider, PCB's, Laptops, Wire & Cables, Mobile charger, battery, keyboard, CRT monitors, headsets, earphones and PlayStation etc. are found in 92% to 93% households in the target area. In the process of calculation an average 2.046kgs of the e-waste is found in the houses since last 3 to 4 months or more than it. Therefore we have estimated that 15,19,664 houses accumulate about 310918.3 (kgs) e-waste which is not yet recycled in L-Ward. (figure ofTotal houses in study area is obtained by Mumbai Wards & Districts: Population & Density by Sector 2001(http://www.demographia.com/db-mumbaidistr91.htm)- 07th December 2017).

## CONCLUSION

It can be concluded on the above mentioned fact that there is no unique or proper channel for e-waste collection in various metropolitan cities, each of which is characterized by its own specific environmental, social, technological, economic and cultural conditions. An exponential growth in the use of Electrical and electronic equipment (EEE) will have an alarming effect on environment and natural resources. However government has taken various steps like EPR (Extended Producers Responsibility) and BMC has also started the E-waste collection centres in different zones of Mumbai but they have not yet been proved feasible. This is because of lack of awareness among the people and no proper access to the housing societies and households for disposal of e waste. On the other side dumped e-waste are not properly channelized in the recycling process. With a view to bridge the digital divide, there is a clear need to have proper information system and ideal model for e-waste collection by using Smart Phone Applications. It is also need of the hour to spread awareness at a larger scale among consumers of electronic devices regarding the hazards of e waste accumulation in households and using of unscientific means of disposal.

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# BASIC SERVICES IN URBAN INDIA: THE STUDY OF SANITATION IN KALYAN- DOMBIVLI CITY

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**ABSTRACT**
*Increasing urbanization and globalization era has brought new dimensions to the concept of Governance. The role of government in facilitating reforms in the governance processes at the local levels to build capacities to meet the demands for basic services gets highlighted. Equally noted is the gradual withdrawal of active state government involvement in urban politics and development. Sanitation is the premier basic service provided by the Municipal Corporation as part of their obligatory functions. This research paper will highlight the Issue of Sanitation in Kalyan-Dombivli city. The research paper will also highlight on measures taken up by the officials in dealing with the issue of sanitation which concerns the day to day life of people living in the vicinity*

*Keywords: Governance, Basic Services, Sanitation, Kalyan-Dombivli.*

## INTRODUCTION

The concept of Governance is getting new dimensions with increasing urbanization and globalization era. New spatio- economic changes are noted across the world , including India. These changes typically involve deregulation of economy privatization, structural adjustment, and decentralization of political processes. These changes have raised the expectations citizens, for a better life with greater development in all spheres including Governance.. The concept of governance comprises of complex mechanisms, processes, institutions, and relationships through which citizens and groups articulate their interests, exercise their rights and mediate their differences (Mohan Sudha, 2005).The role of state in urban governance has also been undergoing changes all over the world including India.

Urban Governance has seen many changes in the last few decades . Indian cities are seen today as engines of growth .The urban governance need to work in response to these changes and trends. The role of government to build capacities and meet the demands for basic services gets highlighted. The gradual withdrawal of active state government involvement in urban development is also seen. Most municipal authorities are not in a position to meet their financial needs to fulfill their responsibilities.In the Indian context, the new role of state in governance emerged after globalization especially after the passage of 74$^{th}$ Constitution Amendment Act in 1992. In the context of urban India, the 74$^{th}$ Constitutional Amendment Act was a milestone as it gave Constitutional validity to Urban Local Bodies. Maharashtra complied the act , by passing the Nagarpalika Act in 1994.

Maharashtra is one of the most urbanised States in India. The last few decades have witnessed large scale expansion and this pace of urbanization in cities are causing increased burden on local government agencies to arrange for the delivery of basic provisions and public goods to the local citizens. To accommodate the increase population and meeting their demand for land, the cities are increasingly looking at peripheries. The urban peripheries play an important role in the economic growth of the cities. Inspite of this, little has been done for the people staying in the peripheries. There are inadequacies in basic service provision in Kalyan –Dombivli which is an important periphery in Mumbai Metropolitan Region.

## RESEARCH AIMS AND OBJECTIVES

- To understand the concept of Urban Governance with reference to Kalyan-Dombivli city.
- To analyse the status of sanitation and open defecation in the twin city.
- To study the socio-economic profile of sample households in the study area.
- To suggest remedies for better service delivery in sanitation service in the Kalyan Dombivli city.

## RESEARCH DESIGN & METHODOLOGY

The present study will be multidisciplinary with descriptive analytical framework. Research design is flexible enough to provide opportunity for considering different aspects of the urban governance.The research will be of qualitative and quantitative work. The data was collected with the help of primary and secondary data. Interview and survey were conducted in the areas. A number of reference books, journals , articles & government reports and publications were also be referred during the work. Primary data through survey of 100 citizens from different wards from the twin city of Kalyan –Dombivli. This paper is a part of my research work for Ph.D.

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**SANITATION SERVICES IN KALYAN DOMBIVLI**

Service delivery is understood as a means adopted for more inclusive standards and planned. The policies of the government should be to protect the weak against the strong and poor against exploitation by rich group and to formulate laws to provide equal opportunity and social order. The issues relating equity is directly related to service delivery at the local level .

Sanitation is the premier civic service provided by the Municipal Corporation as part of their obligatory functions. Basic services have a direct and immediate effect on the quality of the lives of the people in that community. For example, if the sanitation that is provided is of a poor quality it will contribute to the creation of unhealthy and unsafe living environments. Cities should impartially provide services and infrastructure to all the stakeholders by maintain a balance between commercial viability and servicing the stakeholders with the aim of closing the service gaps.

This research paper is a part of an ongoing research work on Kalyan Dombivli area, here emphasis is on service delivery especially, sanitation services in the area. Cities and towns of India are visibly deficient in the quality of services they provide, even to the existing population. Same is true with the twin city of Kalyan-Dombivli.

Kalyan-Dombivli is a twin city with a municipal headquarter at Kalyan . It is currently served by the Kalyan-Dombivli Municipal Corporation (KDMC) which was established in 1983. Kalyan –Dombivli.(KD) is one of the fastest growing regions in India (Pethe et al., 2011). KD has witnessed tremendous growth in population during the last few decades due to limitations with the physical expansion of Mumbai towards the west and south, (CDP, 2012) The Municipal Corporation area has gone several changes since its formation. It now includes the cities of Kalyan, Dombivli, and 27 surrounding villages. KDMC is governed under Maharashtra Municipal Corporation Act of 1949. Kalyan Dombivli Municipal Corporation (KDMC) is the main organization which is responsible for urban governance and civic management in the city of Kalyan Dombivli. (Baid,2008)

Changing mindsets is often difficult than changing technology. KDMC in tune with the Government of India new initiatives is emphasizing on changing behaviours of citizens , alongside with technological advances, as the key to effective sanitation. In this context , the central government has impressively moved towards achieving Open Defecation Free (ODF) in India by building millions of toilets. In an attempt to inspire people to make behavioural changes, 20$^{th}$ November is observed as World Toilet day . As a part of this initiative, The Ministry of Urban Development (MoUD) has announced an award plan, , to motivate citizens to achieve total sanitation. The Nirmal Shahar Puraskar (Clean Cities Award), designed along the lines of the rural sanitation rewards scheme, honors cities that achieve total sanitation, including open defecation-free (ODF) status and 100 percent safe waste disposal.

After the passage of 74$^{th}$ CAA, the basic objective of an urban local government has changed from the maintenance of law and order in the early years to the promotion of the welfare of the community in recent times. The State municipal Acts provide an exhaustive list of functions, which are classified into obligatory and optional or discretionary functions. The former have to be necessarily performed by the local government and for which sufficient provision in the budget has to be made. Failure to perform any of these functions may compel the State government to supersede a municipality. Discretionary functions may be taken up depending upon the availability of funds. . KDMC has also tried to provide Sanitation services to its citizens under the central government schemes.

The sanitation department is trying to provide effective services in solid waste management.It also want to Make the twin city Open defecation free. With regard to understanding sanitation service delivery in the area ,People in the area and officials of the concerned department were interacted and interviewed.

As per discussion with officials in KDMC Sanitation dept .around 650 metric tones waste is treated per day .Around 180 vehicles (Ringers and dumpers) ply across the twin city to collect the wastes. The department through its initiatives have tried to spread awareness during last few years. Approximately 1234 toilets are built under Nirmal Abhiyaan. Kalyan Dombivli Municipal Corporation in tune with the Central Government Programme implemented Sanitation programmes and policies.

KDMC is providing sanitation services in the twin city. As per the officers capital investment of appxt.Rs. 900 crores is required in sewerage and sanitation in KDMC. Following issues were noted during the interactions with officials of the Sanitation Dept. of KDMC :

- 100% coverage of the underground drainage in the city is yet to be achieved.
- 100%treatment of sewage is yet to be achieved

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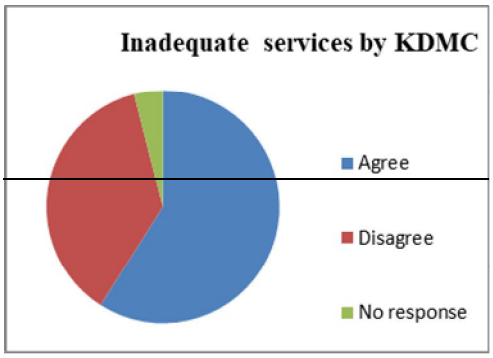
- Open defecation spots are seen which needs immediate attention.
- Developing Civic sense and gathering peoples participation is required.

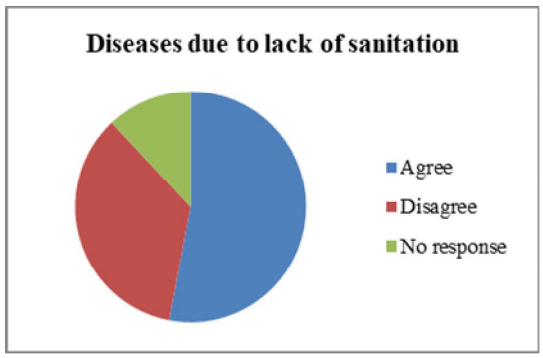
**Following measures are taken by KDMC for improving the sanitation service delivery mechanism**

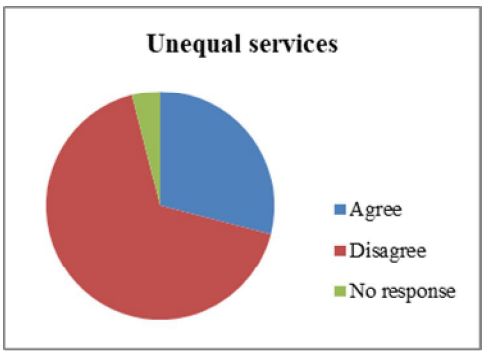
- A no of Slum improvement programmes are undertaken by KDMC .
- Around 80,000 dwelling units are to be constructed KDMC to become a slum-free city.
- 2448 individual toilets created and additional 12000 per seat need to be planned.
- Community bins placed unloaded every day, besides these garbage collected twice in Market areas through dumpers, vehicles
- Awareness Drives regularly conducted to educate the people about dry and wet waste management, anti-plastic .open defecation, diseases etc.(Excerpts from officers-KDMC)

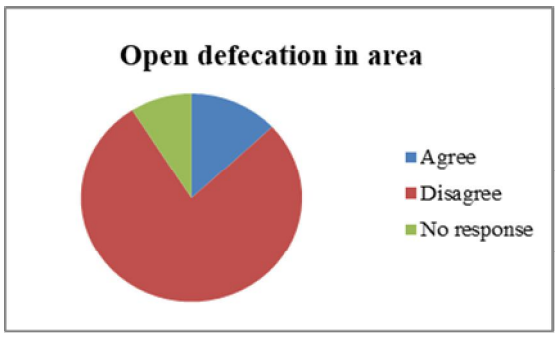
A small pilot survey conducted in the area for this research paper gives the following analysis.

| Questions | Agree | Disagree | No response |
|---|---|---|---|
| Inadequate sanitation services by KDMC | 59 | 37 | 04 |
| Diseases due to lack of sanitation | 53 | 35 | 12 |
| Unequal services | 29 | 67 | 04 |
| Open defecation in area | 13 | 78 | 09 |




Out of 100 people surveyed, only 37 were satisfied with the sanitation services in the area. Many feel that disease like diarrhea, malaria ,are spread due to lack of Services Most of the people especially in slums complained of garbage and diseases related to the issue of sanitation. Also few people viewed that unequal service delivery is noted certain areas with different community.However open defecation spots are very less in number. Although KDMC is trying to provide services , people feel that the services are inadequate. One of the reason for inefficiency is the lack of financial recourses. The taxes collected from the KDMC doesn't suffice the increasing demands of basic services by the citizens. Further the corporation has additional burden of service delivery to the citizens in 27 villages which are added to KDMC .

**CONCLUSION**

As per the 74$^{th}$ CAA 1992,the KDMC has regularized its functioning in a planned and disciplined manner. The much hiped programmes and schemes of the central government ,such as Swach Bharat Abhiyaan ,AMRUT, in their initial stages were implemented throughout the different wards in the twin city with wide publicity but showed dismal results as years passed. There are many obstacles in its service delivery due to lacunae of

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funds. Because of this it is difficult for KDMC to provide access to basic services ,in particular, Sanitation. KDMC can provide efficient and effective services only with adequate funds and with people's participation. Public-Private partnership and community-based projects can be taken up as few options for undertaking investments in basic amenities due to resource crunch in the corporation.

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# GLOBAL POLITICS

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**ABSTRACT**
*Politics, in its broadest sense, refers to the activity through which people make, preserve and amend the general rules under which they live. Global politics, the practice of international politics base on harmony, peace, resolution of dispute, friendship, communication and sustain peace among nations. This research paper will try to focus on the term of global politics with reference to Conflict ,peace and harmony. It also try too suggests measures to solve conflicts in the global politics.*

*Keywords: Global Politics, Conflict, Peace and Harmony*

## INTRODUCTION

POLITICS, in its broadest sense, refers to the activity through which people make, preserve and amend the general rules under which they live. Politics is inextricably linked to the phenomena of conflict and cooperation, on the one hand the existence of the rival opinions, different wants, competing needs, and opposing interests, guarantees disagreement about the rules under which people live. On the other hand, people recognize that, in order to influence these rules or ensure their enforcement, they must work with others. POLITICS, is an essentially contested concept, it has been defined, variously, as the art of government, as public affair generally as nonviolent, Resolution of disputes, and as power and the distribution of resources. (Heywood 2014).

The purpose of this topic is to let known that politics does not end only in political parties or elections, there are many things attached to politics.Politics is thus the Art of Government ,Public affair , Nonviolent ( Example Mohandas Karamchand Gandhi 1869 -1948),Resolution of disputes ,Power, Distribution of resources. After explaining the concept of politics, this research paper will try to examine the concept of global politics, global politics different from international politics. How does global politics different from International politics? The term 'global' has two meaning

- Global means worldwide not regional or national .
- Global politics in the sense, refers to politics that is conducted at a global rather than a national or regional level.

Global politics the practice of international politics base on harmony, peace, resolution of dconflicts , friendship, communication and sustain peace among nation with exercising Internationalism, Collective dilemma, Globality ,Globalism ,Diplomacy Authority, Security, State system . The 3 aspects of Global Politics covers Power ,Security&Justice (Michael Foucault,2007).

Global or Worldwide dimension of politics has, in recent decades, become more significant. It has also become important to international organisation such as UN, WTO, IMF, World Bank. In era globalisation, peace and harmony have become important concept in global politics. Globalisation is the process of emergence of a complex web of interconnectedness that means that our lives are increasingly shaped by events that occur, and decision that are made, at a great distance from us .

## OBJECTIVES OF THE STUDY

1. To understand the concept of global politics
2. To examine the issues of conflicts in global politics
3. To suggest remedies to solve conflicts and maintain peace and harmony in the globe .

## RESEARCH METHODOLOGY

This research study is based on secondary sources .Various books, reference books, and journals were referred. Journals and books through Websites were also referred .

## CONFLICT IN GLOBAL POLITICS

- Conflict has become an important issue in global politics . Perhaps more than at any time in our history, today our world is engaged in conflict. From the UK and USA engaged at war in Afghanistan and Iraq, through to insurgencies in Algeria, Burma and Columbia, civil wars in African nations, and conflict between people in China, Iran and Israel, we see that we are in a fragile landscape and conflictInternational conflict has been accounted for in many different ways—in terms of aggressive "instincts," territoriality, population

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growth, the search for basic resources, the protection of trade routes, a drive for imperialist control, and so forth. Some theorists have considered grievances, competition, anxieties, tension, threat, and provocation to be of special importance. Others have laid heavy emphasis upon national power or capability, military preparedness and the competition for dominance. In short, there are various issues like war, terrorism, religion, xenophobia, discrimination, power politics throughout the countries in the World. These issues create conflicts within the nations.

The big question is how will humanity move forward to create solutions for conflict?The United Nations through it resolution have try to resolve conflict in international arena. Following are some of the initiatives of UNO :

- 1948 Universal Declaration of Human rights,
- 1951 Genocide convention (Convention on the Prevention and Punishment of Genocide)
- 1990 Convention on the rights of child

**CONFLICT RESOLUTION BY NATIONS**

Apart from UN ,countries across world should try to resolve conflicts .While it isn't possible to prevent all conflict, there are steps that you can take to try to keep conflict to a minimum. One way to manage conflict is to prevent it from occurring in the first place. Preventing conflict is not the same as avoiding conflict. Preventing conflict means behaving and communicating in a way that averts needless conflicts. Some of the method of solving conflicts are :

- Security: To be safe from harm, the absence of threats, security may be understood in national, international, global or human security. Security is an impartant concept on Conflict resolution.
- Hyperglobalism: The view that new, globalized economic and cultural pattern became inevitable once technology such as computerized financial trading, satellite, mobile phones and internet became widely available.
- Role of Technology: At present ,technology is under-utilised in peace building and state building, but it is important to keep it in context as a tool. To get the best out of technology, you must have the processes to support it. Technology should be an enabler to support local and national administration.. Looking at the regions of conflict and development, connectivity plays a big role.
- Authority: The right to influence the behaviour of another on the basis of an acknowledged duty to obey power cloaked in legitimacy. Role of leaders and authorities also becomes important in Conflict resolution.
- Peacekeeping & Peace building : Peacekeeping is defined by UN as a way to help countries torn by conflict create condition for sustainable peace.Peace - building is a long terms process of creating the necessary condition for sustainable peace by addressing the deep rooted, structural causes of violent conflict in a comprehensive manner. Strictly, peace building is a phase in the peace process that occur after Peace making and peacekeeping have been completed.
- Role of governments, supra-nationals (e.g. UN), and military forces: NGOs working alongside government, military and civilian actors in any situation. They can add value to a situation such as peace mediation and state building.They may get funding from governments to carry out specific missions. Together, NGOs , governments, supra-nationals (e.g. UN), and military forces create a collective capacity for peace-building.
- Role of Media: **T**he media can play a hugely positive role, but can also be very harmful. One of the main positives is increased knowledge and visibility of situations, specifically the transmission of human rights violations and other internal issues. This makes it difficult to turn a blind eye or deny knowledge and means that we (as society) have to react if governments are not protecting their citizens; it brings a sense of responsibility. We see this too where, for example, when peace workers are kidnapped, the media pressure can help make things happen. The reporting must, though, be factual and appropriate. There must be a good dialogue between practitioners and the media.

**CONCLUSION**

We are now living with a great deal of uncertainty, which will increase.. What is important to look at is the causes of conflict, the issues of state fragility, injustice and inequality As a society, though, we have to be prepared for threats we cannot conceive, we must build resilience not just in developed countries, but particularly in conflict areas. Global politics is an everlasting field, with, if anything, the pace of change

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accelerating over time. Recent decade have witnessed momentous event such as the Cold War, the collapse of the Soviet Union, the September 11 terrorist attacks on the USA and the global finance crisis of 2007 - 2009,power struggle and conflicts across world . There has never been such an acute need for the international community to work together to develop innovative solutions and practical responses to these crises. This calls for coordination amongst international actors and a need to find common means and common language and for multi-faceted and multi-disciplinary approaches to problems. No political crisis or conflict can be solved without also seeking to create economic opportunities and employment as means to promote sustainable security.

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# REPLACEMENT OF TOXIC CHEMICALS FOR SAPONIFICATION OF OIL FOR A BETTER MACRO AND MICRO ECONOMY

**Ashish Singh**
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## ABSTRACT
*The research paper reports the parallel option to the toxic solvent like petroleum ether and n-hexane which are creating a high adverse effect on the environment with iso propyl alcohol for the extraction and saponification of avocado oil that is required for the manufacturing of soaps and it also impacts the Indian economy on the higher extent.*

*Keywords: Petrolium ether,n-hexane,avocado oil,saponification,Indian economy.*

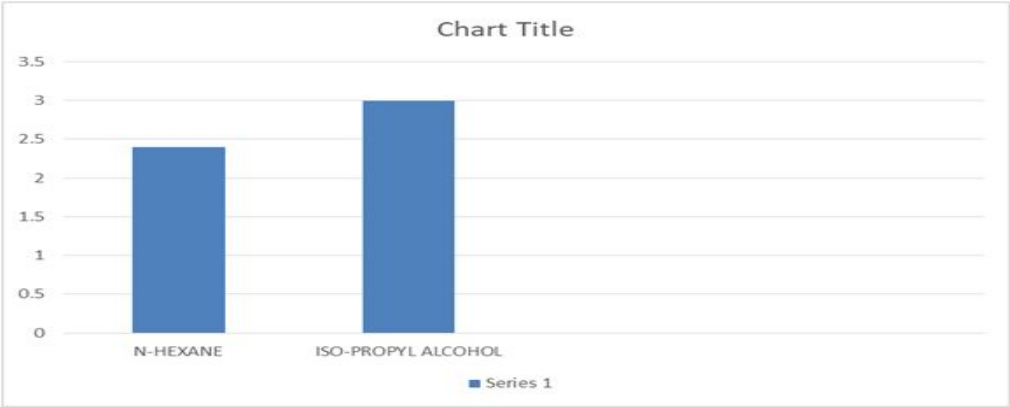
## INTRODUCTION
In tis updated project,both the oil extraction and soap making techniques are combined in a way that illustrate the connectivity between seemingly desparate industrial processes.The experiment has also recognised the presence of fats and oils in food and utilized a greener solvent iso propyl alcohol than that of the regularly used n-hexane and petroleum ether.Iso propyl alcohol is not only regarded as a highly efficient solvent but is also easily degraded in water and air very much easily.

## METHODS AND MATERIALS
An avocado was peeled,The pile was removed and flesh was extracted by iso propyl alcohol.The decanted solvent containing the oil was evaporated by using water bath .The oil along with solid fat was saponified by mixing with aq.NaOH.It took around 30 minutes to mix the solution.Bar of soap were cured for 2 months during which time the saponification reaction continued and the pH of the soap decreased from less than 12.The yield was reported directly and same method was utilized using the regular method too.The lab assessment procedure indicated that we were able to concepturize the theory behind the extraction.

**GLYCERIT-8-ESTER +NAOH (aq.) →SOAP + GLYCERIN**

## OBSERVATION
**A) INCASE OF ISOPROPYL ACOHOL:** The average amount of fat obtained was 3 gms of aocado oil oer evacado where iso propyl alcohol was used to break down cell structures.It took around 35 minutesto complete the reaction

**B) INCASE OF N-HEXANE (TOXIC):** The average amount of fat obtained was 2.4gms of aocado oil oer evacado where n-hexane was used to break down cell structures It took around 41 minutesto complete the reaction




## CONCLUSION
In terms of yield and in terms of time consumption,the yield,iso-propyl alcohol(non-toxic) was far better than that of the toxic one because the toxic chemical resulted to the adverse impact like shellfish harvesting ban,decreased oxygen content in water etc.

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# SYNTHESIS AND CHARACTERIZATION OF NEODYMIUM N- ACETYL 4-AMINO BENZOATES

**Bindu Mishra**
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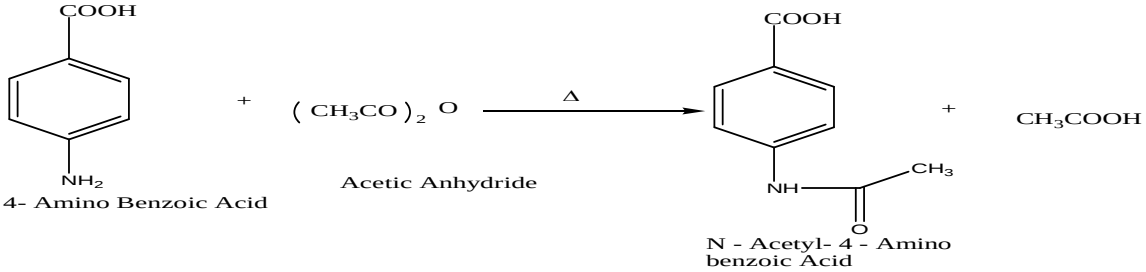
## ABSTRACT
*The report has been appeared on the compound of 2,3,4-amino benzoic acidswith various divalent metals and rare earths.The investigations of some metal complexes with N-substituted 2-amino benzoic acid has been carried out.The synthesis of metal amino benzoates has been covered and followed by their IR absorption spectral studies and the assignment of the various vibrational bands has been done.It has been found that the motions of the OCO group in particular are very sensitive to the environment and consequently the nature of the bonding between the lanthanide ion and OCO group greatly alters the vibrations of the carboxylate ion.The results of these investigations have been used in determining the thermal stability and nature of any intermediate and the composition and nature of the final residue.The significance of these complex is in preventing hair loss and for anti-aging.The N-acetyl-4-amino benzoic acid has been prepared by acetylation of the amino group using acetic anhydride and acetic acid.*

*Keywords: N-acetyl-4-amino benzoic acid,Thermal stability,Acetic Anhydride.*

## INTRODUCTION
### Materials and Method
### Materials
The starting materials used in the present investigation were of high purity. The rare earth oxide Ln2O3(where Ln=Nd) having 99.99% purity were procured from “Indian Rare Earth Company”. The other chemical used for preparation and analyses of compounds are listed in following :-

4-Amino benzoic acid ,Acetic Anhydride,Acetic acid,EDTA sodium salt, zinc oxide,Hydrochloric acid ,aqueous ammonia solution,Eriochrome black T,Hexamine, Xylenol orange.

### PREPARATION OF N-ACETYL DERIVATIVE OF 4-AMINOBENZOIC ACID:
The N-acetyl-4-aminobenzic acid was prepared by acetylation of the amino group using acetic anhydride and acetic acid23.The product obtained was filtered, washed with distilled water and recrystallized using 50% ethanol. The melting point of the derivative was checked after drying.




Chemical composition and physical constants of N-acetyl-4-aminobenzoic acid:

Melting Point: 248 °C-250 °C

Empirical Formula: C9H15NO3

Molar Mass: 179 g mol-1

| %C | | %H | | %N | |
|---|---|---|---|---|---|
| Calcd | Found | Cacld | Found | Calcd | Found |
| 60.33 | 59.77 | 5.06 | 6.71 | 7.82 | 7.87 |

### PREPARATION OF RARE EARTH CARBONATES
The rare earth oxides were converted to their respective carbonates to facilitate their reactive ability with N-acetyl-4-aminobenzoic acid. The oxides were dissolved in dilute (1:1) HCl. The solution so obtained was evaporated by precipitation from homogenous solution using trichloroacetic acid and ammonia. The precipitate was filtered off, washed with hot water till free from chloride, then with acetone and finally air dried.

M (C2ClO2)3 + 3H2O → M2(C03)3 + 3CO2 + 6CHCl3

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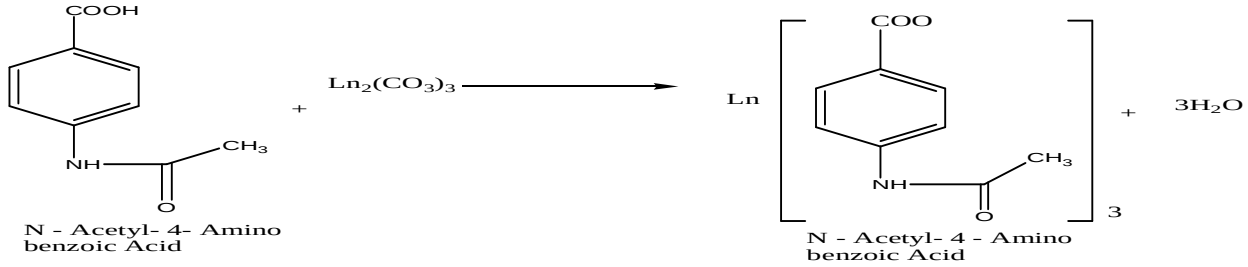
**PREPARATION OF RARE EARTH N-ACETYL-4-AMINOBENZOATES**

N-acetyl-4-aminobenzoic acid was suspended in distilled water kept on a steam bath. The rare earth carbonate was added to this suspension in small quantity at a time, and allowed to react. The next portion of the carbonate was added after the previous had reacted completely. The total rare earth carbonate added was such that the ratio of Ln3+ acid was 1:3 .Therefore compounds formed were sparingly soluble; the resultant mixture was diluted with distilled water in each case and heated on a steam bath to dissolve the compounds. The hot solutions were immediately filtered in a porcelain evaporating dish and the filtrate was allowed to evaporate naturally. The crystals obtained were air dried and analyzed chemically.




**METHODS OF ANALYSIS**

**Determination of Metal Content**

Metal content of rare complexes were determined complex metrically by using EDTA25.

The sample to be analyzed was weighted accurately and dissolved in conc.HCl.Then the metal ion solution was titrated against standard 0.01 m EDTA using Xylenol Orange as an indicator and pH was maintained to 6 to get color change from pink to lemon yellow.

The EDTA solution was standardized by using 0.01M Zinc ion solution using Erichrome Black T indicator at pH10.The amount of rare earth ions present in given sample was calculated from the titre value using following relation:

1.0 cm3 0.01M EDTA = [A×0.001] mg of Ln3+ions

[A=molar mass of metal]

DETERMINATION OF C, H, AND N:

The carbon and hydrogen content in each complex was determined by Priegel's dry combustion technique while Nitrogen was determined by micro Dumas method.

C, H and N ELEMENTAL ANALYSIS:

| Metal | n | % H2O | | %M | | % C | | % H | | % N | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cal. | Obs. | Cal. | Obs. | Cal. | Obs. | Cal. | Obs. | Cal. | Obs. |
| **Nd** | **2** | **5.04** | **5.90** | **20.70** | **21.36** | **42.18** | **42.61** | **3.56** | **3.87** | **5.88** | **5.82** |

1H – NMR Spectra for N-acetyl-4-aminobenzoic acid and it's complexes

| Compound | $-CH_3$ | -NH | $C_6H_5$(2H) | $C_6H_5$(2H) | -COOH |
|---|---|---|---|---|---|
| **N-acetyl-4-aminobenzoic acid** | 2.063 | 10.231 | 7.874 | 7.682 | **12.641** |
| **Nd-N-acetyl-4-aminobenzoic acid** | 2.085 | 10.402 | 9.499 | 8.206 | - |

NMR- Spectral studies of rare earth N acetyl 4 amino benzoates: For NMR analysis sample was dissolved in DMSO solvent. Basically an NMR spectrometer requires components with functions similar to those already described to IR spectroscope techniques (Radio frequency source, sample holder, Radio frequency detector, Recorder etc.) but with addition of powerful magnet. Electromagnets can achieve fields up to a little over 2.5 T. higher fields. Higher field require the use of "superconducting" magnets. The sample of course is placed in a thermally insulated cavity in the field and is not at the temperature of liquid helium, it is often desirable to record NMR spectrum at a variety of temperature by passing a stream of Nitrogen, pre-cooled or pre-heated to the required temperature, round the sample in its holder. The 1H- NMR spectra for N-acetyl-4-aminobenzoic acid and its N-acetyl-4-aminobenzoic complexes are tabulated in table. 1H- NMR spectrum of the N-acetyl-4-aminobenzoic acid .1H- NMR spectrum of Nd are produced in fig. The COOH proton signal present in the spectra of N-acetyl-4-aminobenzoic acid is absent in rest of complex compounds, clearly indicating replacement of hydrogen by rare earth metal. The methylene proton signals are obtained at 3.0 ppm with their chemical shift

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positions almost the same as in case of the acid spectrum. The –NH peak are obtained at 8.8-8.3 ppm for N-acetyl-4-aminobenzoic acid spectra and its transition metal complexes. The aromatic signals are obtained at 7.4-7.9 ppm nearly do not shift significantly, thus showing that the magnetic environment of the aromatic ring.

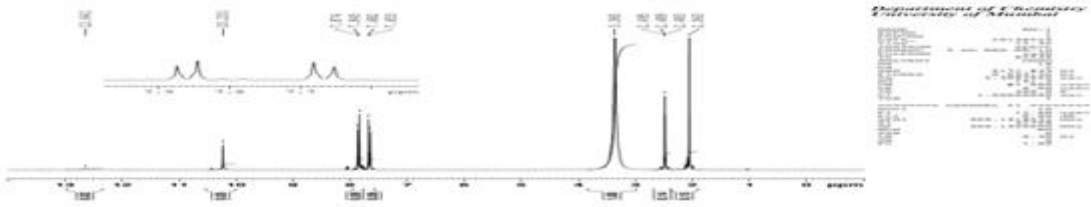

**Fig. $^1$H NMR of NA4ABA**

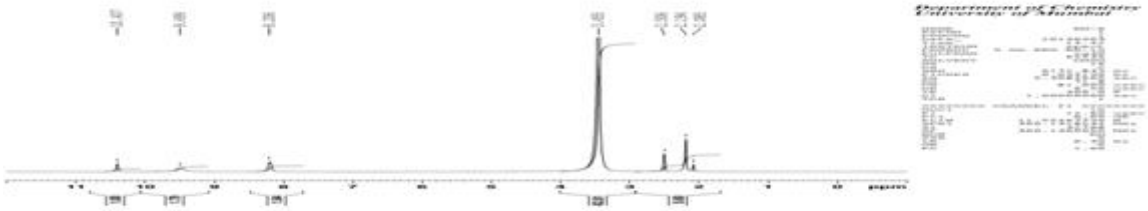

**Fig. $^1$H NMR of Nd-NA4AB**

**IR ABSORPTION SPECTRAL STUDIES**

The IR absorption spectra of the synthesized rare earth N-acetyl aminobenzonates were scanned on Shimadzu FTIR-4200 dual beam spectrophometer in the range 4000-400cm-1 using KBr disc technique.

Infrared Absorption Spectral Studies of rare earth N acetyl 4 amino benzoates:

The infrared absorption spectra of N-acetyl 4-aminobenzoic acid and sodium salt of acid are reproduced in Fig and those of the rare earth compounds, are reproduced in Fig . The spectral data of all the compounds are collected in Table

The spectrum of the acid depicts a broad absorption in the range 3400-2000 cm-1 consisting of six bands. The sharp band at 3306 cm-1 is characteristic of N-H stretching vibration of the amide group. A broad band at ~ 3000cm-1 can be assigned to O-H stretch and the remaining bands may be due to overtones and combinations of the bands at ~ 1300cm-1 and 1400 cm-1.

In the spectral region 1700-1600 cm-1, two bands are expected due to C=O stretching of the amide group.

There are two bands at~1405 cm-1 and 1425 cm-1 in the spectrum of the acid. One of these bands is due to O-H deformation and the other one due to C=C of the aromatic ring. One of the two bands at 1300 cm-1 is probably attributable to C-O stretching.

**Table: The spectral data (cm-1) of all the complexes have been reported as follows:-**

| Acid | Nd | ASSIGNMENT |
|---|---|---|
| 2816.24 | 3313.88 | O-H Stretch $H_2O$ |
| 3300.90 | 3313.88 | N-H Stretch |
| 1520.24 | 1604.56 | C-H Stretch aromatic |
| 1110.25 | 1177.98 | C-H Stretch alkane |
| 1366.71 | 1548.21 | -C=O Stretch (acid) |
| 1668.31 | 1668.88 | -C=O Stretch (amide) |
| 1129.62 | 1107.90 | - N-H bending |
| 1064.31 | 1518.56 | -OCO $stretch_{(as)}$ |
| 1427 | 1262.84 | -OCO Stretch (s) |
| 1606.55 | 1668.88 | C=C stretch (in ring) |
| 1262.52 | 1010.34 | $-CH_2$ bending ($deforma^n$) |
| 1771.07 | 1045.23 | C-O stretch |

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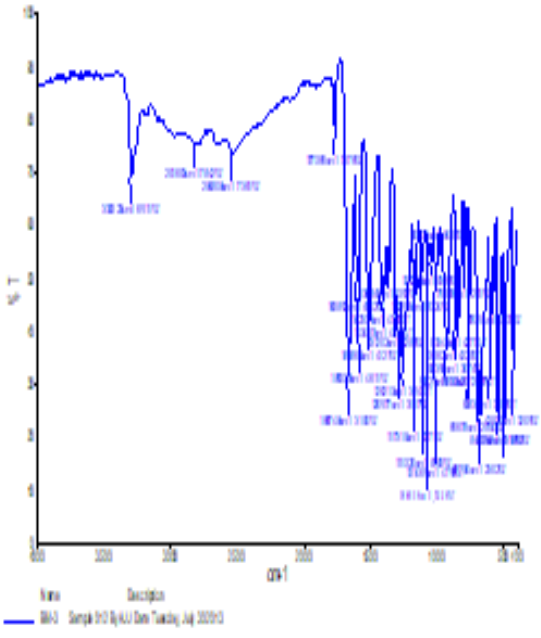

Fig-IR spectra of A4ABA

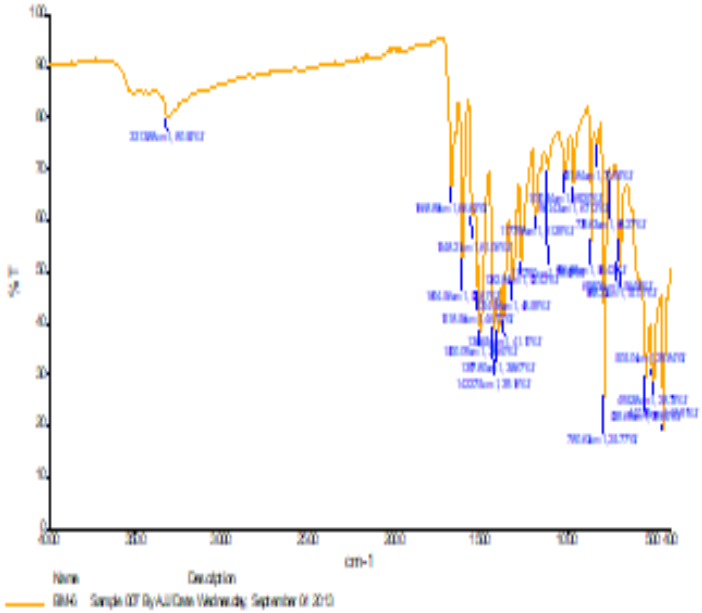

Fig-IR spectra of Nd-NA4AB complex

Chemical Analysis and Characterization by Powder X-ray Diffraction Pattern:

The method of preparation of these compounds was similar to that of N-acetyl-4-aminobenzoates consisting of the reaction of rare earth carbonates with N-acetyl-4-aminobenzoic acid followed by filtration of the unreacted carbonate and natural evaporation of the resulting solution. However, more than one type of crystal usually appeared on complete evaporation of the solution and this problem persisted even on recrystallisation of the compound after its redissolution in water. Attempts were made to separate the major phase obtained which was then subjected to chemical analysis and characterisation using XRD, IR spectroscopic techniques. The X-ray powder diffractograms of the compounds shownin fig. indicate the isomorphism of the compound containing the same number of water molecules of crystallization. The Corresponding XRD data are given in Table

XRD Analysis

The X-ray powder diffractograms of the complexes synthesized were taken on X Ray Diffractomater –PAN Analytical

Radiation used: CuKα (λ =1.54056□)

Voltage: 40 kV; Current: 30 mA

Detector: Xcelerator

Scan Range: 2θ = 5-60°

Sample Size (length):10 mm

**Table: Data of XRD of rare earth aminobenzoate:**

| Nd-NA4AB | | |
|---|---|---|
| **2theta** | **d/A°** | **I/I0** |
| **11.9231** | **7.41664** | **100** |
| **19.9448** | **4.44813** | **37** |
| **7.9439** | **11.1204** | **31** |

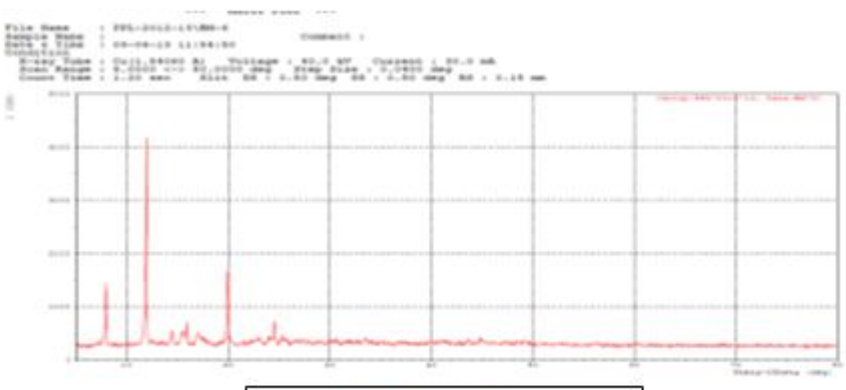

Fig: XRD of Nd-NA4AB

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## CONCLUSIONS

The rare earth N-acetyl-4-aminobenzoates Ln(C6H4 (NHCOCH3)COO)3.4H 2O where Ln= Nd have been prepared by the reaction between N-acetyl-4-aminobenzoic acid and respective carbonates.

The frequencies of antisymmetric O-C-O stretching vibration and symmetric O-C-O stretching vibration showed small shifts.

The X-ray diffractograms of all the compounds were found to be similar suggesting isomorphism amongst them.

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# STUDIES ON DEVELOPMENT OF TOURISM IN SINDHUDURG WITH REFERENCE TO SUSTAINABLE DEVELOPMENT

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**ABSTRACT**
*Sindhudurg district is district well known for its natural endowments and as tourist district. But the district is lagging behind in attracting tourists due to various reasons as compared to the neighboring state of Goa. Tourists expect all those minimum facilities with best qualities like variety of food, cleanliness and other services at their best etc. As there are several cultural, historical as well as naturally rich places, many tourists from different states, localities and countries visit those places frequently. But due to improper care and negligence, it has been found that those places have become massy. Even proper tourist guides are also not available at different places. The concept of sustainable tourism is one such approach that can balance tourism with it stakeholder's relationship, managing effects of globalization to the advantages of tourism development. Sustainable development is an approach that has found much favor recently both in academic and business world. Sindhudurg has tremendous potential of developing tourism along with sustainable maintenance of the natural resources available in and around. That can be converted into economic growth, social integration and creating larger foreign exchange earnings. A large number of opportunities can be established in terms of employment. And so can support large source of income in the district as well as can raise the economic status of the district itself. Thus development of tourism along with well stabilized sustainable development can be achieved by proper planning and implementation of plans.*

*Keywords: Sindhudurg, Tourism, sustainable development, problems, needs*

## A] INTRODUCTION

Sindhudurg district is a well known tourism district in Maharashtra. It is situated along the coast of South Konkan. It is also known as **Malabar.** Topographically, it is located on $16^0$ 4' N t0 $16^0$ 8' N and $73^0$ 8' E to $74^0$ E. It has been endowed by a natural seacoast of approx.120Km. The total geographical area of the district is 5,219 sq. km. It has ranges of the **Western Ghats** of Sahyadri on the **East** which slope down towards the Arabian Sea. On their top towards the East, they represent the plateau of the Deccan leading to the Kolhapur district. It has the Arabian Sea on its **West while** Ratnagiri district on its **North** and the State of Goa on its **South.** State of Goa is very close to the district. The district includes total eight Tehsils named as Devgad, Dodamarg, Kankavali, Kudal, Malvan, Sawantwadi, Vaibhavwadi and Vengurla. Out of these 8 Tehsils, Devgad, Malvan and Vengurla are the places situated on the coastal line while the others are situated apart from the coast. The famous crops of the district are varieties of rice, coconut, kokam, mango, cashew, jackfruit and all that.

The cuisine of the district is popularly known as Malvani cuisine. Coconut, rice, fish assume prime significance in Malvani cuisine. It is one of the unique cuisine than the rest of the Maharashtra.

There are several places of tourism dispersed all over the district. For the sake of glimpses, one can quote the world famous historical forts like Sindhudurg, Vijaydurg, Ranganagad and some others which have an immense historical significance and also famous for their serene environment. Beautiful and glamorous beaches like Tarkarli, calm and quite temples like Kunakeshwar and a hill station, eco-hotspot in Western Ghat ranges like Amboli, stunning natural waterfalls at various places etc. also add in the list. Due to its natural glory, Tarkarli beach is rightly called as 'Queen beach' of Sindhudurg.

In addition to that, Sindhudurg also has a world fame for its unique quality fruits like Alphanso mangoes, Jackfruits, cashews and all that. It is also a region of very tasty fish and sea food available all around its borders.

## B] OBJECTIVE

1] Selection of some very important tourist places in the district for case studies.

2] Study of the selected tourist places with reference to present status of tourism, scope of its development with local employment, standard of living of local population and sustainable development.

3] Study of the facilities available in the selected places as well as problems faced by tourists coming over there.

4] Data collected will be discussed in reference to sustainable development of tourism and commercial growth of the locality and different similar places in the district.

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## C] MATERIALS AND METHODS

### 1] Study area

The places selected for the study from the overall Sindhudurg district were as follows…

a) Sindhudurg Fort [Malvan]

b) Tarkarli Beach [Malvan]

c) Vijaydurg Fort [Devgad]

d) Kunakeshwar as a Giant place of Pilgrims and known as Konkan Kashi as a religious place.

e) Shiroda beach, associated Salt Pans and Redi Mahaganapati Temple [Vengurle]

### 2] Methodology

a) Visit to the selected study areas after a fixed time interval of fifteen days.

b) The studies were carried out for a period of one year from January 2015 to December 2015.

c) Interviewing tourists from other states in India as well as abroad and from the other places in the district itself with a suitable questionnaire.

d) Interviews of at least 100 tourists were aimed.

e) Photography of the places and interviews with the tourists.

f) Proper presentation of the data with suitable techniques and relevant discussion.

## D] OBSERVATIONS

### 1] Main features of the places selected for study

The places selected for the study have their own unique importance in the overall set up of the district as a tourism district. The overall area of the district has different varieties of tourist places at different localities. But the main localities which are much famous than the others and have commercial significance in day to day life of the local population have been considered here for the studies.

Malvan tehsil is a prime place in the district. It is a small city located on the sea coast with a native population of not more than 30, 000. The main attractions for the tourists over here are the Sindhudurg Fort built by Raja Chhatrapati Shivaji and Tarkarli beach. The natural beauty and historical aura of the fort has been still attracting the tourists from all over Maharashtra as well as other Indian states and abroad. The fort is well known for its architecture and over all skills used by the builders of it. Tarkarli beach has been emerged as a recreation beach in the last decade. It a remote place and has a calm and quiet environment.

Vijaydurg fort is also another place of historical glory and beauty in Devgad tehsil of the district. It was built by Raja Bhoj Shilahar in $11^{th}$ century. It is also a place of scientific history as the Helium gas was discovered overthere on the fort. Every year, the 'Helium day' is celebrated by the local people as well as several outsiders on the respective day of the discovery. This fort is also well known for its unique built up and its position on the sea coast towards the protective and fighting acts of an army. One can easily keep an eye over a very wide range of the sea form the fort.

Kunakeshwar as a Giant place of Pilgrims and known as Konkan Kashi as a religious place. It is a place right on the sea coast in Devgad Tehsil and has a 'Mahadev' temple on the same. The temple has a history of almost 900 years and was rebuilt by a Muslim Sardar 300 years back under some religious faiths. Every year, lakhs of tourists, devotees and pilgrimmers visit the place. It is a village which is commercially better adapted.

Shiroda beach is a very beautiful and mind catching place in Vengurle tehsil which is associated historical Salt Pans and another very famous religious place known as Redi Mahaganapati Temple. The salt pans here have an immense importance in the Indian history because Mahatma Gandhi performed the famous **"Meeth Satyagraha"** at this place only. Besides, Salt pans themselves add in the beauty of Shiroda village. A number of birds and other animals can be observed overthere when the pans are full of water. Redi Mahaganapati is a religious coastal temple on the coast, just like Kunakeshwar, having very deep devotional feelings in the local people as well as other localities in Maharashtra. The temple is regularly visited by several tourists and devotees.

Amboli is a very naturally rich biodiversity Hot-Spot in Sawantwadi Tehsil and on the borders of Kolhapur district [Maharashtra] and Belgaum district [Karnataka]. It is a world famous place known as a better hill station, a place of highest rainfall in Maharashtra and a place of rare, endemic animals and plants.

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**2] Aims and purposes of the tourists from various places coming to these places**

Obviously, the populations coming to these and other tourist places come with different aims and attitudes. Almost 99% of the tourists are coming over here to have a great fun and different types of sea food. They are also interested to enjoy the natural beauty of different regions of the district. On the way of fun, they also try to get some spiritual or devotional inputs from the visits to religious places. All these matters are to be finished within two or three days or maximum four. Some big groups of school or college students come over to perform some studies related to biodiversity and ecology of the region. Besides, pilgrims of different Gods, Godesses and Saints are celebrated throughout the year. For that also, large crowds gather at those places during the dates. In the immigrating crowds, most of the populations are occasionally of local natives who had migrated to other parts of state or country for jobs and businesses. Such native immigrants are more crowded during Ganesh festival, Holy festival and May vacations. Thus the district has a continuous flow of outsiders throughout the year. But majority of the tourists who don't have any physical or emotional relationship with the district mainly come here to snatch a lot of fun that can sustain for at least several months after their return to their homes. Migrants from the district add to fun and food and come to meet their relatives staying over here in the native houses.

**3] Observations**

It has been observed that the tourists coming to visit the different tourist places selected for the study are already under a great theoretical impact about those places which has been read in texts or reference books or on internet. Many of them get much impressed during their actual visits to the places as they have already read all the historical, religious or ecological details of the places. Hence they attempt to search the read matters overthere. In the remains of the forts available inside the still standing peripheral architecture, they attempt to search the footprints of the history that they know. The visitors already have their hearts filled up with the proud and devotions for the history and the personalities who created that. But many of them get frustrated also after watching the remains and the negligence of governments in maintenance and all that. There are no adequate informative boards or offices who could provide better services to the tourists. Even there is a lack of perfect tourist guides who can communicate well fluently in Marathi, Hindi as well as English. Besides, the new generations who do not have much affection for the history or the social matters, are frequently observed performing unethical practices by taking disadvantage of the fort premises. It has been observed that premises of both the forts gets dumped with tons of solid waste of numerous kinds every year. It has bottles, tins, plastic goods and all that. Decaying solid waste like unwanted or excess food, remains of food, fruit peels and all that is also thrown carelessly by many people in and around. That causes decomposition and release of pungent and bad smelling gases in the air causing damage to the air quality in many places. The coastal waters also suffer from the same. Besides, water pollution due to oil sleeks of fishing trawlers and tourist boats has also generated a threat to the life in the coastal shallow waters in Malvan.

After a very big and yearly three days pilgrimage of "Mahashivaratri" hold in last March of 2015 at Kunakeshwar, the local people and some NGOs collected about 37 tons of solid waste from the coastal area which was gathered just in three days period. The religious celebrations are associated with a very big fair of goods and all the fun for all age groups. People from far distances come to enjoy the pilgrim. Besides, local people as well as pilgrimmers also use the coastal rocks as their natural toilets for their day to day natural needs and even pilgrimmers use to bathe in the waters of adjacent sandy shore with a great devotional feel. This worsens the natural status of the place and also produces a threat to the rich biodiversity in and on the coastal rocks overthere. This year the concerned pilgrimage is destined to occur from 6$^{th}$ March to 8$^{th}$ March, 2016. There are such more than 30 big pilgrimages organized at different sacred places in the district.

The same problems are also being faced at the Amboli Hill station. Actually it is a natural habitat of several endemic plant and animal species. But due to severe human interference and consequent serious problems, the place is deteriorating and is becoming notorious. Ill-legal forest destruction and animal hunting, the natural wealth has become endangered. At the same time, increasing human civilization is also adding to the destruction and generating a serious problems to environment over there.

As the number of tourists is getting raised day by day and as the local people are getting good commercial benefits, it is essential to look after these nuisance matters also seriously. Local people are not in a position to look for a cure or better handling of the situation as they are aiming for good money through a tough competition. Number of hotels, bars and permit rooms has also increased significantly in all the tourist places increasing business competitions and related clashes. That has disturbed localities with many socio-ethical, psychological as well as socio-political problems. Rise in alcoholic addictions among much % of local youth is a matter of anxiety for many families. Driving after alcohol intake has been seriously increased leading to

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increase in the number of road accidents and related deaths throughout the district. It has been recently estimated by RTO of the state that the number of youths, in the age of 18-25, dying in road accidents is highest in the Sindhudurg district as compared to other parts of Maharashtra.

Gradually increasing negligence towards social ethics and manners, family responsibilities and a wrong attitude towards education at all levels is also a serious matter to probe into. Besides, lack of self-consciousness and cognizance for the society is found to be decreasing day by day.

Deceiving practices in businesses were also observed to be in use at many places. Especially, tourists from outside places and abroad have to pay larger amounts for small things or enjoyments as they are actually unaware of the facts. The outsiders may be easily deceived in the matters like quality and quantity of the sea food, type of sea food and typical Konkan fruit products and so on. The foreign tourists never use to stay at any place in Sindhudurg because they do not get the required facilities and provision like five star hotels and all that they get in the neighbouring state of Goa. Hence foreigners come here just to visit certain places only, especially beaches, but don't prefer to stay here. Remote places in Sindhudurg like Devgad tehsil rarely experience a foreign tourist as they are away from Goa.

## E] DISCUSSION AND CONCLUSION

After adequate observations and interviewing a variety of tourists from different places and different social status, it could be said that the overall present natural eco-geographical makeup of the district embeds a good potential and scope for the development of tourism along with a positive sustainable maintenance of its natural gifts and properties. But the lacuna in the process need some deep and sincere efforts that need to be carried out at local level as well as administrative and government level.

The main need of time is proper orientation and education of the local people to take proper care of the nature in their surrounding along with developing some eco-friendly tourism schemes and ideas. At few places, such ideas are being experimented by local expertise, educationists involving local people. Example of "Coastal Turtle fairs" should not be forgotten here. Such turtle fairs are attracting all types of tourists including foreigners, generating a better local revenue and mainly local employment and giving a helping hand to poor people in the coastal villages.

Similarly, one more thing that was pointed out is the need of well-educated, better living and good- looking reliable tourist guides. It is a need of time which may attract more flow of tourists and will also produce more per cent of local employment.

At the same time, it is also a need of time to generate awareness about the solid waste dumping and related problems among locals as well as outsiders by all means. Awareness programmes in local villages with a regular follow up by GOs and NGOs as well as educational institutes may be conducted to generate it properly. Display of the proper public awareness boards, flexes and similar practices could be carried out at least to reduce the extent of dumping. Lack of cleanliness and related problems have affected tourism practices as well as health of local populations in some places. Unavailability of right medical services at all times is also a significant lacuna at many places which prevents the tourists to stay overnight overthere.

Development of good roads with informative guiding boards and stones at every required place is also badly needed, especially in some remote tourist places.

It has been also detected that throughout the course of tourism over the district, a very few i.e. almost 5%-8% tourists are only introduced to the local culture and folk arts like Dashavtar and Warali Paintings. If there is a proper planning for presentation of the local culture and folk arts at every place of tourist focus, it will add in the glory of the tourism as well as name and fame of the district itself.

If all these aspects are properly achieved, it is possible that the maximum natural potential of the district for tourism development can be utilized with sustainable maintenance of the natural resources supportive to that.

## G] ACKNOWLEDGEMENTS

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# REFORMS IN TEACHING ENGLISH IN INDIA TODAY: BILINGUAL PERSPECTIVE

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## ABSTRACT
*This paper attempts to make an analysis and overview of code switching in English and Hindi, popularly known as 'Hinglish' paper present the use of Hinglish in India through focusing on special feature of hinglish and how it differs from standard English. It also aims to study certain common means as communication in Hinglish, e.g. advertisement, announcements, instructions, newspapers etc.*

## INTRODUCTION
Bilinguals or multilinguals with no change as interlocufor or topic, refer code switching to the mixing of two or more longuage in discourse. This mixing can be at any level of linguistic structure, i.e, inter-sentential level or intra sentential level. Early linguists treated these structures as deviant but structural approaches found the study of these as rewarding. Mixing of two languages opens up the challenges for formally explaining the the grammar of a new kind of syntax which would have been simpler in case the Linguist is dealing with monolingual structure. English, like all languages, is not static. It is ever changing and adopting new words and style. Global English has led to a crisis of terminology. The distinctions between native speaker, second language speaker and foreign-language user have become blurred English already finds itself in a different mix-now where does it enjoy complete hegemony. The globalsing forces of commerce, technology, Hollywood and Bollywood made the language impure on one hand but interesting on the other. Indian English known as Hinglish has its special characteristic.

## INFLUENCE OF HINDI IN INDIAN ENGLISH
India is a country of a billion people and people spoke different languages here but Hindi and English are designated as the country's national languages. This situation has lead to the spontaneous creation of 'Hinglish', a hybrid language combining elements as Hindi and English. According to Professor David Crystal, Hinglish, spoken by 300 million Indians across the globe, is set to become more popular than English. There is a constant rise in Hindi words and expression used in Indian English. When a mixture of English, Hindi and other languages. Even in pure English, many Indian terms slip in Frequently.

### From English to Hinglish
English, which come as a colonial languages, Found a place in the educational setting even before the independence of the country. The administrative languages at the Formal level remained English, with a few exceptions on the southern States. With the advent of globalization, liberalization and privatization, Indian people Found the great advantage of learning English. The new media culture has deep links with the western counterparts and this has greatly influenced the people in their lifestyle, Food, habits and approaches It become popular after the entry of satellite TV in India. Some popular phrases unshered in the rise of Hinglish by the advertising industry are

(a) Taste Man Naya Twist

(b) Fun ke mood mein

(c) Come on girls, waqt hai shine karne ka!

(d) Life ho to aise

(e) Hungry, Kya ?

Bollywood, the Indian film industry, also plays a big role in the rise of Hinglish. Some popular songs are good examples.

(a) Desi girl

(b) Dating kalre Tu open calendar hai.

(c) Gandhigiri used for Gandhism etc.

### Advertisements in the News Papers
Advertisements in English in Indian Newspapers and sign boards which are almost every where in the streets of Indian towns are even more interesting. Following example with their explanation are

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**(1) Vegetarian available here !**
This was a signboard placed in front of a hotel. It is most likely that the word 'Food' was left ut in the advertisement since advertisement to get a vegetarian person in a hotel doesn't make sense.

**(2) Marry daughters for only rupee 60 !**
If any English man read this advertisement in newspaper it seems outrageous to him but for Indian it simply means that you pay Rs. 60 and the person on the office that has put the advertisement will find a suitable groom for your daughter

**Some Idioms and Phrases**
**Poor Joke (pj)**
Poor Joke is not a commonly used phrase; a more common way as saying same thing is 'bad joke'

**Innocent divorce**
In refers to someone who is force a to divorce with no Fault of his / her own. Both sides probably feel the Fault lies with the other side, so the usage as word 'innocent' may not be understood.

**Give me a ring**
'Give me a call', is a better way of saying the same, when you want someone to call you. It has nothing do with ring.

On the form and Feature as Indian English, Keki N. Daruwala says in his 'Mistress':

You can make her out the way she speaks her consonants bludgeon you; her argot is rococo, her latest 'Slang' is available in clerical dictionaries ----- She will not stick to vindoloo, but talk of roasts, pies and pomFrests grilled. She speaks of contreav and not cashew arrack, which her Father once distilled. No, she is not Anglo-Indian----- she is Indian English, the language that I Use.

(Keki N.Daruwala : The keeper of the Dead)

Kamala Das, another doyen as Indian writing in English also has something to reflect on the Indian is ation of English and related issues:

I am Indian, very brown, born in Malabar; I speak three languages, write in two, and dream in one "Don't write in English," they said, English is not your mother tongue. Why not leave critics, friends, visiting cousins, every one of you and me alone? Why not let me speak in any language I like ? The language I speak become mine, its distortions, its queerness, all mine, mine alone It is human as 9 am human, don't you see ? It voices my Joys, my longings, my hopes, and it is useful to me as cawing is to crow or roaring to the lions

(An Introduction)

**CONCLUSION**
Raja Rao writes in the preface to Kanthapura.:

We are all instinctively bilingual, many of us writing in our own language and in English. We cannot write like the English. We should not. We cannot write only as Indians. We have grown to look at the large world as part of us. Our method of expression therefore had to be dialects, which will someday, prove to be as distinctive and colourful as the irish o the American. Time alone will Justify it.

In India, English has long been the language of the government and the educated elite, and anyone who mixed Hindi and English was jeered at. Now that is changing. Hinglish has become the hep voice of Urban India and is turning into a common tongue. Hindi words are making their entries in English word order of English is changed in Hinglish. To eliminate student's hesistation and make them Feel relaxed, the English language should be used in the Indian context.

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# IMPACT OF DEMONETISATION ON LOCAL JEWELLERS WITH SPECIAL REFERENCE TO NAVI MUMBAI

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**ABSTRACT**
*The Gems and Jewellery sector plays an important role in the Indian economy. One of the fastest growing sectors, the Government of India has declared this sector as a focus area for export promotion. Nevertheless, Bullion and Jewellery sector leads to generation of black money in a larger way.*

*The Government of India on the 8th November 2016 announced demonetization of Rs. 500 and Rs. 1,000 banknotes with effect from the same day's midnight, making these notes invalid. This was initiated as a major step to check undeclared black money, Apart from combating black money, the other reasons stated is also to check fake currency (used to finance terrorism) and corruption. Hopefully, the nation looks it as revolutionary and positive change in the business markets. The impact of Demonetisation has led to various debates and concerns on time to time basis, some temporary and some permanent. In case of Jewellery sector, is is just on cash gold and could be temporary. However, the demonetization decision is a very bold step by the Prime Minister to take India towards legitimacy. The study is an attempt to understand the implications of demonetisation on local jewellers with special reference to Navi Mumbai.*

*Keywords: Gems and Jewellery sector, Demonetization, Black Money.*

## INTRODUCTION

One of the most significant sectors of Indian economy is the Gems and Jewellery sector which contributes around 6-7 per cent of the country's GDP and to the country's Foreign Exchange Earnings (FEEs). It is also the fastest growing sectors, extremely export oriented and labour intensive. Based on its potential for growth and value addition, the Government of India has declared the Gems and Jewellery sector as a focus area for export promotion. There are more than 500,000 players in the gems and jewellery market in India, with the majority being small players both organised and unorganised.

The black money holders invest in bullion and jewellery to protect the value of their black money from inflationary depreciation. Thus, this sector becomes the major participant in the generation of black money.

In a major step to check undeclared black money, on the 8th November 2016, the Government of India under the initiative of Our Prime Minister Shri. Narendra Modi demonetization of Rs 500 and Rs1000 banknotes took place. With the Announcement, these notes became invalid with effect from the same day's midnight.

As a part of Modinomics, 'Demonetization' could become the most effective tool in combating inflation, combat corruption and black money.

Demonetization is the act of stripping a currency unit of its status as legal tender. Demonetization is required whenever there is a change of national currency. The old unit of currency retires and is then replaced with a new currency unit. Demonetization is a generations' memorable experience and is going to be one of the economic events of our time. Its impact is felt by every Indian citizen. However, this move of the Modi led Government has raised various issues and concerns on the impact of demonetisation on the various sectors, society, citizens, foreign exchange, market, economy and the country as a whole.

### Demonetisation and Its Impact

Indian economy depends heavily on cash as only less than 50% of the population uses banking system for monetary transactions. With people struggling for cash to pay for goods and services, demonetisation has likely to take a big toll on the country's growth and output during the current fiscal. A drop in spending resulting in decline of growth has been witnessed as the consumption goes down. This particular move has also lead to behavioural change in households' savings and their consumption pattern.

Let's analyse the **main impacts** in detail.

i. ***Not a big disaster*** like global banking sector crisis of 2007.

ii. ***Liquidity crunch (short term effect)*****:** Liquidity shock means people are not able to get sufficient volume of popular denomination especially Rs.500. Higher the time required to resupply Rs 500 notes, higher will be the duration of the liquidity crunch. This currency crunch has affected the economy at the large.

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iii. ***Welfare loss for the currency using population*:** The daily wage earners, other labourers, small traders etc. who are part of the informal economy uses cash frequently. These segments lost their income in the absence of liquid cash. Cash stringency compelled firms to reduce labour cost and thus, reducing income and purchasing power of the poor working class.

iv. ***Adverse effect on the economy*:** When liquidity shortage strikes, it is consumption that is going to be adversely affected first.

Consumption ↓→ Production ↓→ Employment ↓→ Growth ↓→ Tax revenue ↓

Thus, resulting in decline in income, investment etc. which may reduce India's GDP growth.

v. ***Impact on black money*:** Only a small portion of black money is actually stored in the form of ready and liquid cash. Unlike other forms such as physical assets like gold, land, buildings etc. or even deposits in the banks in foreign countries. Further, the result of demonetisation with the aim of combating black money is quite less than expected. However, the nation has become aware of the issue and perhaps convinced about the need to fight black income. Such a nationwide awareness and urge will encourage government to come out with even strong measures in future too.

**BRIEF REVIEW OF STUDIES**

**Gitanjali Gems Chairman and Managing Director, Mehul Choksi** said that the jewellery industry has welcomed the government's decision to ban old Rs 500 and Rs 1,000 notes. According to him, gold demand will rise as people will have more faith in the precious metal than the currency notes. He mentioned that though demonetisation will create havoc for a little while and the economy will also destablise. But overall, it is going to be good for the country. In fact, the jewellery industry will thrive as people will have more trust on jewellery than currency notes.

**PC Jewellers Managing Director, Balram Garg** stated that there could be short-term impact. He added that this was a very good decision for long term especially for the organised sector. However, there may be some problems for unorganised jewellers. There could be impact on pure gold demand, which is good for jewellers.

**PROBLEM OF STUDY**

The current debate on the term 'Demonetisation' has raised issues regarding its impact on the economy, various sectors, people and the nation as a whole. The study thus, focusses on the effects of demonetisation on local ornament sellers in a big way. The study focuses to study the significant impact of demonetisation on local jewellers with special reference to Navi Mumbai.

**OBJECTIVES OF THE STUDY**

The study proposes to understand

i. The effects of demonetisation on gems and jewellery sector both organised and unorganised.

ii. The significant impact of demonetisation on local jewellers with special reference to Navi Mumbai only.

iii. Positive and Negative implications of demonetisation on local jewellers.

iv. The bottlenecks and problems faced by the jewellers.

v. The behavioural buying pattern of the customers after demonetisation.

**RESEARCH METHODOLOGY**

The study is mainly based on investigating the impact of demonetisation on local jewellers both organised and unorganised. Also, the study is limited to Navi Mumbai only. Thus,

i. It is an exploratory research comprising of Primary and Secondary data.

ii. A questionnaire has been designed to collect the responses from the samples.

iii. Purposive sampling has been initiated to collect primary data.

iv. Sample size is of total 50 local jewellers.

v. Statistical and Analytical method of data interpretation has been used.

**DATA COLLECTION AND DATA ANALYSIS:**

Using the survey method, primary data was obtained from the respondents by administering the questionnaire and evaluating the feedback. Personal interviews were also conducted with few respondents who provided

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valuable information inputs. Secondary Data included information collected from websites, books and articles in various publications and journals.

The survey was conducted to investigate 'The impact of Demonetisation on local jewellers with special reference to Navi Mumbai' which discloses the significant impact on local jewellers, customers, the bottlenecks, the problems faced by jewellers and customers and their grievances.

**FOLLOWING WERE THE OBSERVATIONS**

i. 50% of the total concerns in the area were in business for the last 6 to 10 years. Whereas, only 10% of them were in business more than 15 years.

ii. The majority of the concerns in the area (i.e. 49) trade in all the commodity type of Gold, Silver and Gems. Whereas, only 1 of them were in business with the commodity Gold.

iii. 56% of the total concerns in the area are having customers beyond the Navi Mumbai. Whereas, the remaining 44% have restricted their business to the specified area only.

iv. 25 concerns were having customers beyond the Navi Mumbai to extent of less than 25%. Whereas, the remaining 3 concerns have customers between 26 – 50%.

v. 76% of the total concerns in the area have customers prefering to make payment in cash and 22% of them prefer to pay through both Debit Cards and Credit Cards.

vi. 6% of the total concerns provide their customers the option of making payment only in cash. Whereas, the customers have other options too. 94% of the concern provide in all the forms (Cash, Cheque, Debit Cards/ Credit Cards).

vii. 56% of the total sales of the concerns in the area are received only in cash. Whereas, the remaining 44% are received in all the forms (Cash, Cheque, Debit Cards/ Credit Cards).

viii. All the 50 concerns file Income Tax Return regularly and on time.

ix. 22% of the total concerns had favourable response of Demonetisation on their business. Whereas, 16% of the respondents were not in a position to comment on it.

x. Only 36% of the total concerns in the area had customers who responded positively to the Demonetisation of Currency. Whereas, 50% of them were of the view that Demonetisation was unfavourable.

xi. 80% of the total concerns in the area witnessed increase in the sales after Demonetisation. Though, 16% of them did not witness any change in the sales after the event.

xii. The increasing sales gradually declined over the period of time. For the first 15 days , the sales for 25 concerns increased. But, only 2 of the concerns are still witnessing increased sales till date.

xiii. The major event that took place after Demonetisation was Purchase of jewellery with Old Currency Notes followed by Recycling of Light weight and Wedding jewellery (i.e. 48 % and 32% respectively). However, due to Diwali festive and wedding season though there was demand created which would have resulted in Gold prices risen up.

xiv. 42% of the total concerns in the area agree that Demonetisation would help in bringing out undisclosed black money from the jewellers and the customers. On the other hand, 12% of them strongly disagree with it and opined that it would not be the sufficient mean and the most effective tool to bring out the black money out.

**MAJOR GRIEVANCES OF CUSTOMERS**:

i. Shortage of cash in the system leading to a lot of discomfort for the general public.

ii. The move has also led to a shortage of lower denomination notes such as Rs. 100 and Rs. 50 that are still legal tender.

iii. Gold prices which arouse evenly.

iv. Non acceptance of Old Currency notes.

v. Jewellers happily sold gold at a high premium.

vi. General Public felt victimised.

vii. Purchase of gold irrespect of need or urgency.

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viii. No other option but to buy by hedging for the demand during the wedding season.

**VIEWPOINTS OF THE JEWELLERS**

i. Jewellers believed that the impact of the demonetisation on their businesses was significant, but also showed support to the initiative by saying it was a temporary setback.

ii. The sales of gold dropped more than 90 % and most of the jewellery stores are closed because people don't have the money to buy jewellery.

iii. All gold transactions are now happening either through cheque, credit card or online. But the business has dropped by more than 70 %. Speaking about the long-term impact due to the banning of Rs. 500 and Rs. 1,000 notes, the jewellers felt that 'Gold is going to remain strong.'

iv. This is definitely a hit to the jewellery business but still they appreciate the move by the PM. The decision taken will have a significant impact on the gold sales in the long run.

v. This will organise the order, provide safety for the customers and reduce Hawala transactions, which will in turn condense terrorism.

vi. Looking at this as a very positive move and the local jewellers do not mind barring this little hitch for the betterment of our country's future.

**CONCLUSION**

Prime Minster Narendra Modi's decision to scrap high value notes of Rs. 500 and Rs. 1,000 although created a shortage of cash in the system, leading to a lot of discomfort for the general public and businesses. Also, since there is a shortage of newly printed Rs 500 and Rs 2,000 notes, the situation has worsened. The move has also led to a shortage of lower denomination notes such as Rs 100 and Rs 50 that are still legal tender, as people have taken to conserving whatever cash they have in hand. But, the efforts have been appreciated by the major sectoral experts.

Because many black money hoarders rushed to jewellery shops as soon as demonetisation was announced leading to impulse buying of gold which resulted in the rise of gold prices. Also, back dated transactions were also reported. However, most of the jewellers were busy in happily selling gold at a high premium and even exchanging the old currencies with worth of gold. The Government has asked top jewellers to give details of gold transactions after the demonetisation. The Government has taken extreme note of all these events and happenings and till date. Overall, most of the jewellers are confident that once things streamline, the move will have a significant impact on the gold business in the long-run. Meanwhile, I-T officials conducted raids to check any malpractices after the demonetisation move, following which jewellers immediately stopped selling gold at higher rates.

Demonetisation has slowly but surely started to show its consequences. Apart from people losing patience over exchanging their currencies, several small and medium scale businesses appear to have taken a major hit. The jewellery industry, which had a rapid pace sales resulting out of demonetisation leading prices of gold to arouse evenly. On the outset, it also suffered and saw about 80 % drop in demand following the demonetisation due to increased gold pricing, is slowly recovering. Although it may take some time to become normal.

Post Demonetisation which was also the peak wedding season, it was witnessed that recycling of jewellery (both the light weight and wedding jewellery) went up by three times. This created a cash crunch and stopped currency spending in the market. In the long run, however, this move is encouraging people to use plastic money, online trading, creating more transparency, which is good for the industry. The consumer modus operandi has changed as there has been an increase in the use of plastic money, debit cards/ credit cards for buying jewellery and payment through digital mode. This is actually a good and significant sign for the industry in the long run, demonetisation will benefit the industry, and however, it is likely to take more than a year for things to become normal.

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# STUDY OF BIOACCUMULATION OF TOXIC HEAVY METALS IN THE SILURIFORMES FISH FOUND IN PATALGANGA RIVER AND POSSIBLE HEALTH RISK ASSOCIATED WITH ITS CONSUMPTION

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## ABSTRACT
*Fish, being a protein rich food, is often recommended for consumption by many dieticians. However, the effect of pollution of water reservoirs on the quality of nutrition provided by fish cannot be ignored. It was necessary to focus on toxic substance levels specifically heavy metals which have tendency to bio accumulate. This study investigates the bioaccumulation of heavy metals in the various tissues of Siluriformes fish found in Patalganga River, India. The bioaccumulation often results due to the constant vicinity of fish with the pollutants. Such contaminated fish acts as a pollution indicator of waterbody and also possess life threat to the consumers.*

*In the present study, fish samples are found to contain high concentration of Lead, Iron, Cadmium, Mercury, and Copper. The gills, muscles and skin of fish from segment of Patalganga river were carefully dissected and analyzed for heavy metal concentration by Atomic Absorption Spectroscopy. The study reveals that fish contains high amount of heavy metals such as Fe, Hg and Cu. Especially muscle which are edible part of fish were found to contain heavy load of copper and mercury. The order of bioaccumulation in different organs found was gills > skin > muscle. The result reveals that polluted water bodies are becoming a serious concern not only for the flora and fauna but also for the human beings and thus require regular biomonitoring.*

*Keywords: Bioaccumulation, Heavy Metals, Siluriformes fish, Patalganga River, Toxicity*

## INTRODUCTION
India is endowed with the vast expanse of open fresh water in the form of rivers, canals, natural and manmade reservoirs, lakes, and ponds etc. these are the immense source of freshwater production. These river systems have certain characteristics of their own with respect to their ecology and climatic conditions. These rivers are shelter for large number of living aquatic animals, which are economically important for nature as well as human beings. Fishes found in the rivers are most valuable source of high grade protein and other organic products. Fishes are not only the source of food but they also provide employment opportunity to South Asian population. In recent years, the consumption of fish throughout the world has increased rapidly due to increase in the awareness of its nutritional and therapeutic benefits ( Bawuro et al, 2018, ). Fish consumption is estimated at 30 kg per capita. In addition to being important source of protein, fish are enriched with essential minerals, vitamins, and unsaturated fatty acids (El-Moselhy. 2000). The American Heart Association recommended consumption of fish at least twice per week in order to reach the daily intake of omega-3 fatty acids. As fish is the major component of diet in many countries therefore it is deemed necessary to focus on trace element levels in fish (Zhao S. et al .2012).

Patalganga is the river flowing across huge industrial zone known as Patalganga Industrial Region (PIR). All the treated, semi treated and untreated waste from different sources are released in this river. These pollutants then acts as the source of heavy metals in the waterbody. Fishes normally accumulate these heavy metals from food, water, and sediments of the river. Such contaminated fish acts as a pollution indicator. The presence of toxic heavy metals in fish can invalidate their beneficial effects. Several unfavourable effects of heavy metals to human health have been known for long time. This includes serious threats like renal failure, liver damage, cardiovascular diseases, and even death. Thus, many local and international monitoring programs have been established in order to assess the quality of fish for human consumption and to monitor the health of the aquatic ecosystem. The present investigation indicates the accumulation of heavy metals in the different organs of Siluriformis fish species found in Patalganga River and their hazards to the human health.

## MATERIAL & METHODS
### 1. Sampling site
Study area of the present study is the Patalganga River catchment area which receives effluent load from its nearby industries.. The Latitude of Patalganga River is $18.86^{o}$ N whileits longitude is $73.14^{o}$ E. Patalganga Industrial region (PIR) is an important industrial hub of the state of Maharashtra, in India. The area is home to various industries like chemicals, Insecticides, textiles, Pharmaceuticals, Hydro Power Station, Steel, paper, fertilizer, dye, engineering etc. Resulting into potentially high level discharge of heavy metals.

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**2. Sample analysis**

Total 12 samples were collected from the sampling site and stored under freezing condition at $4^0$C. For analysis, the frozen samples were thawed at room temperature and then dissected for analysis using stainless steel scalpels. The gills, skins and muscles of the fish were dried in an oven at 40°C for two days until they reached to a constant weight. Each dried sample was powdered using a porcelain mortar and pestle. A one gram dry weight of the powdered form of muscle and gill and skin were used for analysis. The samples were digested by adding mixture of conc. nitric acid and perchloric acid in 1:1 ratio. The solutions were heated to obtain a clear solution. After filtration the solution was diluted to 25 mL with double distilled water. Concentrations of Fe, Cu, Pb, Hg and Cd were assayed by using atomic absorption spectroscopy technique. [SHIMADZU, AA-7000]. All the glassware were washed in nitric acid for 15 minutes and rinsed with double distilled water before being used.

**RESULT & DISCUSSION**

The findings of the study show that the fish species under study contained the metal concentration above prescribed limit (FAO/WHO 1984, 1989)

The level of heavy metals accumulated in the organs of fish was found are given in table 1

| Sr.No. | Heavy metals | Mean Concentration in mg/Kg( Dry weight) | | | Maximum prescribed limit (mg/Kg) ( FAO/WHO 1984, 1989) |
|---|---|---|---|---|---|
| | | Gills | Skin | Muscle | |
| 1 | Fe | 265.85 | 174.19 | 177.40 | 100 |
| 2 | Hg | 2.41 | 1.3 | 0.8 | 0.5 |
| 3 | Cu | 66.25 | 25.63 | 45.71 | 20 |
| 4 | Pb | < 0.01 | < 0.01 | 0.075 | 1.5 |
| 5 | Cd | < 0.01 | < 0.01 | < 0.01 | 0.3 |

There were marked variations in the concentrations of heavy metals (Pb, Hg, Cu, Fe, Cd) in gills, skin and muscle of the fish collected from Patalganga river. The study of the fish species revealed that level of pollutants in the water affect the fishes in the respective waterbodies.

The concentration of the metals in the organs were in the order muscle < skin < gills. Gills are pathways of metal ion exchange from water, because gills have very wide surface area that fastens diffusion of metals rapidly. Hence, it is suggested that metals bioaccumulated in gills are basically concentrated from water. Metal concentrations in the fish followed an order: Fe > Cu > Hg > Pb > Cd. This order is in agreement with previous studies [Ghani.et al.2013]

**TOXICOLOGICAL EFFECT**

The muscle is major part consumed by the human population. Hence the muscles of fishes loaded with heavy metal can show deleterious effect on human health. Acute symptoms of copper contamination by ingestion include vomiting, hematemesis (vomiting blood), and gastrointestinal distress (Arwind, 2002). Young children are vulnerable to toxic effects of lead and can suffer profound and permanent health disorders. These effects can be adverse particularly in the development of brain and nervous system. Lead also causes long-term harm in adults, including increased risks of high blood pressure, kidney damage, and neurological effects. Ingestion of any significant amount of cadmium cause immediate poisoning and damage to liver and kidneys. Mercury accumulates in the body and causes neurological disorder that is passed to the later generations. The accumulation of mercury in the body of fishes shows that the river water is highly contaminated with mercury. This could be due to the chemical industries nearby. Mercury is present in the sediments due to the release of effluents from industries and other anthropogenic activities. Like many other trace elements iron level is also essential. The level of iron in the body is tightly regulated, this is done by regulating the rate of absorption. Increased iron level act as pro-oxidant and causes iron poisoning (Chang et al, 2011). Siluriformes are the fish species that live in shallow water and feeds around the nearby sediments. This results in accumulation of high amount of mercury in the fish body, which when consumed by the other fishes and humans causes different health hazards and also affect the food chain. Even the metal present in less amount can get accumulated in human body due to regular consumption of contaminated food and pose danger to health. Copper is a significant trace element necessary for the normal growth and metabolism of living organisms. However, this element may become very dangerous if used beyond its limit, turning into continuous metal compounds with the ability to accumulate in water and cause imbalance to the biological system. (Padrilah, et al.2018)

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## CONCLUSION

In conclusion, the fish sample collected from Patalganga river are contaminated with the toxic metals such as copper, mercury, iron whereas lead and cadmium were in trace amount. The concentration of Hg in the Patalganga river over the prescribed limit is a major cause of concernas it is a carcinogen. Even the low concentration of other metals should not be neglected as the bioaccumulation is time related. Thus, the regular monitoring of heavy metals in fish, help risk assessment study and awareness among the local people is recommended.

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# E-WALLETS - CUSTOMER PERCEPTION

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**ABSTRACT**
*On 8th November 2016 honorable prime minister of India took a phenomenal step by declaring that two highest denomination currency notes in India (500 rupee notes and 1000 rupee notes) will not remain legal tender. Demonetization decision coupled with government's initiative to make India a cashless economy is expected to bring a phenomenal transformation in the way people make payments and expected to increase inclination towards online payment. Among the various modes of online payments the mode gaining popularity during present time is E-wallets. In a nation such as India where larger part of clients still favors Cash-On-Delivery, it is difficult to fasten the pace of process of innovation diffusion such as digital wallets. This generates research interest to study the readiness of people to use E-wallets and factors influencing the adoption of E-wallets including the factors refraining the usage of it, during the post demonetization period. This research paper is aimed at examining the adoption of E-wallets as a mode of payment in Ulhasnagar City and to ascertain the factors encouraging and preventing the usage of E-wallets during the post demonetization period.*

*Keywords: E-wallet, Demonetization, Online Payment, Smart Phone Users, Mode of Payment*

## 1. INTRODUCTION

### *1.1 E-Wallet: A Prologue*

An eWallet, sometimes called a digital wallet, is a secure place that contains one or more currency purses. Your shoppers can fund an eWallet in several different ways. Once funded, shoppers can use eWallets online to buy goods or services. The e-wallet is typically linked to a bank account thus providing an alternative to credit and debit cards. A shopper must register with the provider, and may have to complete a full KYC (Know Your Customer) process before they're allowed to use an eWallet. Some payment service providers have the concept of a verified and unverified eWallet account for users who have completed KYC and those who haven't. Verified shoppers normally have a higher spending limit. Online wallets are replacing credit and debit bank cards at a rapid pace. Applications like Twispay and Twisbox are innovating in this sector, helping users receive money, complete purchases, and pay most of their bills through e-wallets and storing money at minimal to no cost.

### *1.2 E-Wallets in India*

Considering the growing use of online shopping and online payments in India a handful of E-wallet services have been started in India during last few years. Particularly during post demonetization period, the use of E-wallets for online payments is growing at very high rate. As per Reserve Bank of India guideline 'E-wallets' in India can be classified into three categories.

Closed e-wallets: These are wallets issued by an entity for facilitating the purchase of goods and services from it. These instruments do not permit cash withdrawal or redemption. Hence, RBI approval is not required for issuing them.

E.g. Cab services (Like Ola Cabs), e-commerce (like Jabong, First Cry, Flipkart) and mobile companies create e-wallets for making payments towards purchase of products from them /for usage of their services.

Semi-Closed e-wallets: These are wallets which can be used for purchase of goods and services, including financial services at merchant locations/ establishments which have a specific contract with the issuer to accept them. These wallets do not permit cash withdrawal or redemption by the holder.MobiKwik, PayU, PayTM, Citrus, and Airtel Money are the best examples under this category of e-wallet.

Open e-wallets: These are wallets which can be used for purchase of goods and services, including financial services like funds transfer at any card accepting merchant locations [point of sale (POS) terminals] and also permit cash withdrawal at ATMs / Banking Correspondents (BCs). However, cash withdrawal at POS is permitted only upto a limit of Rs.1000/- per day subject to the same conditions as applicable to debit cards (for cash withdrawal at POS).E.g. M-Pesa is an open wallet run by Vodafone in partnership with ICICI Bank. Airtel Money is a semi-open wallet, which allows you to transact with merchants that have a contract with Airtel. You can't withdraw cash or get it back. You'll have to spend what you load.

Table 1 below provides an overview of popular E-wallets in India. These E-wallets are offered number of players across various industries including private entrepreneurs which offers only and only E-wallets and

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nothing else, banking industry players who have come up with E-wallets to fight against the private players, and telecom industry players which have come with E-wallets to leverage on their telecom infrastructure and customer base. Table also provides other details about given E-wallets like Promoter Company, availability of bank transfer facility, availability of facility to send money on mobile, mobile platforms supported by E-wallets and accessibility of Unified Payment Interface(UPI). UPI is a payment system that allows money transfer between any two bank accounts by using a smartphone. It allows a customer to pay directly from a bank account to different merchants both online and offline, without the hassle of typing credit card details, IFSC code or net banking password.

**Table-1: Overview of Popular E-wallets in India**

| E-Wallet | Sector | Company | UPI | Availability Bank Transfer | Send on Mobile | Mobile Platform |
|---|---|---|---|---|---|---|
| Airtel Money | Telecom | Airtel | No | Yes | Yes | Android, iOS |
| Axis Bank Lime | Private | Axis Bank | No | No | No | Android, iOS, Windows Phone |
| BHIM App | Public | National Payments Corporation of India | Yes | Yes | Yes | Android |
| Citrus Pay | Private | Citrus Pay | No | No | Yes | Android, iOS |
| Freecharge | Private | Snapdeal | No | No | No | Android, iOS, Windows Phone |
| HDFC ayZapp | Banking | HDFC Bank | No | No | Yes | Android, iOS |
| ICICI Pockets | Banking | ICICI Bank | Yes | Yes | Yes | Android, iOS |
| ItzCash | Private | ItzCash Card Ltd. | No | Yes | Yes | Android, iOS |
| Mobikwik | Private | One MobiKwiK Systems Pvt.Ltd. | Yes | Yes | Yes | Android, iOS, Windows Phone |
| mRupee | Telecom | Tata Tele Services Ltd. | No | No | Yes | Android, iOS, Windows Phone |
| Oxigen Wallet | Private | Oxigen Services India Pvt. Ltd. | No | Yes | Yes | Android, iOS, Windows Phone |
| Paytm | Private | One97 Communications | No | Yes | Yes | Android, iOS, Windows Phone, Blackberry |
| SBI Buddy | Banking | SBI Bank | No | No | Yes | Android, iOS |
| Vodafone M-Pesa | Telecom | Vodafone | Yes | Yes | Yes | Android, iOS, Windows Phone |
| Jio Money | Telecom | Reliance | No | No | No | Android, iOS, Windows Phone |

*(Source: www.pmjandhanyojana.co.in)*

## 2. REVIEW OF LITERATURE

Many empirical studies have been conducted on the subject of cashless society in India and abroad. The major emphasis of research has been on various issues like frauds, security, usage pattern, new method of e-payment, etc. However, very few literature is available on E-wallets.

Rathore Hem Shweta studied various factors affecting adoption of digital wallet as a mode of payment by consumers and different risk and challenges encountered by users while using digital wallet. The study was conducted by collecting primary data through a structured questionnaire from 132 smart phone users (respondents). Researcher found that main factors contributing towards the adoption of digital wallet as a mode of payment are convenience in making payment online, brand loyalty and usefulness of digital wallet. It was found that users of digital wallet are satisfied with the services provided by them. The most crucial and challenging issues for adoption of digital wallet are security and safety. Shoppers are adopting digital wallets at an incredibly rapid pace, largely due to convenience and ease of use. (Rathore, 2016)

TahemKrunal, Sharma Rahul, Goswami Saurabh (2016)**,** conducted a descriptive study to examine the factors driving use of digital wallets in state of Punjab. The study was conducted during the fourth quarter of 2015 by collecting primary data from 386 (Selected using snowball sampling) users of digital wallets in state of Punjab. The results of this study indicated that People in Punjab have been found using digital wallets due to the motives of controllability & security, societal influence & usefulness and need for performance enhancement. This study

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indicates that folks of Punjab use any variety of digital wallet because of the above mentioned reasons. (Kunal Taheam, 2016)

Kalyani Pawan in his paper studied the awareness and usage of paperless E-Currency transaction like E-Wallet using ICT in the youth of India. The paper elaborately explains features of various E-wallets in India. Researcher found that the most preferred modes of payment among the selected respondents are Cash on Deliver (COD) and credit card and debit card. It was found that respondents have good amount of information about the e-payment and e-wallet services available in India, but they know very little about the same types of services available outside India. Researcher concluded that awareness and practical usability of the E-wallet is low, that should be increased by adding more value added services to it. (Kalyani, 2016)

Sardar Ramesh studied the preference towards mobile wallets among the urban population of Jalagon city of Maharashtra. The study was collected by collecting primary data from 60 users of mobile wallet through a structured questionnaire. The study aimed at examining the awareness and preference towards the usage of Mobile wallets in Jalgaon and to find out the impact of various demographic variables on the usage of mobile wallets. Data was analyzed using chi-square and t-test. It was found that Majority (29%) of the respondents are preferred to use Mobile wallet payment to transfer money followed by recharging mobile or DTH payment and so on. Majority of respondents (90%) believes that an instant payment is an important factor to opt for Mobile payments. Respondents opined that security is the most critical issue while making online payment. (Sardar, 2016)

Shukla Trilok Nath in his research paper "Mobile Wallet: Present and the Future" stated that Based on current developments, it is safe to say that mobile wallets will soon be a self-reliant ubiquitous ecosystem. He stated that mobile wallets will be used in the near future to capture the customer by the digital business marketers. It is also believed that mobile wallets will emerge as new marketing channels as they are providing value added services that go beyond payment. They would become one among the foremost contributors of a seamless shopping experience for the purchasers. Only offering quicker and more-secure payments may not work in the market for long; the industry players will have to provide real time value added services like giving shoppers the convenience to see what's on stored value cards at any moment in time, access loyalty points, or automatically receive digital copies of payment receipts. (Shukla, 2016)

Hee Shin-Dong, in his study "Towards an understanding of the consumer acceptance of mobile wallet" seeks to corroborate a comprehensive model of consumer acceptance in the context of mobile payment. It makes use of the unified theory of acceptance and use of technology (UTAUT) model with is built upon the elements of security, trust, social influence, and self-efficacy. Structural equation modeling is employed to construct a prophetic model of attitudes toward the mobile wallet. While the model confirms the classical role of technology acceptance factors (i.e., perceived usefulness and ease of use are key antecedents to users' attitude), the results also show that users' attitudes and intentions are influenced by perceived security and trust. (Shin, 2009)

In electronic commerce, the challenges of payment transactions were initially underestimated. Business via the internet and mobile telecommunication has so far been dominated by the strategies of payment systems in ancient business. However, in recent times, with the advancement in e-commerce, traditional business models are increasingly coming up against their limits. Electronic wallets are found to be immensely useful for frequent online shoppers are commercially available for pocket, palm-sized, handheld, and desktop PCs. They offer a secure, convenient, and movable tool for online shopping. (Upadhyay, 2012).

Virtual Wallets in near future are for sure going to disrupt both the online and offline business. The Companies that will foster are those which will quickly align their business model and strategies aligning them to the changing trends. It is not a distant day where we will see most of purchase happen either by flashing our mobile cameras scanning against the teller to pay the bills for purchases via Virtual wallets. In Parallel to the implementation of the technology in the mobile application, it is also equally important to educate the customer so that the quicker adoption will increase the user base. (Kalyan Kumar, 2016).

Varsha R and M Thulsiram undertook a study to ascertain the acceptance of E-wallet among the potential users. They found that The price related factor namely 'cost saving' and discount benefits seemed to be low considered by the respondents whereas secured privacy and secured transaction are more primary reasons for e-wallet preference. More than ninety-five percentage of the respondents had a possible apps in the mobile phones for making e-payments (Thulsiram, 2017).

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Indian consumer will use mobile wallet when they are convince by the fact that many relative advantages compare conventional leather wallet. They will use mobile when they are convince that there will be no loss or security concern for using mobile wallet. Intent to use the mobile wallet would increase if the customer trust their service provider and the technology and there by develop confidence on to the system . (Sinha, 2018).

***Gap Analysis***

From the above literature review, it is clear that many researchers have conducted research study on E-Wallets but hardly there are any studies conducted on E-Wallets Benefits and Challenges in the city of Ulhasnagar. Considering the gap, present study is undertaken.

## 3. METHODOLOGY

This research paper is aimed at examining the adoption of E-wallets as a mode of payment in Ulhasnagar City and to ascertain the factors encouraging and discouraging the usage of E-wallets during the post demonetization period.

The study is conducted in the city of Ulhasnagar which is located in the Thane district Situated 58 km from Mumbai. This city is part of Mumbai Metropolitan Region managed by MMRDA. It had an estimated population of 506,098 at the 2011 Census. This 28 square kilometer area has 389,000 people of Sindhi descent, the largest enclave of Sindhis in India. Ulhasnagar is considered as one of the largest denim jeans manufacturer. It has number of small businesses, manufacturing quality denims with an effective cheap labour. Some of the manufacturers export jeans worldwide. The city is also famous for its furniture market, cloth market and electronic market. Apart from jeans, various other industries include textiles, pharmaceuticals, stainless steel, toys, electronics, stationery, paper, BPOs, food and beverages, water distilleries, chocolate manufacturing, confectionery, plastic bags, chemicals, etc. Most of these industries are family managed or partnership based. They carry out their operations from small to medium scale. There are several industrial areas in the city where most of these small units are located. Most of these small industries contribute to the larger extent of income of the city.

Study is based on primary data collected through a structured questionnaire. In total, 200 smart phone users were approached through non-probability convenient sampling method. Findings are presented with the help of charts, graphs and other relevant diagrams. Analysis is made with statistical tools like descriptive statistics.

## 4. OBJECTIVES OF THE STUDY:

The present study is aimed at achieving the following objectives:

1. To understand the concept of E-Wallets
2. To understand the satisfaction level of users using E-Wallets
3. To understand the challenges faced by people while using E-Wallets.

## 5. HYPOTHESIS OF THE STUDY:

H0: Users using E-Wallets in Ulhasnagar are not satisfied

H1: Users using E-Wallets in Ulhasnagar are satisfied

H0: Problems associated with using of E-Wallets are not severe

H1: Problems associated with using of E-Wallets are severe

## 6. FINDINGS, ANALYSIS AND INTERPRETATION

Data for the present study was collected from those users who are using E-Wallets for the purpose of payments. Following section deals with the primary data collected during the course of present study:

**Table-2: Age of the Respondents**

| Age | Responses | Percentage |
|---|---|---|
| 18 to 25 Years | 96 | 48 |
| 26 to 40 Years | 44 | 22 |
| 41 to 50 Years | 38 | 19 |
| Above 51 Years | 22 | 11 |
| Total | 200 | 100 |

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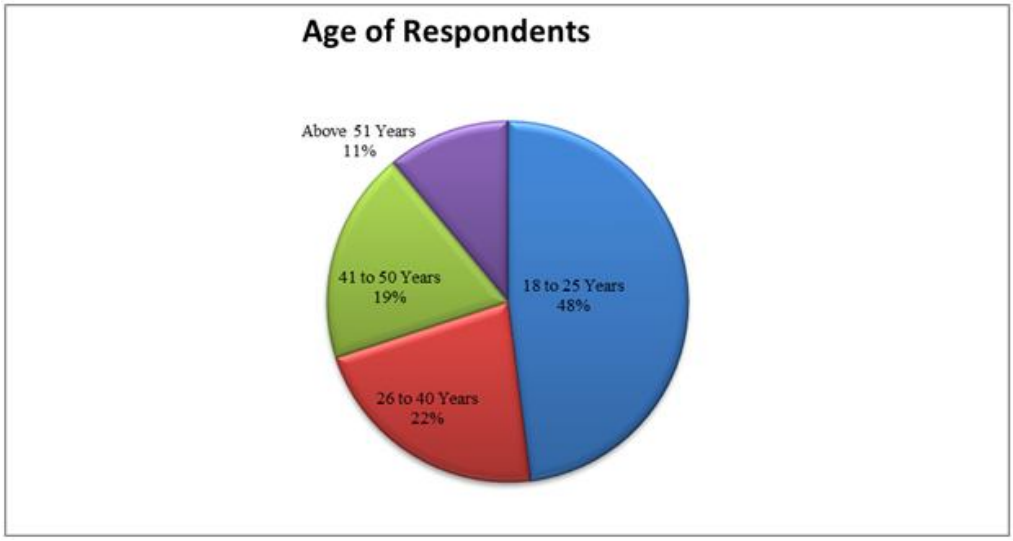
**Graph 1: Age of Respondents**

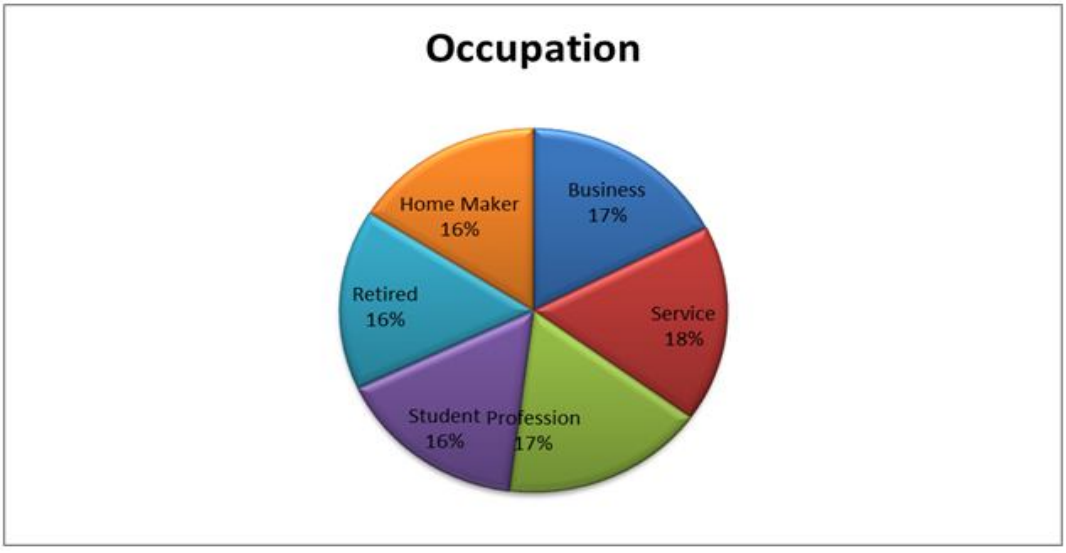



It was observed that 48% respondents belong to age group 18 to 25 years, 22% respondents belong to age group of 26 to 40 years, 19% respondents belong to the age group of 41 to 50 years and 11% respondents belong to the age group of 51 and above years

**Table-3: Occupation of Respondents**

| Occupation | Responses | Percentage |
|---|---|---|
| Business | 35 | 17.5 |
| Service | 35 | 17.5 |
| Profession | 34 | 17 |
| Student | 32 | 16 |
| Retired | 32 | 16 |
| Home Maker | 32 | 16 |
| Total | 200 | 100 |

**Graph-3: Occupation of Respondents**




It was observed while our research that, 17% of our respondents were Business persons, 18% belong to service sector, 17% respondents were Professionals, 16% were students, 16% were retired persons and 16% respondents were Home makers.

**Table-4: Gender of Respondents**

| Gender | Responses | Percentage |
|---|---|---|
| Male | 129 | 64.5 |
| Female | 71 | 35.5 |
| Total | 200 | 100 |

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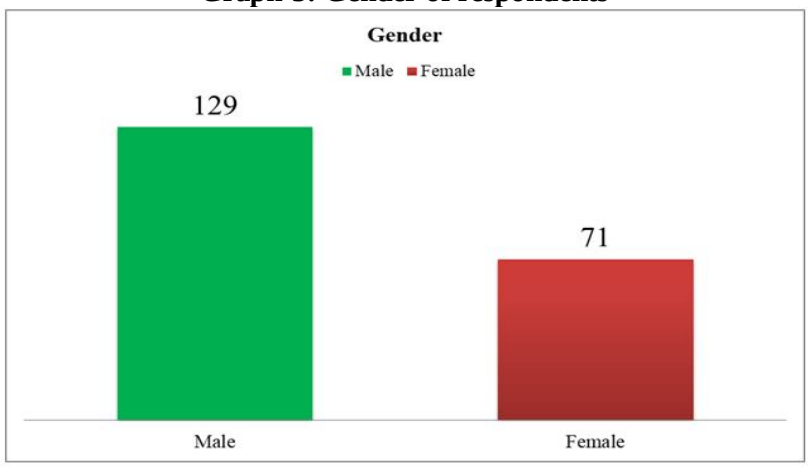
**Graph-3: Gender of respondents**

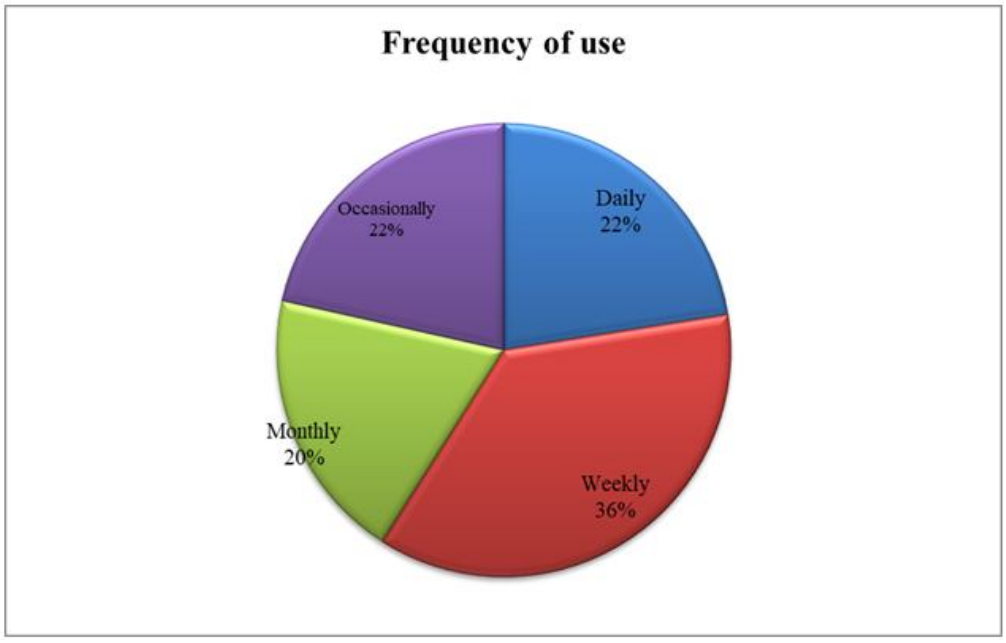



In our present study, 129 out of 200 respondents were Males and 71 responses were from Females.

**Table-5: Frequency of Respondents of using E-Wallets**

| Frequency | Responses | Percentage |
|---|---|---|
| Daily | 45 | 22.5 |
| Weekly | 73 | 36.5 |
| Monthly | 39 | 19.5 |
| Occasionally | 43 | 21.5 |
| Total | 200 | 100 |

**Graph-4: Frequency of Respondents of using E-Wallets**




It was observed that, 22% of respondents use E-Wallets on a daily basis, 36% use them on Weekly basis, 20% of people use them on Monthly Basis and 22% use them Occasionally.

**Table-6: Purpose of using E-Wallet**

| Purpose | Responses | Percentage |
|---|---|---|
| Payment of Bills | 79 | 39.5 |
| Bookings (Hotels, Air, Rail, etc.) | 26 | 13 |
| Mobile Recharge | 29 | 14.5 |
| Online Shopping | 33 | 16.5 |
| Transfer Payments | 19 | 9.5 |
| Others | 14 | 7 |
| Total | 200 | 100 |

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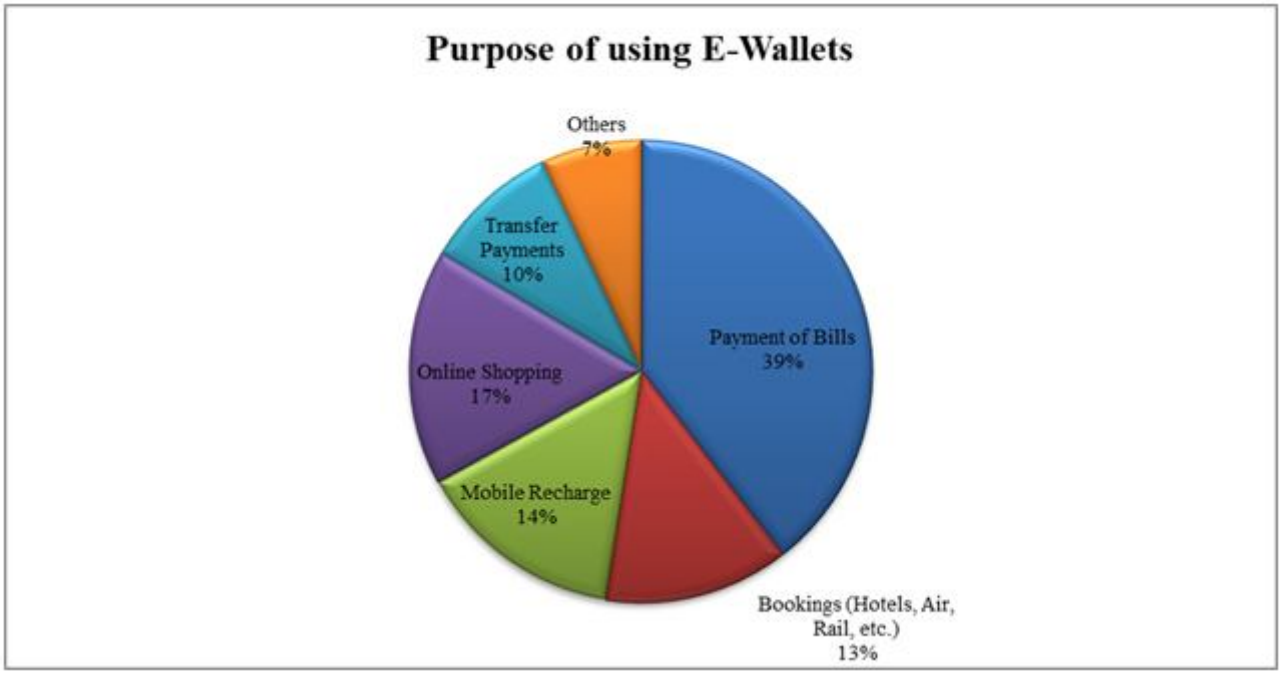
**Graph5: Purpose of using E-Wallet**

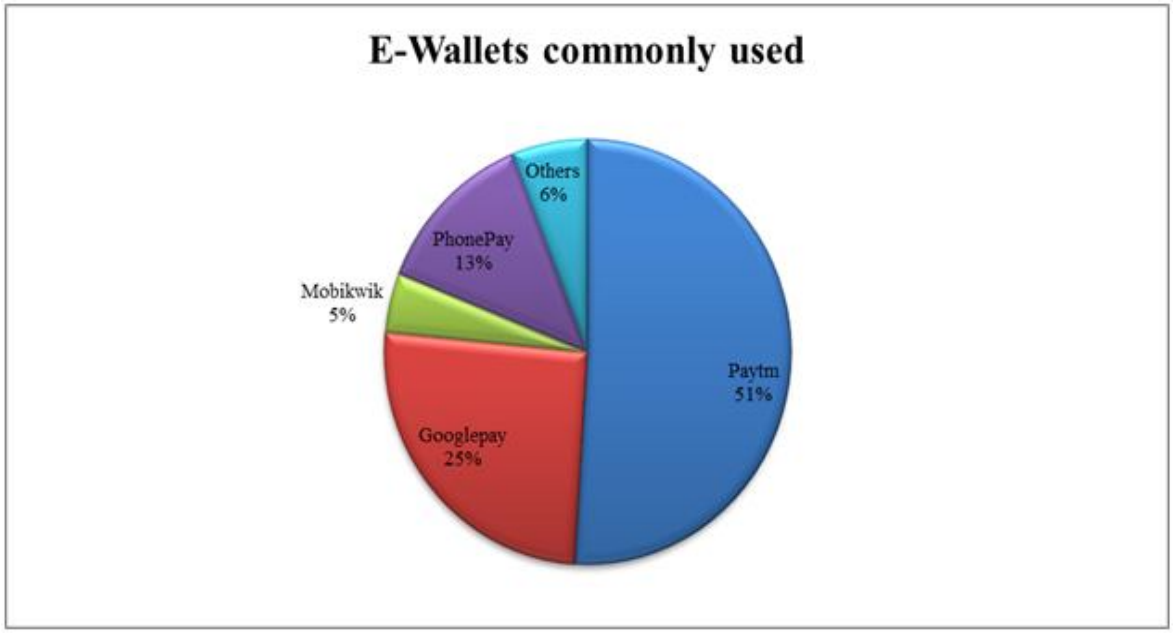



In the present study it was observed that majority people, that is, 39% use E- Wallets for payment of various types of bills, 13% use E-wallets for bookings, 14% people use for Mobile recharges, 17% use it for Online Shopping, 10% use it for Transfer Payments and 7% use it for other purposes

**Table-7: Common E-Wallets used by People**

| E-Wallet | Responses | Percentage |
|---|---|---|
| Paytm | 102 | 51 |
| Googlepay | 51 | 25.5 |
| Mobikwik | 9 | 4.5 |
| PhonePay | 26 | 13 |
| Others | 12 | 6 |
| Total | 200 | 100 |

**Graph-6: Common E-Wallets used by People**




While our research, it is been observed that 51% of people use PayTm for various purposes, GooglePay is used by 25% of respondents, PhonePay is used by 13% of respondents, Mobikwik is used by 5% of people whereas 6% of people use other E-Wallets.

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**Table-8: Understanding the satisfaction level of users with regards to various attributes**

| Sr. No. | Attribute | Satisfaction Level | | | Total |
|---|---|---|---|---|---|
| | | Dissatisfied | Satisfied | Highly Satisfied | |
| 1 | Ease of Use | 20 | 69 | 111 | 200 |
| 2 | Able to make Payments from anywhere, anytime | 16 | 63 | 121 | 200 |
| 3 | Limited Charges | 17 | 76 | 107 | 200 |
| 4 | Discount and Cash back Offers | 26 | 116 | 58 | 200 |
| 5 | Refund of Amount in case of incomplete transaction | 21 | 91 | 88 | 200 |
| 6 | Greater control over daily transactions | 12 | 59 | 129 | 200 |
| 7 | Supported by Most Sellers | 31 | 126 | 43 | 200 |
| 8 | Tracking of Transaction History | 24 | 135 | 41 | 200 |
| 9 | Security | 17 | 90 | 93 | 200 |
| 10 | Its Trending | 7 | 62 | 131 | 200 |

**Graph-7: Understanding the satisfaction level of users with regards to various attributes**


**Table-9: Understanding the problems faced by the People**

| Sr. No. | Problem | Intensity | | |
|---|---|---|---|---|
| | | Least Severe | Severe | Very Severe |
| 1 | Transaction failure | 162 | 23 | 15 |
| 2 | Duplicate Payment | 171 | 19 | 10 |
| 3 | Auto Debit | 178 | 15 | 7 |
| 4 | Security Breach | 181 | 17 | 2 |
| 5 | Delayed Payment | 121 | 66 | 13 |
| 6 | Long Transaction time | 95 | 89 | 16 |

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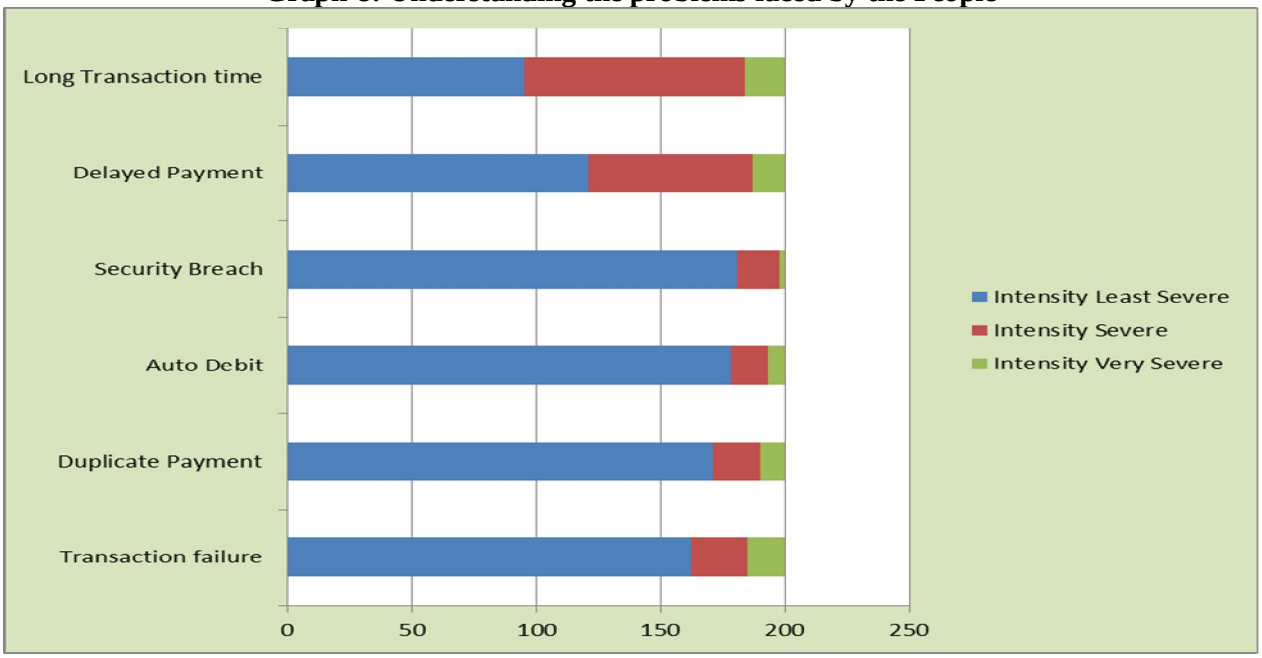
**Graph-8: Understanding the problems faced by the People**




## 7. Interpretation & Hypothesis Testing

**Table-10: Mean Responses of Satisfaction Level**

| Sr. No. | Attribute | Satisfaction Level | | | Total | Mean Responses |
|---|---|---|---|---|---|---|
| | | Dissatisfied | Satisfied | Highly Satisfied | | |
| 1 | Ease of Use | 20 | 69 | 111 | 200 | 2.455 |
| 2 | Able to make Payments from anywhere, anytime | 16 | 63 | 121 | 200 | 2.525 |
| 3 | Limited Charges | 17 | 76 | 107 | 200 | 2.45 |
| 4 | Discount and Cash back Offers | 26 | 116 | 58 | 200 | 2.16 |
| 5 | Refund of Amount in case of incomplete transaction | 21 | 91 | 88 | 200 | 2.335 |
| 6 | Greater control over daily transactions | 12 | 59 | 129 | 200 | 2.585 |
| 7 | Supported by Most Sellers | 31 | 126 | 43 | 200 | 2.06 |
| 8 | Tracking of Transaction History | 24 | 135 | 41 | 200 | 2.085 |
| 9 | Security | 17 | 90 | 93 | 200 | 2.38 |
| 10 | Its Trending | 7 | 62 | 131 | 200 | 2.62 |

As in most of the cases, Mean responses are more than 2, thus ***we reject the null hypothesis and accept the alternate hypothesis***. Therefore, it can be said that the users are satisfied with E-Wallets

**Table-11: Mean Responses of Problems faced by People**

| Sr. No. | Problem | Intensity | | | Total | Mean Responses |
|---|---|---|---|---|---|---|
| | | Least Severe | Severe | Very Severe | | |
| 1 | Transaction failure | 162 | 23 | 15 | 200 | 1.265 |
| 2 | Duplicate Payment | 171 | 19 | 10 | 200 | 1.195 |
| 3 | Auto Debit | 178 | 15 | 7 | 200 | 1.145 |
| 4 | Security Breach | 181 | 17 | 2 | 200 | 1.105 |
| 5 | Delayed Payment | 121 | 66 | 13 | 200 | 1.46 |
| 6 | Long Transaction time | 95 | 89 | 16 | 200 | 1.605 |

As in most of the cases, Mean responses are less than 2, thus ***we accept the null hypothesis and reject the alternate hypothesis.*** Therefore, it can be said that Problems associated with users are least severe.

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## 8. CONCLUSION

Mobile wallet usage awareness as spread among the people in India due to government policy of demonetization and this as forcefully induced the usage of mobile wallet .The security issues are tighten and risk factors are reduced will automatically increase the adoption of mobile wallet. It is analyzed that youngsters are becoming more aware and responsible towards digital payments and are contributing in some or the other way towards growth and success of making India digital. In spite of many security issues, people are inclined towards e-payments because of its convenience, ease of use, quick service and availability.

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# STUDIES ON MAN-MADE THREATS TO THE AVIAN DIVERSITY IN DEVGAD TEHSIL IN SINDHUDURG DISTRICT WITH REFERENCE TO SUSTAINABILITY OF ECOLOGICAL SYSTEMS

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## ABSTRACT
*Relationship of avian fauna with the stability of their natural ecosystems is now a worldwide well-known and well-studied fact. Avian diversity of a region is itself a distinct indicative of health of that ecosystem. Devgad tehsil of Sindhudurg district is also one of such geographical regions where almost 146 different bird species have been recorded in last decade; out of about 255 species overall found in Sindhudurg district. Most of the species of the tehsil are residents of the region but some are migratory and seen in particular seasons only. This diversity is due to varied types of habitats and abundance of natural resources. But at the same time, studies carried out in last 5 years indicate some unfortunate situations for sustenance of this avian diversity due to man-made impact on the ecosystems in the area. The human activities like extensive use of insecticides and pesticides specifically on alphanso mango cultivations are leading to decrease in the populations of small pollinating birds. Similarly cutting of large old trees for various reasons had led to destruction of breeding places for larger birds. At the same time, deforestation has also led to siltation in nearby aquatic bodies like estuaries and fresh water streams. That has led to shallowing of water bodies leading to serious threat to breeding sites of aquatic animals which constitute bulk food of the birds. Hunting of certain birds for food has also generated a serious threat to their population density. Rapidly growing civilization has produced threats for open land birds by causing habitat fragmentation. All such factors have resulted into cognitive reduction in the population density of the avian fauna all over the tehsil. To maintain the avian diversity to cope up with the sustainability and natural health of ecosystems in the tehsil is a need of time. The present studies were carried out during the period of two years from October 2013 to December 2015.*

*Keywords: Devgad, avian diversity, man-made threats, ecosystem sustainability*

## A] INTRODUCTION
Sindhudurg district is well known naturally enriched tourism district on the west coast of Maharashtra. It is located on 16°4' N to 16° 8' N and 73°8' E to 74°E. Devgad is a coastal village in the district. It is located on the Arabian Sea coast. The total **Ecological area** of the **Habitat** available in the district can be divided into terrestrial habitat, fresh water habitat, marine habitat, estuarine habitat including mangrove covers. Due to its diversified habitat structure, food resources are also abundant to flourish a good faunal diversity. Obviously, a very rich avian diversity is observed throughout with specific geographical distribution. Devgad Tehsil and its sea shores are naturally protected from storms and winds due to the hilly parts of Western Ghats encircling to the entire geography of Tehsil. Hence obviously, all biodiversity existing here is naturally protected from any extreme harm of any type of natural disaster.

Bird life in Sindhudurg district represents almost **255** different species distributed throughout the district among **57** families of the group. As per the observations done in last 8 years, the avian diversity in Devgad Tehsil is comprised of **146** species in total. The diversity has been distributed all over in different geographical habitats like cultivations, forests, woods, grasslands, open arid lands, mangrove thickets along estuaries, coastal lines etc.

Though the species diversity in study area is significant, species abundance in most of the cases is significantly less and varying in different parts. Some common birds like crows, bulbuls, kites, egrets and herons have been observed to maintain their populations adequately in all parts. It is possibly due to their greater adaptability towards their feeding habits and tolerance to the human vicinity and consequent interference. But the remaining large bulk of the avian diversity is suffering from ecological constraints on their feeding habits and resources due to their own inherited habits and manmade disturbances.

Thus, the threat of human interference is increasing day to day in all types of habitat. It is now becoming a serious question to be thought of in terms of the sustainable maintenance of the avifaunal diversity as it is directly producing a threat to their survival. Sustainable development in that sense is concerned with the attempts to develop the human areas by conserving natural animal habitats by reserving certain patches of natural habitats and implementing proper conservation techniques which will allow safe feeding and breeding activities of birds. It should also be seen that the existing avifaunal diversity should get gradually habituated and

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adapted to the human vicinity. That will automatically lead to the sustainable management of the other animal as well as plant diversity in the respective areas.

**B] OBJECTIVE**

1] Observations on distribution of avian diversity in different eco-geographical parts of Devgad Tehsil.

2] To analyze the avian biodiversity according to season and the geographical parameters of the habitats selected.

3] To determine threats of human activities towards the alterations in the habitat structures and consequent decline in avifaunal densities.

4] To focus on the need of implementation of certain techniques to attain a sustainable maintenance of the avifaunal populations by conserving their habitat structure.

**C] MATERIAL AND METHOD**

**a] Study area**

The study area selected for the study included a wide range of habitats. But the main representative areas selected were as follows…

1] Agricultural region mostly practiced for Paddy and Barley cultivations only during the rains and winters. The selected area was located just close to Devgad City at a distance of 2-3 km and covered a total peripheral area of almost 12-15 $km^2$.

2] Mangrove thickets of Wadatar-Malai Creek covering a very wide area on both sides of the creek, covering almost a length of 15-18 $km^2$

3] Mango cultivations in Wada and Nadan Villages at a distance of 15km in North of Devgad city. The cultivations are dispersed with wild wood patches as well as rice fields among them.

4] Open arid land plateau of Talebazar and Lingdal villages in the East of Devgad at a distance of 12-18km covering a peripheral area of almost 8-10 $km^2$.

5] Coastal lines of Kunakeshwar, Mithbav and Tambaldeg representing sandy and rocky beaches along with mangrove patches along the estuarine coast of Mithbav creek in South-East of Devgad at distances of 25-30 km

6] Open arid land plateau of Girye-Vijaydurg villages in the North-West of Devgad at a distance of 25 km and covering a peripheral area of almost 5-8 $km^2$.

**b] Methodology**

The methodology followed for the avifaunal study can be put in front step wise as follows….

1] Regular visits to the selected sites at an interval of 8 days and as per the time available.

2] The observations of the birds were done by using capable binoculars of 10 x 35 capacity.

3] Identification of the birds observed has been done by using proper identification keys.

4] Photography was done by using a standard digital camera.

5] During the studies, avian species diversity was given prime importance rather than the relevant population density.

6] Presentation and interpretation of the collected data and relevant discussions have been done by using proper biostatistical tools.

**D] OBSERVATIONS**

1] Overall **146** species of birds were observed during the study period belonging to total **55** families out of total **57** families found all over the district. It constitutes 59.60% of the total avian diversity in the district. Thus it is significantly rich and well distributed all over the tehsil.

**[Table 1.1.3]**

2] Population density of all the species was varying according to the season and the type of habitat in different eco-geographical parts of the Devgad tehsil.

3] Avifauna belonging to 02 families out of total 57 families in the district are not observed in Devgad tehsil but distinctly observed in other parts of the district. Those families are Anatidae and Jacanidae.

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4] The rich avian diversity was detected in all the mangrove ecosystems in the tehsil. They comprised almost **87** species belonging to **38** different families. It is about 59.60% of the total avifaunal diversity in the tehsil.

5] Open arid lands represented very less biodiversity. It showed typical land birds reaching to a number of 23 species only belonging to 7 families. Of them, 18 species were found in other habitats also. Ex.: Black kite [*Milvus migrans*]. But birds belonging to family Alaudidae were observed strictly restricted to open lands only. Thus, it is just 15.75% of all the bird diversity in Devgad tehsil area.

6] All other habitat types represent more or less distribution of all species throughout the tehsil, utilizing even the benefits of human vicinity.

7] Some species were found to be migratory and were seen mostly after the rains till the next rains. But almost 85% of the avifauna is permanent resident of the tehsil.

8] There are certain direct and indirect manmade threats generated to the survival of avifaunal diversity in the tehsil. Those include extensive use of pesticides, gradually increasing human civilizations, deforestation, poaching, road accidents as well as destruction of nests, eggs and young ones knowingly or unknowingly. These threats are apart from the regular natural threats that the birds face to survive.

**E] RESULT AND DISCUSSION**

If the avian diversity in Sindhudurg is concerned in reference to total Indian diversity, then it constitutes 19%. If the same is considered in context to the Maharashtra state, then it comes out to be 44.90% i.e. almost 45% of the total. It is certainly a significant figure; rightly explaining the richness of natural habitats and their diversity. If Devgad tehsil is concerned, it comprises a significant bulk of the avifauna with 146 varieties from 55 different families. It does not mean that it is the maximum or all number of species observed in the tehsil. Some species may have been missed during the study period due to limitations in the observation methods and limitations of the area itself. As Mentioned earlier, it is almost 59.60% of all the diversity in the tehsil.

Of the 55 families, family *Ardeidae* including egrets and herons represents the maximum species diversity with 10 species under it. It was also found to have the most rich species abundance and population density of all. It is followed by the family Muscicapidae with 8 species and family Columbidae with 7 species. Family Cuculidae includes 5 species and stands third in the rank. Nine families as *Alaudidae, Alcenididae, Charadridae, Hirundinidae, Motacillidae, Phasinidae, Picidae, Sturnidae* and *Timallidae* have 4 representatives of each. The remaining 41 families have either 3, 2, or just 1 representative of them. Thus it could be noted easily that there is significant species richness but poor species abundance.

Species belonging to family *Ardeidae* represent abundance more concentrated in the mangrove thickets throughout. Large heronries had been detected among the mangroves of Wadatar-Malai creek and Mithbav creek indicating main dependence of the family members on marine food resources.

Total 87 bird species were observed among the mangroves of Devgad tehsil belonging to 38 families. All those species were found to be interacting with mangroves as well as the regions nearby. Any of the species was observed never 100% dependent for food and other needs on Mangroves but still remains in the premises and interacts with the surrounding.

Secondly, the bird diversity was found to be rich in mixed habitats comprising cultivations, open land patches, grasslands and paddy fields as well as wooded area with dense herbs and shrubs. Such patches were mostly detected near human civilizations. Smaller birds like bulbuls and sunbirds were found to be more concentrated in such areas as they can get diversified food sources and protection from predators near human homes.

Wide open and barren rock lands support a less diversity due to minimum food resources. The food resources available are mostly in the form of grass seeds and insects. Besides, feeding on such habitats is always risky if predation from land as well as aerial predators is concerned. The birds found in such habitats have their body colours perfectly matching to the yellowish soil and black rocky substratum and they are specifically adapted for nesting in the crevices on land. Such birds mostly include larks, finch larks, pipits, Stonechats and lapwings. Larks and pipits usually live in smaller flocks distributed over a large area of habitat. This prevents overexploitation of any food resource at the same time and they can keep themselves alerting each closer flock about the probable dangers in and around. Lapwings are usually in pairs. Two to three pairs may be found at the same place but they are mostly dispersed in few meters area. Stonechats were usually found solitary. All these birds are too much restless, alert and keep on chatting with each other continuously. Except larks and pipits of open land birds, the remaining varieties were found utilizing the resources from other habitats also.

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If natural as well as man made threats to the habitats under study are concerned, there is no any major threat generated by any natural disaster. However, due to heavy storms in other coastal parts of the country and consequent impacts like untimely heavy showers over Sindhudurg, overall ecological health of the natural ecosystems has been found to be adversely affected. It has been also noted that there are no consistent showers during the actual months of monsoon in last few years. That produces a barrier between normal initiation and growth of food chain and food web in such habitats leading to inadequacy of food. Besides, such environmental uncertainties have been observed to disturb the inbuilt circuit of feeding and nesting behavior. It further has been observed to cause physiological and psychological confusions which cause shift in the reproductive programme and untimely nesting behavior in birds. It has been distinctly seen in small birds like Red Vented Bulbul [*Pycnonotus cafer*].

If human activities are concerned, local human interference in the bird habitats in Devgad tehsil has been significantly increased in last few years.

The threats generated by human interference are varied. They include deforestation acts, overuse of pesticides on mango, coconut, cashew and other crops, rapidly increasing human establishments, heavy and long-lasting forest-fires, road accidents, game hunting, destruction of nests, eggs and young ones by predators as well as some human acts and so on.

It has been observed that all such activities mainly cause splitting and dispersal of the bird populations of a specific species or all in a given habitat. It has been specifically detected in case of populations of arid land birds like larks and pipits in the study area. The populations of Oriental Sky Lark [*Alauda gulgula*] and Malabar Crested Lark [*Galerida malabarica*] recorded 10-15 years back were comprising a flock of almost 30-40 birds at minimum or more. Now the flocks of these birds observed in last few years were having just 8-10 birds at maximum. It is mainly due to the human establishments on the open and arid lands causing habitat fragmentation due to plotting, constructions and fencing. This has led to reduction in the amount of food which the birds prefer mostly in the form of grass seeds and insects in and around those lands.

Besides, forest fires have also been detected to cause disturbances in the food chain. Cultivation of commercial as well as ornamental plants in and around the premises of such fragmented lands has also disturbed the natural growth patterns of the wild grasses or complete eradication of those grasses from the area. Natural drying of grasses during winters and subsequent summer is expected so that the seeds of dry grasses could fall down on the ground, get accumulated in the crevices of rocky substrata and get widely spread due to wind to flourish in the next monsoon. But due to increasing housing practices in the selected study area and the green plantations done by the residents, the natural drying process of the wild grasses and shading of their seeds has significantly reduced. Besides, due to fencing of the plots, seed dispersal over a wide area of habitat has been obviously inhibited leading to patching of the grasses in most of such regions. This has ultimately reduced the feeding sources of the arid land birds. That has led to the splits in the open land bird populations and dispersal of the split groups in the adjacent areas or long distance areas.

The other unfortunate human act increasing silently in the coastal parts is deforestation activities in the thickets of mangroves. But undesirable Cutting of mangroves for human welfare is still a poor practice here. But still mangroves are cut down for various purposes. The main purpose is firewood and timber.

One more cruel type of threat generated by humans to the bird life is the road crushing of birds under vehicles, especially their young ones. The birds mostly falling victims to road accidents are Crow pheasant [*Centropus sinensis*], domestic crow [*Corvus splendens*], Jungle Babblers [*Turdoides striata*], Common Myna [*Acridotheres tristis*] , Blue Rock Pigeon [*Columba livia*] and Spotted doves [*Streptopelia chinensis*] etc. Of these birds, the significantly highest frequency of road deaths was seen in Crow Pheasants. It is due to the fact that the bird prefers mostly hopping locomotion on the ground and even a steady and slightly slower flight very close to the ground. It prefers a low height flight and hopping because of its heavy tail as compared to the other body. Hence if a bird is crossing the tar road, it falls easy victim to the speed of vehicles as it cannot escape fast. It has been observed that the young ones of this bird on their first flight out of their nest fall victims most of the times. This can reduce the population density of this bird in natural habitats. Similar is the case for crow and other birds. But the remaining birds can immediately fly as they have a proportionate tail. But still such birds get crushed under vehicles while collecting the food spilled on the road.

Other human activities like game hunting were also observed to be contributing in the decline of the species abundance of the avifauna. Cutting of huge and old trees have considerably contributed to loss of nesting sites of all types of hornbills. Especially, the Common Grey Hornbill [*Ocyceros birostris*] and Malabar Grey Hornbill

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[*Ocyceros griseus*] are now the birds getting gradually under serious threat due to lack of proper breeding places.

Thus, concluding the discussion, it is very clear that if avifaunal diversity of Devgad Tehsil is to be maintained and conserved, then conservation of their habitats as well as food and breeding resources needs to be seriously thought about. Environmental education of common man is also a need of time. Along with the environmental education right from the primary level, it is the ethical duty of every learned man to educate the common uneducated or half educated man about the conservation of biodiversity and sustainable development.

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# RECENT STUDY ON NOISE POLLUTION IN LAST DAY OF GANESH FESTIVAL 2018 IN JUNNAR TALUKA, PUNE DISTRICT OF MAHARASHTRA, INDIA

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## ABSTRACT
*Junnar is a city with thousands of year of history in pune district of the Indian state of Maharashtra. The nearby fort of shivneri is the birth place of Chhatrapati Shivaji Maharaj, the founder of the Maratha Empire and very few kilometers located at two major ashtavinayak temple. Junnar taluka has been declared as the first tourism place in pune district by government of Maharashtra on 9 January 2018.Every year, the number of noise pollution is at record high in the junnar taluka during the last day of ganesh festival.This day, loudspeakers, DJ and traditional instrument like dhol, tashaetc can be played around the hospital, school, and religious temple as in junnar city has added to the rising decibel levels.According to noise pollution rule, the permissible decibel level during the night is 40 db in silence zone and 45 db in residential zone. In September 2018 for last day of ganesh festival moniterised near by 10 major locations in different time. This locations are into silence and residential zone. All the sites under study showed higher sound level than the standard limits given by Central Pollution Control Board.*

*Keywords: Noise Pollution, Ganesh Festival, Junnar Tehsil*

## INTRODUCTION
Noise pollution is generally defined as regular exposure to elevated sound levels that may lead to adverse effects in humans or other living organisms [1]. According to the World Health Organization, sound levels less than 70 dB are not damaging to living organisms, regardless of how long or consistent the exposure is. Exposure for more than 8 hours to constant noise beyond 85 dB may be hazardous.

Various physical disorders due to higher noise include temporary deafness, headache and increase in blood pressure. Rise in cholesterol level causes constriction of blood vessels which increases the priority of heart attacks [2]. Negative effect of exposure to excessive noise during pregnancy period [3].

Junnar which has thousands of years of history, dense forests, forts and cave complexes would be developed as a "tourism-tehsil" of Maharashtra. Nestled in the Sahyadri mountain ranges of the Western Ghats, Junnar, is also famous for its leopard population and wildlife. The teak forests give a unique view of this place. The dams like Manikdoh, Yedgaon on Kukadi river and the Chilewadi on Mandvi river give a unique look to the rich nature. The Khodad village in this tehsil also houses the Giant Metrewave Radio Telescope (GMRT), the largest telescope at metre wavelengths in the world, which attracts radio astronomers from different countries.

The noise levels across the junnar tehsil are on a rises yearly. There are many causes to increase the noise but many of these one of them is last day of ganesh festival during this time I notice that noise level increases 2018 compare to this past year and its more hazard's to human being and junnar nature.

Noise pollution effect on human health, such as Hearing Problems, Cardiovascular Issues, Sleep Disturbances, Mental Health Problems and bring day to day activities to a standstill. Recent studies on impact of low and high intensity sound on marine life showed that aquatic animals like cuttlefish and octopus suffer serious damage from noise pollution. Research has proven that aircraft induced noise is responsible for a significant decrease in reproduction activity in a wide range of animals [5].

In the present paper an attempt has been made to compare the noice levels at important locations of the city with standard limits. Noise monitoring as carried to asses the noise level and to identify different sources of noise in different locations of the city.

## MATERIALS AND METHODS
### Sites of measurements
In September 2018 for last day of ganesh festival moniterised near by 09 major locations were selected for measuring noise levels during this study for different time and distances (like 25m and 50m). These locations are into silence and residential zone. (Including that Hospital's, School's and Religious temples etc).

### Sampling method and duration
The ambient noise level was monitored with the help of sound level meter during evening time (6.00 pm -10.00 pm). Leq noise rating system was used to calculate the noise level as there was higher fluctuation in the ambient noise level during the festive period

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At each selected location, the instrument was operated continuously for measuring period of 15 - 20 min during which several readings of noise were recorded and saved. At the end of this period, the minimum and maximum levels in addition to the mean value were considered as the net results. The last day of ganesh festival duration was selected at different time and distances from 25m to 50m of the different major locations in junnar city. Readings were recorded after 1 min interval of 15 to 20 min at every site during evening time.

Observed noise value were compared with that of the standards prescribed in Environmental Protection Act, 1986 and standards of CPCB (Tripathy, 1999). The Noise Pollution (Regulations & Control) Rules, 2000 has given noise limits for different areas. These limits were used to compare the noise levels in respective areas under study [6].

| Code | Area | Day Time | Night Time |
|---|---|---|---|
| A | Industrial Area | 75 | 70 |
| B | Commercial Area | 65 | 55 |
| C | Residential Area | 55 | 45 |
| D | Silence Zone | 50 | 40 |

**OBSERVATIONS**

| Sr.No | Place | Time (pm) | Distance 25m | | | Distance 50m | | | Limit Value in db |
|---|---|---|---|---|---|---|---|---|---|
| | | | Maximum Value db | Minimum Value db | Mean value db | Maximum Value db | Minimum Value db | Mean Value db | |
| 1 | Shankarpura Peth | 06:00 - 06.20 | 113 | 98 | 105.5 | 88 | 74 | 81 | 40 |
| 2 | Pardeshpura Peth | 06:50 - 07:05 | 109 | 98 | 103.5 | 85 | 69 | 77 | 40 |
| 3 | Ravivar Peth | 06:25 - 06:45 | 112 | 94 | 103.0 | 87 | 74 | 80.5 | 45 |
| 4 | Sarai Peth | 07:10 - 07:25 | 116 | 99 | 107.5 | 82 | 72 | 77 | 45 |
| 5 | Telibudhawar Peth | 07:35 - 07:55 | 107 | 90 | 98.5 | 86 | 73 | 79.5 | 40 |
| 6 | Telibhudhawar Chowk | 08:05 - 08:20 | 108 | 98 | 103.0 | 90 | 75 | 82.5 | 40 |
| 7 | Kalyan Peth | 08:30 - 08:55 | 106 | 94 | 50.0 | 82 | 68 | 75 | 45 |
| 8 | Sadabazar (South) | 09:10 - 09:30 | 110 | 97 | 103.5 | 89 | 77 | 83 | 40 |
| 9 | Sadabazar (North) | 09:40 - 10:00 | 109 | 96 | 102.5 | 93 | 78 | 85.5 | 45 |
| | | | Mean Value of all locations | | 103.0 | Mean Value of all locations | | 80.11 | |

**Chart-I: 25m Distance**

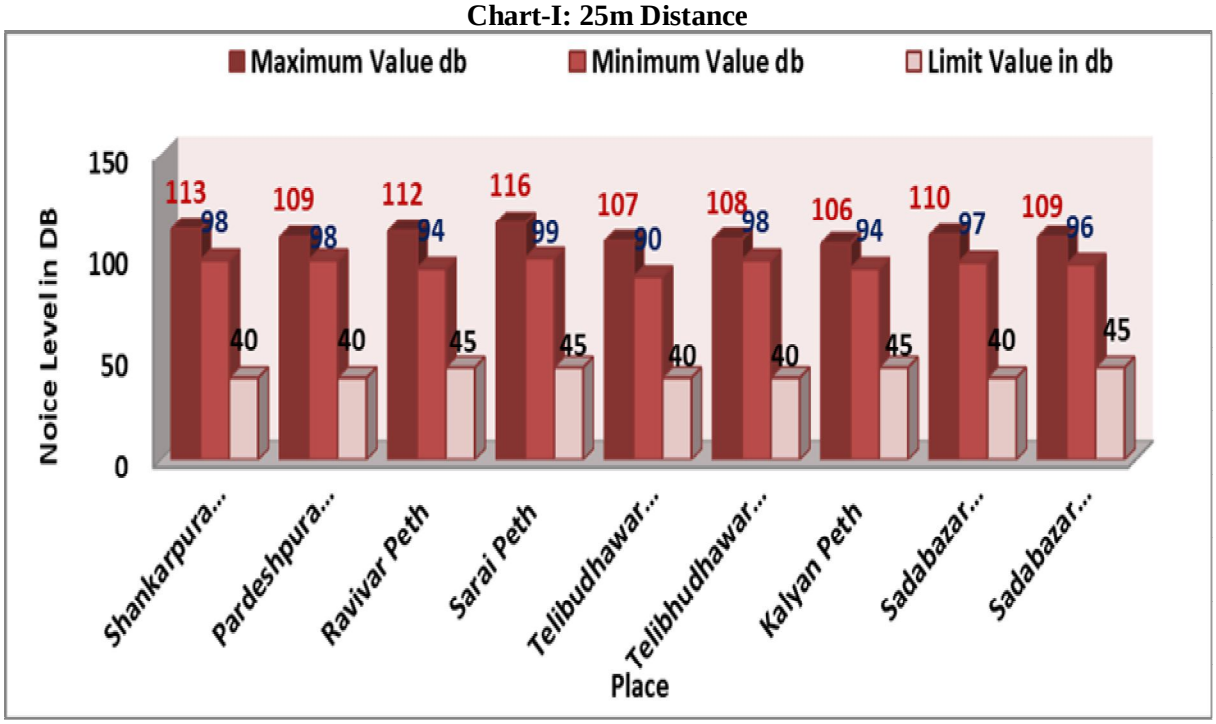

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**Chart-II: 50m Distance**

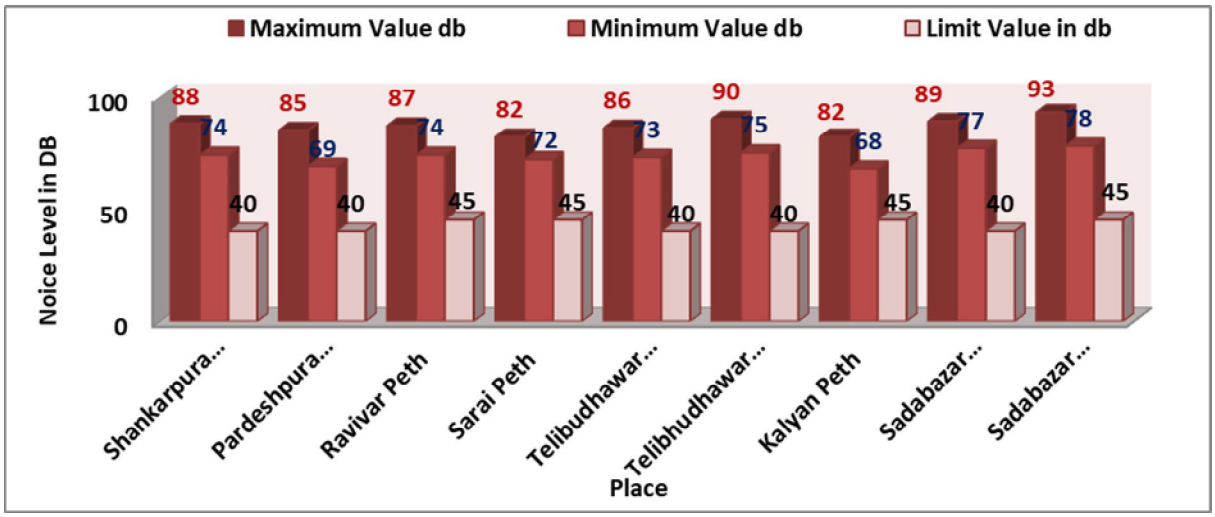
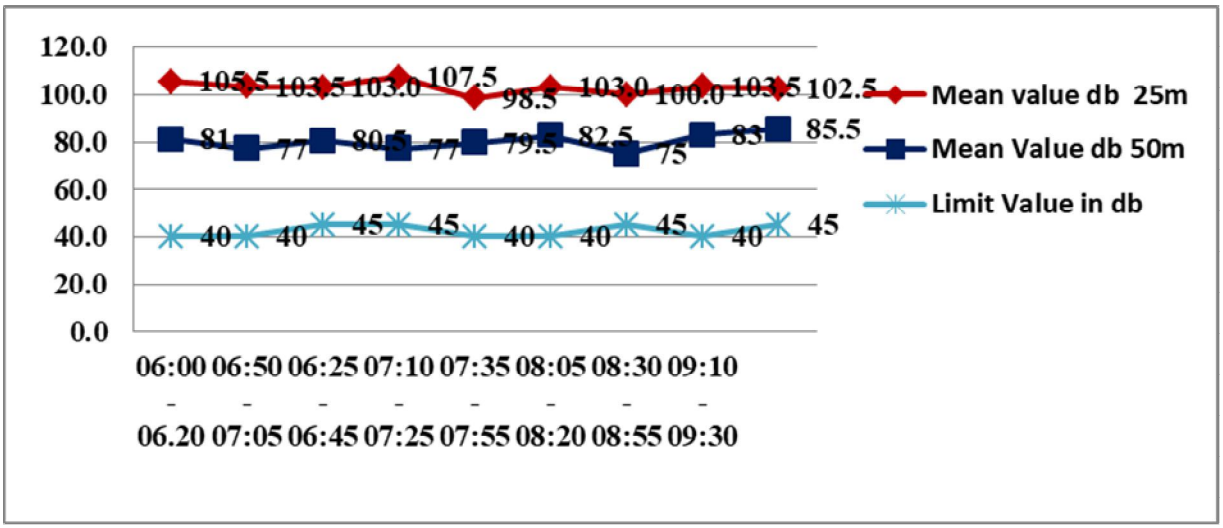



**Chart-III: Time vs Noise level**




## RESULT

The noise pollution levels in Junnar about 9 major locations, it has been observed that Sadabazar (North and South), Shankarpura and Telibhudhawar chowk leads as the noisiest area in junnar city in the last day of ganesh festival. Most of the areas observed decibel levels higher than the permitted limit.

According to the report, while the prescribed night time noise limit for silence areas is 40 decibel (dB), and residential areas is 45 decibel (dB), the recorded level of noise in such areas has approx. two times greater than prescribed limit.

## DISCUSSION

In the present study the average noise level at all locations was found to be above the prescribed limits of CPCB during the last day of ganesh festival September 2018. The noise level showed a significant variation at different location which higher than standard limit. average noise during the night time at a distance 25m was 103 db and distance 50m was 80db which is higher than the standard limits of noise in residential zone and silence zone, respectively.

The reason is that, the last day of ganesh festival loudspeakers, DJ and traditional instrument like dhol, tasha etc can be played around the hospital, school, residential and religious temple as in junnar city has added to the rising decibel levels. The present study is attempt to access the level of noise pollution during last day ganesh festival. There is need of increase awareness of among people.

## CONCLUSION

This research study is based on the expected relationship between standard noise limit and observed value from this survey and findings it is evident that festival noise can affect the human work efficiency at Government Offices, Banks, educational institute and Commercial Business etc. Avoiding this problem requires the right selection of instrument will be used in this festival to minimize the level of noise.

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# EFFECT OF FoMo ON YOUTH

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## 1.0 ABSTRACT

*The term FOMO abbreviated for "fear of missing out" which is a worried feeling that you may miss exciting events that other people are going to, especially caused by things you see on social media, as quoted by Cambridge university. These days because of the ease at accessing the social networking sites, the constant need is been felt to stay connected and keep updated. This is increased so much that many a times people mostly millennials forget to enjoy the present but are concerned towards gathering likes, comments and swipes. Everything for them becomes surreal. The smile that a friend may get while meeting his / her old friend is momentarily lost in the rush of clicking the perfect selfie to post on internet. This constant hunger of posting everything online and checking other people's whereabouts has resulted in the new-found psychological concept. The research paper aims at understanding various reasons and outcomes of FOMO and analyse the impact of the same on the individuals. The research is aimed at throwing light on the concept of FOMO and how it can be examined at an early stage. This will then help everybody to control the consequences and prevent the psychological disturbances in self and relationships. Research Methodology adopted for the paper is Stratified Random Sampling which gave 107 samples. The forms were distributed and data collected was analyzed with the help of Data Tabulation. The inference is then drawn with the help of series of questions falling in various criteria like, Likert scale, dichotomous and descriptive.*

*2.0 Keywords: FoMo, Social Media*

## 3.0 OBJECTIVE OF THE RESEARCH

The objective of the research is to understand the concept of FoMo and its effect on the youth. The research primarily aims at the youth as they are the ones with maximum screen time on their respective smart phones. It is also to understand the drivers for FoMo so that recovery measures can be taken and the psychological state can be corrected to the maximum extent possible. The research only deals with developing the psychological well being of an individual.

## 4.0 INTRODUCTION - FOMO

FoMo as the word read out loud as 'Fear of Missing Out' has its origin deeply rooted in early 2004. Then it was just a start which got its popularity in mid 2011 where then FoMo was no more a general term. Learned speakers have also spoken about FoMo on various platforms but still a lot remains hidden. As it deals with the branch of Psychology the knowledge of it like an ocean, one must dig deeper to find the pearl hidden in it. With the advent of social networking sites, the term got its gravity and earlier which was just a term took the shape of psychological disorder. As it started with only being fear of missing out, it slowly took the shape of regret, guilt and in some cases even helplessness of not being in constant touch with the virtual world. This was also done at the cost of ignoring the real world. Fear Of Missing Out (FOMO) is the uneasy and sometimes all-consuming feeling that you're missing out—that your social groups are involved into, in the know about or in possession of more or something better than you. It is turning out to be social worry which was initially a social envy that's always existed, but it's going into overdrive thanks to real-time digital updates and to our constant companion, the smartphone. Here smartphone not only prove to be the reason but also the major drivers to FoMo. Once social media makes people aware of things to which they otherwise might never have been privy, it can spark a sense of vicarious participation or motivate real-world behaviour. Conversely, it can be a curse, fostering anxiety and feelings of inadequacy. Teens and young adults are most susceptible to and cognizant of FOMO, but they're not necessarily trying to mitigate it. They will be particularly receptive to messaging and strategies that tap into FOMO and will welcome solutions, even when they didn't know they needed them. Conversely, FOMO can be quite paralyzing—people can become caught up in their fears, unable to decide just what they should be doing at any given moment. And FOMO sufferers are often so distracted from the here and now that they fail to fully experience the moment and appreciate whatever it offers.

## 5.0 RESEARCH METHODOLOGY

Methodology adopted for the research includes sampling, preparation of questionnaire, data collection and tabulation to analyze the data. Researcher prepared a questionnaire (with a Likert Scale, Semantic Differential, Dichotomous) comprising of close ended questions on major note and a subjective question to understand what efforts the respondents can take to ensure no effect on them. The method of sampling was stratified random sampling for 120 respondents.

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## 6.0 DATA ANALYSIS

Out of 120 respondents, 107 surveys were valid. Remaining 13 surveys were not properly filled and cannot be considered for analysis. The analysis is done on the following main categories:

1. Perception of FoMo
2. Acceptance of FoMo
3. Possible solutions to prevent or method to Deal with FoMo

## 7.0 INFERENCE

**Table-1: the maximum screen time of respondents in a day**

| Time spent on Smart phones | No. | |
|---|---|---|
| 1.5 hours to 3 hours | 35 | From the table alongside it is clear that a total of 76 respondents use their smart phone for a period of 1 hour to more than 3 hours. It itself profoundly dictates the dependency on smartphones. |
| 1 hour to 1.5 hours | 25 | |
| 45minutes - 1 hour | 19 | |
| More than 3 hours | 16 | |
| 30 minutes - 45 minutes | 9 | |
| 15 minutes - 30 minutes | 2 | |
| less than 15 minutes | 1 | |
| **Total no of Respondents** | **107** | |

**Table-2: Awareness and Acceptance of FoMo**

| Symptoms towards FoMo | Yes | No | |
|---|---|---|---|
| Digital Detox | 54 | 53 | From the table, it is clear that even if 54 respondents accepted to go for digital detox only a few of 19 respondents accepted about they being a part of FoMo. Also an alarming number of 67 respondents access social account as Habit which is a major driver of FoMo. |
| Access to Social account as Habit | 67 | 40 | |
| Awareness about FoMo | 65 | 42 | |
| Acceptance of FoMo | 19 | 88 | |

| Inference Point towards Acceptability of FoMo: | A: Always | O: Occasionally | S: Sometimes | R: Rarely | N: Never |
|---|---|---|---|---|---|
| Started phone watched the social networking sites and forgot for what was the phone opened in the first place. | *6* | *20* | *43* | 21 | 17 |
| | **69** respondents accept the vulnerability and shift of attention over a social networking site. | | | | |
| Importance of Posting Photos on Social Networking Sites | *7* | *23* | *28* | 16 | 33 |
| | **58** respondents accept and hence accept the fake world in the place of real world. | | | | |
| Taking snapshots of friend's status | *32* | *8* | *21* | 23 | 23 |
| | **61** Respondents accept the nonsensical activity to be a part of their screen time on their smart phones. | | | | |
| Association of Happiness with the event depends upon the people hitting 'like', 'love' or watching pics on any platform of Social connectivity | *36* | *26* | *18* | 13 | 14 |
| | **80** Respondents accepted to be dependent on the consent of others for their happiness. A phenomenon termed as social acceptability. | | | | |
| Random like to posts that don't mean anything in reality | *25* | *28* | *31* | 11 | 12 |
| | **84** respondents accept of living in virtual reality and believing in the farcical world. | | | | |
| Addiction towards social networking platforms | *22* | *24* | *36* | 21 | 4 |
| | **82** respondents agreed on spending more than required time on Social Networking time and hence sacrificing the productive time. | | | | |
| Random Profile check with no purpose at all | *14* | *19* | *32* | 15 | 27 |
| | **65** respondents agreed upon checking random profile without any purpose. | | | | |

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| Drivers of FoMo | Sum of Strongly agree and Agree *(No. of Respondents)* |
|---|---|
| I often check my friend's profile or their feeds in order to understand about their daily life. | 34 |
| I click snapshot of my friend's status or feeds. | 55 |
| I only make friends or stay connected with people whom I know personally. | 12 |
| I opened an account on any platform only if my favourite actor / actresses is a part of it. | 80 |
| I am only on the social networking platform to tell people about myself and my whereabouts. | 55 |
| I get upset when my friends or the celebrity shares happy images on the platform with their respective family or friends. | 76 |
| I like to connect to as many as possible and so I add celebrities and random people to my list even if I don't know them personally. | 76 |
| I get irritated when my friend doesn't check or like my feeds on the social networking platform. | 100 |

## 8.0 CONCLUSION

The research paper can sum up to following conclusionary remarks:

1. Digital Detox: Many Respondents agreed upon a digital detox where they suggested monthly detox of 3 to 4 days. To start with it can be 1 day and then gradually increased to 3 to 4 days.
2. Living in the Present: Embracing the real and letting go the Reel life. Understanding how vague and superficial the entire world is on social networking platforms will help youth bring back to the present.
3. Stay Self Motivated: Respondents were of the opinion that if we are self-motivated we might not feel the need to be envious on other person's achievement and this will in turn reduce the angst and weakness left that results in helplessness towards checking social networking platforms.
4. Recognise that it is based on a lie: The fantastic life you think you might be missing out on doesn't really exist. Think about it. When was the last time one of your friends uploaded photos of themselves at the dentist, cutting their toenails, etc. Social media is designed to show us the highlights of each other's lives, like a nostalgic clip show focusing on the best bits while skipping all of the boring episodes.
5. Schedule in some screen-free time each day, ideally involving some face-to-face interaction with Friends – you'll be surprised how quickly you make friends when you don't have the option to look at a screen

## 9.0 LIMITATION AND FUTURE DIRECTIONS

The paper is intended to study the effect of FoMo. The paper mainly focuses on only one psychological aspect of FoMo. So the findings are limited to that. Moreover time and resources to study the components of Fear of Missing Out were inadequate.

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# IMPACT OF SEWAGE POLLUTION ON THE STRUCTURE OF KALAMB CREEK ECOSYSTEM IN VASAI REGION AND ITS BIODIVERSITY

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**ABSTRACT**
*Sewage pollution is one of the major problems faced by most cities today. Rapid urbanization and industrialization in Vasai city of Mumbai with improper environmental planning has resulted in discharge of sewage and industrial wastes into the Vasai Creek; thereby greatly affecting its biodiversity. Water of Kalamb Creek further flows towards Kalamb and Rajodi beaches of Vasai- Nalasopara belt and is an important source of fish-farming, bivalve farming and many other purposes such as salt pans, agriculture, etc. The creek is surrounded by mangroves approximately 5km from the beach. Because of recently developed illegal constructions at Kalamb village like resorts, cottages, over interference of outsider public, tourists, picnic spots, man-made pollution, public sewage, floods and excessive raining etc., the shore as well as water of Kalamb creek is polluted and these pollutants are carried by water waves which causes eutrophication in the creek. This show that the water quality is deteriorating due to heavy discharge of partially treated waste water and sewage from point and non-point sources. Also, biodiversity in Kalamb creek has been threatened in large amount. The present study is on impact of sewage pollution on Kalamb Creek ecosystem for the two consecutive assessment years from 2017-2019. It is observed that, high level of sewage pollution has not only created threat to the aquatic and avian life of the creek, but also affect the aesthetic beauty of the creek.*

*Keywords: Kalamb, Vasai, Mangroves, Molluscan diversity, Avifauna*

## A] INTRODUCTION

In today's world, sewage water pollution is one of the major problems faced by most cities. This kind of pollution leads to health-related and environmental issues. The main reason behind water getting polluted is improper handling of waste water. Sewage is drained off in large quantities to rivers and creeks. It slows down the process of dilution of constituents of water and results in stagnantity. Effluents present in sewage water contain innumerable pathogens and harmful chemicals. Detergents released in water contain phosphates and they allow the growth of algae and water hyacinths. Degradation of the quality of water due to eutrophication leads to reduction in number of water bodies and increase in BOD (Biological Oxygen Demand). With the proper treatment of water, it is possible to reduce water pollution.

Vasai -Virar city is situated at the latitude N $19^0$47' and longitude E $72^0$ 8'. It has an area of 298.08 sq.km and an average elevation of 11 above mean sea level. This city is located in Palghar district of Maharashtra state. It is nested in the tranquil laps of Konkan region with Arabian sea in West and Konkan low hills in East. City has reach population of mangroves with larger patches of salt pans. It is blessed with beautiful biodiversity with rich cultural diversity.

## B] MATERIAL AND METHOD

### a) Study area

It is found that no work has been conducted and published on impact of sewage pollution on biodiversity of Kalamb Creek at Vasai region. Previously, Kalamb beach was an isolated beach located at Nalasopara west near Nirmal village of Vasai- Virar region. But due to popularity in resort constructions, cottages, picnic spots etc beach is now well-known for outsider visitors which have also shown a result of human interference on its diversity. The creek is surrounded by diversity of mangroves with most dominant species *Avicennia marina*, with some other common species viz *A. alba* and *A. officianalis*, also avian and molluscan diversity is observed during study period. The creek is divided by a road for transportation to the local village area. The left side of creek flows towards Rajodi beach whereas right side of creek flows towards Kalamb beach. The area is well-known as Kalamb village, as it is connected to Nirmal gaon with very short distance and creek flows towards the outskirts of a town.

Previously during 2016, the study area with habitats such as marshes, mangroves, tidal flood plains, rocky shore allures sustains rich biodiversity. The wetland provides a great biodiversity value to these kinds of habitat. But recently, after flooding at Vasai- Virar region in 2018, due to anthropogenic activities and unplanned sewage treatment, the habitat structure has affected so as its biodiversity too. Mangroves are a group of trees, shrubs or ground fern found in the tropical and subtropical intertidal regions. They are important ecologically because

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they act as a buffer between the land and sea, protecting land from erosion. Thus, the present study was carried to demonstrate the anthropogenic role in the destruction of the ecosystem in the selected study area.

**b) Materials and Methods**

The selected sites were visited at a regular interval of 15 days for two consecutive years January 2017 to February 2019. The observations of the birds, molluscs and bivalve species were done by using capable binoculars of 10 x 35 capacity. Photography was done by using a digital camera of Nikon cool pix type with 14 megapixel capacity and also Canon EOS 700D with zoom lenses. The observations were made mainly during the early mornings (6.00am to 10.30am), afternoon (12.00 pm to 3.00pm) and in the evenings (4.00pm to 7.30pm). Standard identification keys were used for proper identification and analysis.

**c) Observations and Results**

The continuous study and observations had led to record of avian and molluscs species in studied creek area and was observed that the species richness has significantly declined due to the impact of eutrophication since couple of years. Total 38 bird species belonging to 19 families had been recorded during 2016-2017. The most commonly sighted birds during study time were egrets, cormorants, pond heron, Asian palm swift and Black kite. The appropriate climatic and habitat conditions in Kalamb creek are very much suitable for these species. Large number of migratory birds visit the creek area in different seasons. The most common amongst them were found to be painted storks which migrate to this area for feeding and nesting purpose. They were observed from August to January. They were also found to share colonies with cormorants, egrets, openbill storks etc. Very recently in 2018, severe flood conditions appeared due to improper waste management in Vasai- Virar region. It has led to decline in the number of migratory avian species with only 15 species belonging to 22 families. Before the floods, total 30 species of molluscs from 20 different families were observed in the study area. Of the recorded species, gastropods were found to form the major class with about 60% of the population whereas 40% were bivalves. Four species of cephalopods were also recorded. Species like *Katelysia opima, Sepia officinalis, Arca granosa, Cardium asiaticum, Conus mutabilis, Dosinia sps, Nerita sps, Littorina scabra, Olivia sps, Trochus sps , Umbonium vestiarium , Siliqua radiata* were very common whereas *Loligo vulgaris, Telescopium telescopium , Turbo bruneus, Octopus herdmani* were rarely found. At present, ecological conditions of creek do not support high density of molluscs. After floods, no. of molluscs species have declined to 15 with 12 families.

Availability of food and climatic conditions in Kalamb creek, especially during monsoon when the water gets overflooded on the land, many monsoon migratory birds are spotted as the habitat shows biodiversity richness. Common kingfisher and White throated Kingfisher were spotted in all seasons in the study area. Nestings of Cormorants, jungle crow and house crow were also spotted throughout the year in every season. Further, excessive eutrophication has also taken place in the creek area from October to February 2018.

**D] DISCUSSIONS**

Due to extensive increase in population, urbanized societies in Vasai region are facing problems due to improper waste management. On the daily basis, the effluents generated from domestic and industrial activities constitute the main cause of pollution of the concerned water bodies. It generates a greater burden on the water quality management. A variety of substances kept untreated or improperly treated are known to be toxic to plants and animals (Akpor et al., 2011).

It was also observed that eutrophication of the reservoirs caused due to the sewage pollution has resulted in the gradual decrease in the count of avian and molluscs species. Ammonia essence is distinctly felt while passing by the connecting service road. The main cause of eutrophication is the domestic sewage containing a variety of pollutants ranging from biological wastes, microplastic particles to soaps and fats. Agricultural waste water was found to be containing different chemicals like salts, pesticides and fertilizers etc. Nutrient - rich materials from fertilizers; especially nitrogen and phosphorus cause eutrophication in both fresh and marine ecosystem. Algal blooms occur due to excess nutrients which decrease light transmission in the water. That generates a negative impact on planktons and other aquatic plants. It further leads to reduction in the amount of oxygen in the water. As the algae die in the course of succession, decomposing bacteria consume even more of the dissolved oxygen. Thus, in extreme cases, loss of oxygen results in large dead zones in the water body.

Thus, there is a need of an hour to monitor the treatment of sewage water in order to maintain avian and molluscs species in Kalamb creek area and also to maintain harmony as well as ecological chain in the ecosystem. This can be done with the help of sustainable management techniques.

One of the best means of treating sewage water is restoration of wetlands. As the Kalamb creek area is surrounded by wetlands, it may allow to process the sewage water naturally, without using any artificial

technique. It is postulated that, restoring wetlands would dilute nitrates and phosphates with the help of bacteria present in it and hence can prevent eutrophication. The goal of sustainable management should not only to restore the natural resources but also to make proper use of it. Thus, it is the duty of every common man to maintain the avifaunal diversity by maintaining the bird habitats. For conserving avian fauna and molluscan diversity and attaining sustainable development, human activities with positive humane attitude are badly needed. It can be achieved only by environmental education of common man by arranging programs like bird watching and diversity studies in the field. Thus, three E's need to be applied - Encourage, Educate and Empower among local people in order to maintain sustainable management. Field trips, excursions, action research projects etc. should be arranged by local schools and colleges in order to understand the sensitivity of an area. It is important because all the choices we pursue and all the actions that we make today will affect everything in the future.

## CONCLUSION

The Bassein area supports rich avian biodiversity. The diversity in this area is very much influenced by anthropogenic activities in the surrounding area which are of great concern considering the future existence of these species. Large number of migratory and residing birds recorded, are indicative of good breeding and feeding conditions in locality. A large number of winter and local migratory birds also visit this area during winter season (December to February). By considering these facts, the birds are the biomonitors of healthy and diversified condition of the area there is a need for awareness in coastal community as Vasai is surrounded by coastal region ;towards conservation of such diverse avifauna and its importance with respect to coastal ecosystem. Sewage water treatment is useful in today's world where environmental issues are of prime concern. Through the process of treatment, efforts need to be taken to purify effluents. It should benefit not only human beings but also the varied flora and fauna of our planet. Let's pledge to keep our environment clean and harmful effects of sewage pollution at bay.

## ACKNOWLEDGEMENT

Authors are thankful to Dr. Salim Ali, who pioneered Ornithology and related studies in India and created ornithological interests among millions of hearts till date. Special thanks to my lovely students Master Natesh Santosh, who captured beautiful photographs of birds and Master Prathmesh Pethe to accompany during the visit and making the visit of bird watching program through joyful learning.

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**OBSERVATION TABLE**

**Table no-1: comparative data of avian and mollusks species in Kalamb Creek during study period before eutrophication.**

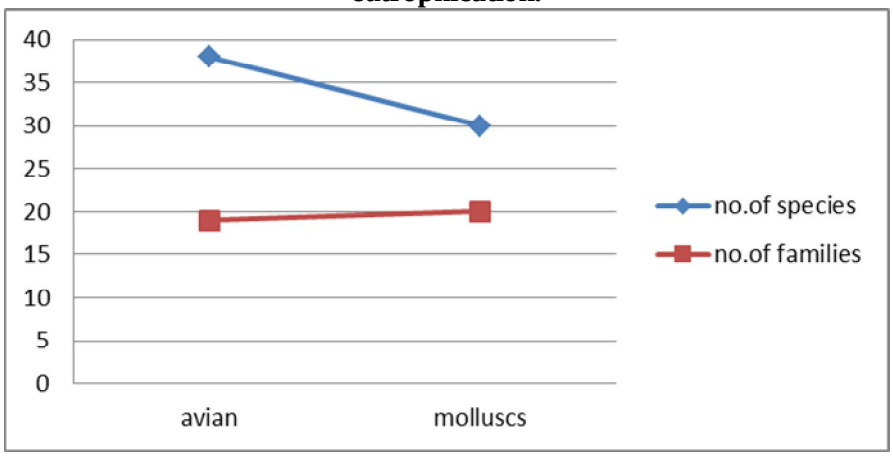
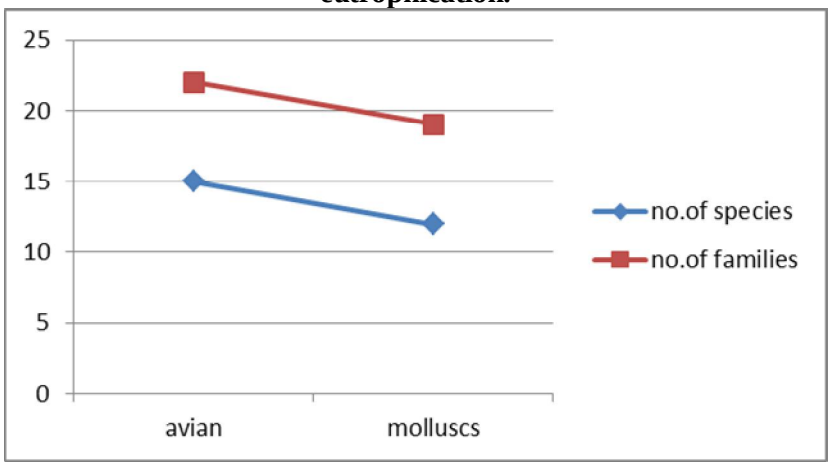



**Table no-2: comparative data of avian and mollusks species in kalamb creek during study period after eutrophication.**



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# STUDIES ON AVIFAUNAL DIVERSITY IN SUNCITY AREA OF VASAI REGION IN PALGHAR DISTRICT WITH REFERENCE TO SUSTAINABLE AVIAN MANAGEMENT

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## ABSTRACT
*Vasai is a historical suburban town north of Mumbai in Palghar district. Suncity area is located in Vasai [West] having connectivity to Nalasopara and Virar area. That area consists partial to swampy low lying and ill drained areas with feathery grass and reeds and the vicinity of wet paddy cultivation. There is also a large dumping ground area where frequent scavengers were seen. Previously, around 15 years ago, there were huge salt pan practices carried out. But due to unavoidable civilization, there have been many constructions at visceral area which has affected the actual habitat zone. Birds have immense ecological value as they serve as bio-indicators for the quality of habitat. They are very sensitive to any slight changes occurring in the ecosystem. A large number of birds were seen in the study area, depending and nurturing themselves directly as well as indirectly with the support of ecosystem. Especially, feeding needs of many birds were found to be satisfied in this area. The present study has been based on regular observations and identification of the species within one year from January 2015 to January 2016. Around 38 species of birds from 19 families were recorded from the study area. They included a variety of small birds, resident birds, migratory birds and wading birds. A comparative study of birds reveals that there are similar minor but well- marked and readily recognizable differences in size, coloration and other details in those species which range over a wide area and live under diversified natural conditions. But due to rise in the human interference by various means, monitoring of the species diversity has become very essential to maintain the sustainability. It is an urgent need of time to take some steps towards the care and conservation of the concerned ecosystem.*

*Keywords: Suncity, ecosystem, avifauna, sustainable management*

## A] INTRODUCTION
According to 2011 census, Vasai- Virar is the fifth largest city in Maharashtra. Vasai is a historical suburban town north of Mumbai in Palghar district. The overall zoogeography of the district supports and flourishes a very rich biodiversity. It habours a large biodiversity of animals due to its naturally rich habitat complex and a rich complex of food chains. Suncity area is located in Vasai [West] having connectivity to Nalasopara and Virar area. That area consists partial to swampy low lying and ill drained areas with feathery grass and reeds and the vicinity of wet paddy cultivation. There is also a large dumping ground area where frequent scavengers were seen. Previously, around 15 years ago, there were huge salt pan practices carried out. But due to unavoidable civilization, there have been many constructions at visceral area which has affected the actual habitat zone. But still there is an open land where mixed kind of habitat is found and large number of birds (Feathered biped) are seen depending and nurturing themselves directly as well as indirectly with the support of this ecosystem. Especially, feeding needs of many birds were found to be satisfied in this area. Since decade, this area has started lot of human interference due to constructions and shortest route for transportation between Vasai, Nalasopara and Virar area. Also, very recently VVMC (Vasai-Virar Municipal Corporation) has set up public garden, play ground, hotels, temple and fire-brigade office etc. on both the sides of the vicinity of Sun-city area. Around 30 complexes are set up in the vicinity of this area, which shows a rapid growth of migrated population. It is important to note that considerable population resides in the vicinity of this area. Birds have immense ecological value as they serve as bio-indicators for the quality of habitat. Thus, it was observed through study, that, number of species are getting decreased day by day. They are very sensitive to any slight changes occurring in the ecosystem. Also, birds are migrated as per seasonal variations is concerned. According to different observations, a total of 143 aves species belonging to 45 families (resident and migratory) were recorded during 9 years of study (Nitin *et al*; 2013) in Bassien. Many birds use this habitat for daily foraging as well as for roosting while some make use of them just for roosting. Some species are also found to use them just as timely resting places during their daily activities. The present study is the first attempt to compile a document of avian diversity in the Sun-city area of Vasai.

## B] OBJECTIVE
1] Observations on distribution of avian diversity in the study area

2] Identification of species with the help of standard proper identification keys

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3] To focus on the need of implementation of certain techniques to attain a sustainable maintenance of the avifaunal populations by conserving their habitat structure.

## C] MATERIAL AND METHOD

### A] STUDY AREA

For the proposed study of avifauna, Suncity locality from Vasai (west) area was selected. It is approximately, 5 km away from Vasai railway station. Interesting factor to note here is that there is no any wide mudflat throughout. Mud bases are very thin and present in scanty patches and hence becomes a good feeding ground for many birds though it has sandy bottoms. During rainy season, the entire area is filled by water and sometimes it get spell on the roadside area. There is a long road which divides the area into east and west direction and show connectivity towards Nalasopara and Virar area. At the entrance of this locality, there is sewage drainage system, where cormorants, egrets and crane resides in group which also shows that, birds might have build their nest on the ground or inside the water. This locality is measured to be approximately, 145 hectares land area with connectivity to Chulna gaon at Vasai, Bhuigaon at Nalasopara and Agashi gaon at Virar. This is the shortest route to be followed by regular transporters and public. It is to be noted that, during study time (early morning and evening) many residents from this locality are engaged in regular activities like walking, jogging, exercise, cycling, bird watching etc. Thus, this area flourishes a very large aquatic biodiversity, related terrestrial diversity and consequently a rich diversity of avifauna.

### B] METHODOLOGY

The selected sites were visited at a regular interval of 15 days. The observations of the birds were done by using capable binoculars of 10 x 35 capacity. Photography was done by using a digital camera. The observations were made mainly during the early mornings (6.00am to 10.30am), afternoon (12.00 pm to 3.00pm) and in the evenings (4.00pm to 7.30pm). Bird watching and recording of species were carried out during the period of two years from January 2015 to February 2017. Proper identification was made by using standard identification keys.

### C] RESULTS

The birds are ecologically versatile organisms. They can successfully survive in all kinds of habitats. Birds are one of the best bio-indicators of environmental quality of ecosystem. Overall 143 species of birds have been detected in Palghar district. Of them, **38 species** from **19 families** have been reported in Suncity locality of Vasai area. Also, few nest were recorded during the visit. It was found that, among 19 families, Ardeidae family contributed highest percentage of bird species with 26% followed by families- *Accipitridae, Alcenididae* and *Threskiornithidae* with 9%. Further, families – *Ciconodae, Corvidae, Pycnonotidae, Estrildinae* and *Apodidae* contribute 6% of bird species and least percentage with 3% was recorded for families - *Columbidae, Cuculidae, Dicruridae, Phalacrocoracidae, Sturnidae, Passaridae, Psittacidae, Sylviidae , Phoenicopteridae, and Motacillidae* .

Depending upon the mode of occurrence, it was found that **25%** of bird species were belong to **uncommon** status and **75%** belong to **common** status with respect to bird families [Table no. 2].

Different types of species were found in the study area throughout the year depending upon the mode of occurrence-resident birds were found throughout the year, WM-winter migratory birds species were found during winter season and MM-monsoon migratory was found during Monsoon. From the recorded data, it was found that **62%** of bird species are **resident**, **28%** bird species are **winter migrant**, **5%** of bird species are **monsoon migrant** and **5%** as **local migrant** altogether.

### D] OBSERVATIONS AND DISCUSSIONS

The continuous study and observations have led to record 35 bird species belonging to 16 families as check listed in Table no 1. The most commonly sighted birds during study time was egrets, cormorants, pond heron, Asian palm swift and Black kite. The appropriate climatic and habitat conditions in suncity is very much suitable for these species. Eagle were rarely spotted as there is also a large dumping ground area including dead and decay animals. Red whiskered bulbul was the most commonly spotted bird. Some other species of bulbul viz. red vented bulbul were also spotted. Large number of migratory birds visits the creek area in different seasons. The most common amongst them were painted stroke which migrate to this area for feeding and nesting purpose and seen from August to January. They were also found to share colonies with cormorants, egrets, openbill storks etc. Cattle egrets are more common as they are mostly seen with grazing cattle, stalking energetically alongside the animals, running in and out between their legs or riding upon their backs, and lunging out to seize insects disturbed by their movements amongst the grass. Black kite were common and are easily spotted in this area. Some rare species like Grey heron, Purple heron, were also spotted in the study area

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showing local migration. Availability of food and climatic conditions being similar to Vasai creek especially during monsoon when the water gets filled over the land. Thus many monsoon migratory birds are spotted as the habitat shows biodiversity richness. Common kingfisher, White breasted/throated kingfisher were spotted in all seasons in the study area. Nesting of Cormorants, jungle crow, house crow was spotted in every season. Some uncommon and winter migratory birds were also spotted in the study area. A comparative study of birds reveals that there are similar minor but well- marked and readily recognizable differences in size, coloration and other details in those species which range over a wide area and live under diversified natural conditions.

It was also observed that, due to human interference, there is gradual decrease in the count of species where scavengers are seen throughout year as there is a large dumping ground. Thus, there is a need of an hour to monitor the bird species in order to maintain harmony as well as ecological chain in an ecosystem. This can be done with the help of sustainable management. The goal of sustainable management should not only to develop the natural resources but also to make proper use of it. Thus, it is our duty to maintain the avifaunal diversity by not to disturb the habitat of bird species. For conserving avian fauna diversity and attaining sustainable development positive human activities having a humane approach towards the natural resources would be credible. It can be done by arranging bird watching program among local people and guiding them about the importance of diversity in area. Three E's can be applied - Encourage, Educate, and Empower among local people in order to maintain sustainable management. Field trips, excursions, action research projects etc. should be arranged by local schools and colleges in order to understand the sensitivity of an area. It is important because all the choices we pursue and all the actions that we make today will affect everything in the future.

## E] CONCLUSION

The Bassein area supports rich avian biodiversity. The diversity in this area is very much influenced by anthropogenic activities in the surrounding area which are of great concern considering the future existence of these species. Large number of migratory and residing birds recorded, are indicative of good breeding and feeding conditions in suncity locality. A large number of winter and local migratory birds also visit this area during winter season (December to February). By considering these facts, the birds are the biomonitors of healthy and diversified condition of the area there is a need for awareness in coastal community as Vasai is surrounded by coastal region ;towards conservation of such diverse avifauna and its importance with respect to coastal ecosystem.

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**G] GRAPHICAL REPRESENTATION**:

**Fig-1: Pie-diagram showing status of occurrence of Avian diversity in Suncity locality of Vasai region**

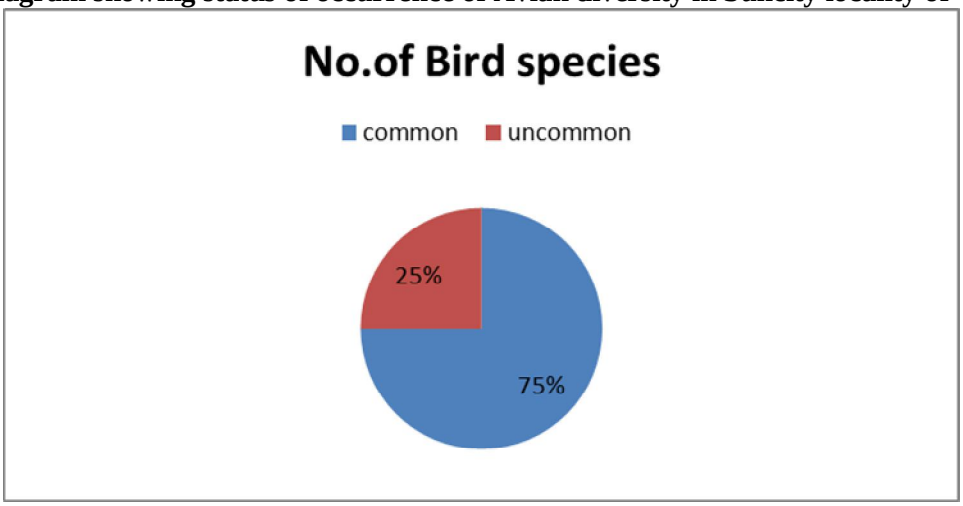
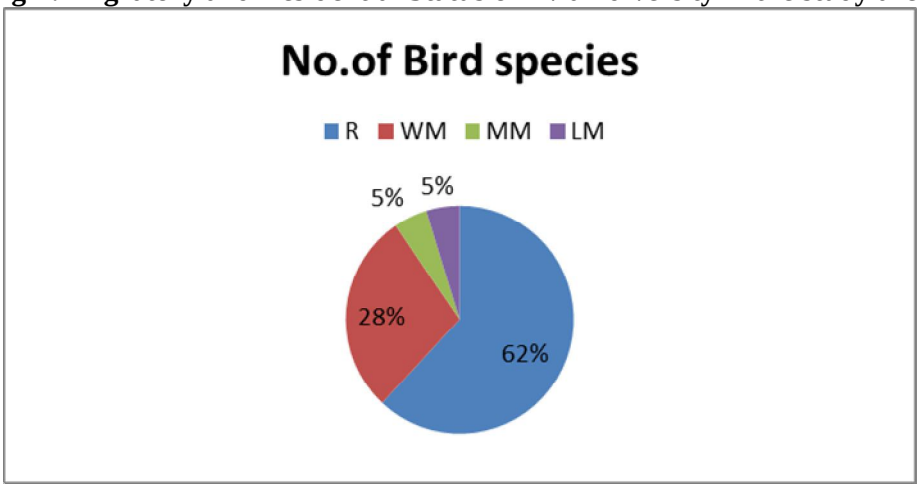



**Fig-2: Migratory and Residential Status of Avian diversity in the study area**




WM- Winter Migratory, R- Residential, LM- Local Migratory, MM- Monsoon Migratory

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# ANALYSIS OF PHYSICAL AND CHEMICAL PARAMETERS IN GROUND WATER USED FOR DRINKING AROUND SHIVALE AND NEAR VILLAGES

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JSM's SGAS & GPC College, Shivale, Murbad

**ABSTRACT**
*The research paper attempts to analyze a water samples of nearby villages of Murbad in terms of the community who consume water for drinking purpose, it raises a question whether it is pure for drinkable or not and a bitter truth comes in the light from the perspective of Government health hospitals of Murbad that a rate of malignantdiseases occurred due to drinkingwater, community suffer from Kidney stone, Jaundice, Diarrhea are found commonly among students. For this research study we collected around 15 water samples from different villages near Shivale College. Collected samples were analyzed for physicochemical parameters including total alkalinity, Temperature, pH, Electrical Conductivity, Total dissolved solids, Turbidity, Alkalinity, Total hardness and Total suspended solid. The obtained results were compared with some national and international standards or guidelines for Potable drinking water. Accordingly, the results obtained shows that most of the collected water samples are found within a potable drinking water range but two water samples results are found in higher variation as compared to potable drinking water levels so it founds unsuitable for drinking purpose. It also addresses the water related diseases and it will be boon for the community in vicinity of Murbad and neighboring villages.*

*Keywords: Water diseases; sampling of ground water; physicochemical parameters.*

## 1. INTRODUCTION

Water is one of the most important and most precious natural resources. The earth holds approximately $1.4 \times 10^9$ cubic kilometers of water, but only 3% of the total available water resources are in the form of fresh water found in rivers, lakes, and groundwater

Groundwater is an important water resource in rural areas of Murbad. Rural dwellers rely basically on hand-dug wells; bore wells, wells for water supply. These resources are under threat from pollution either from human life style manifested by the low level of hygiene. According to WHO organization, about 80% of all the diseases in human beings are caused by water. Once the groundwater is contaminated, its quality cannot be restored back easily and to device ways and means to protect it. Water quality index is one of the most effective tools to communicate information on the quality of water to the concerned citizens. It, thus, becomes an important parameter for the assessment and management of groundwater.

In this study, the levels of some physical, chemical, water quality parameters in hand-dug wells located in the residential areas were assessed. The water used for drinking purposes should be free from toxic elements, living organisms and an excessive amount of minerals that may be harmful to health. The water used by surrounding villages for cooking, drinking, and other domestic purposes is often directly sourced from ground water without biochemical treatment and the level of pollution has become a cause for major concern. There is no any work that reveals the chemical composition of drinking water around Shivale College and nearby village area. The major aim of this research is to investigate the levels of hardness, alkalinity, conductivity, turbidity, pH, TSS, TDS& Salinity in the ground water of surrounding villages and thereafter compare results obtained with the standards set for water quality by the WHO.

## 2. GENERAL DESCRIPTION OF STUDY AREA

The study was conducted in Shivale College and its surrounding villages and covers 15 different water samples that have functional hand pump and motorized water supply system. Shivale located at 10km far away from Murbad city 40 km far away from Kalyan. The total area of the study place is estimated about 20 kilometers and, its average temperature is 27°C. The local village names were used for identifying samples.

## 3. CHEMICALS AND REAGENT

All the chemicals and reagents used for the analyses were in the analytical grade.

## 4. SAMPLE COLLECTION AND PREPARATION

Samples were collected during period of March-April 2018 from 15 different villages. Ground water samples used as drinking water were collected in polyethylene bottles initially from villages, all samples were brought to the laboratory to avoid unusual change in water quality then it is transferred in borosilicate standard measuring flask that soaked in alcohol, were washed with deionized water and dried at room temperature. Afterward, the flask was rinsed several times with the water source to ensure sufficient flushing before collection.

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## 5. PHYSIOCHEMICAL DETERMINATION

The water samples were analyzed for various physicochemical parameters using standards methods five parameters i.e., Temperature (°C), pH and Electrical conductivity (EC) of ground water were determined a with the help of digital portable thermometer, conductivity and pH meter. Total hardness (TH) and calcium hardness are determined by complexometric EDTA titration methods using Eriochrome black T. (EBT) and murexide (ammonium purpurate) indicator respectively. Magnesium concentration is calculated from total hardness and calcium hardness. Total alkalinity (TA), carbonate and bicarbonate concentrations were estimated by titrimetric methods using phenolphthalein and methyl orange as indicator. To measure Total dissolved solid (TDS), the filtered sample was evaporated in a hot oven at 180°C. After the whole sample was evaporated, the evaporated dish was cooled and the final weight was measured and computed with the initial weight measured. Sulphate ($SO_4^{-2}$) ions were determined by a colorimetric method using a UV-Visible spectrophotometer type (JASCO V-530). For the analysis of chloride and fluoride ion, titration (Mohr's method) and colorometric method were used respectively the results of triplicate measurements of each sample were used for the analysis of different parameter of ground water samples.

## 6. RESULTS AND DISCUSSION:

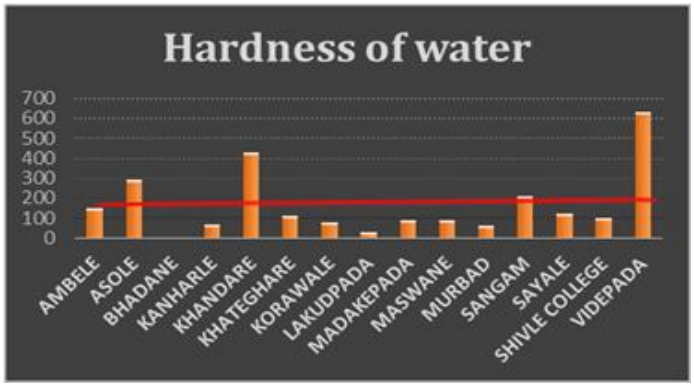
The respective values of all water quality parameters:

| Sr. No. | Name of Area / Water sample | Parameter of Water: Colour | Conductance micro s- | pH | Hardness | Alkalinity | Salinity | Turbidity | TDS | TSS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Ambele** | pale green | 378 | 7.17 | 150 ppm | 39.4 | 0.586 | 13.5 | 0.38 | 0.18 |
| 2 | **Asole** | colourless | 686 | 7.38 | 290 ppm | 49.4 | 1.758 | 21 | 0.48 | 0.3 |
| 3 | **Bhadane** | colourless | 378 | 7.91 | 00 ppm | 10.4 | 1.758 | 38.5 | 0.2 | 0.24 |
| 4 | **Kanharle** | colourless | 185 | 7.2 | 70 ppm | 23.4 | 0.586 | 0.589 | 0.14 | 0 |
| 5 | **Khandare** | colourless | 1503 | 8.99 | 430 ppm | 13 | 5.86 | 190.5 | 0.98 | 0.02 |
| 6 | **Khateghare** | turbid white | 272 | 7.16 | 110 ppm | 36.4 | 1.172 | 0.393 | 0.18 | 0 |
| 7 | **Korawale** | colourless | 225 | 7.19 | 80 ppm | 15.6 | 1.172 | 2.437 | 0.02 | 0.08 |
| 8 | **Lakudpada** | brown | 170 | 7.35 | 30 ppm | 15.6 | 1.172 | 11.5 | 0.04 | 0 |
| 9 | **Madakepada** | colourless | 235 | 6.98 | 90 ppm | 23.4 | 1.172 | 15.5 | 0.04 | 0.3 |
| 10 | **Maswane** | light green | 223 | 7.56 | 90 ppm | 33.8 | 1.172 | 0.471 | 0.12 | 0.04 |
| 11 | **Murbad** | light green | 160 | 7.77 | 60 ppm | 18.2 | 1.172 | 0.786 | 0.4 | 0.04 |
| 12 | **Sangam** | turbid green | 460 | 7.3 | 210 ppm | 52 | 1.172 | 0.0393 | 0.24 | 0.48 |
| 13 | **Sayale** | colourless | 209 | 7.18 | 120 ppm | 39 | 1.17 | 5.5 | 0.24 | 0.28 |
| 14 | **Shivle** | green | 258 | 7.21 | 100 ppm | 36.4 | 0.586 | 0.5502 | 0.22 | 0.02 |
| 15 | **Videpada** | pale green | 1722 | 8.22 | 630 ppm | 10.4 | 8.79 | 198.5 | 1.92 | 0.02 |

**1) pH**: pH of solution is taken as –ve logarithm of $H^+$ions for many practical practices. The pH range from 7 to 14 is alkaline, from 0 to 7 is acidic and 7 is neutral. Mainly drinking water pH lies in the range of 4.4 to 8.5. The pH scale commonly rangesfrom 0 to 14.

**2) Elec.Conductivity**: Conductivity is the capacity of water to carry an electrical current and varies both with number and types of ions the solution contains. In contrast, the conductivity of distilled water is less than 1umhos/cm. This conductivity depends on the presence of ions their total concentration, mobility, valence and relative concentration and on the temperature of the liquid. Solutions of most inorganic acids, bases, and salts are relatively good conductors.

**3) Total hardness**: As per IS: 10500-2012 Desirable limit and Permissible limit for hardness is lies between 200 to 600 mg/l respectively. The Treatment of hard Water is Softener Ion Exchanger and Reverse Osmosis process. The degree of hardness of drinking water has been classified interms of the equivalent CaCO3 concentration as follows: Soft - 0-60mg/l, Medium - 60-120 mg/l, Hard - 120-180 mg/l, Very hard - >180 mg/l.



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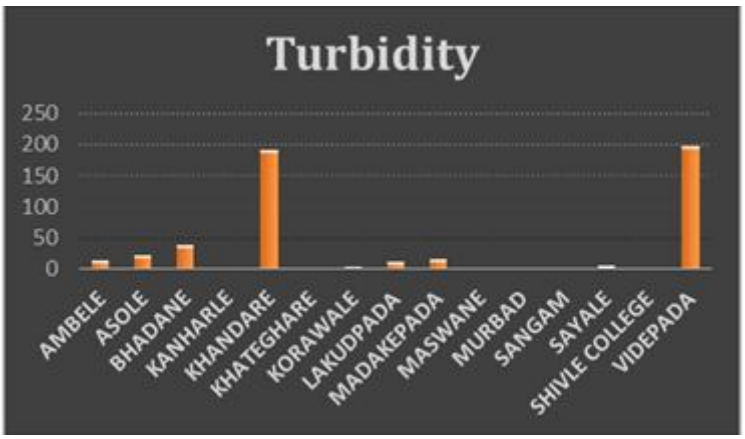
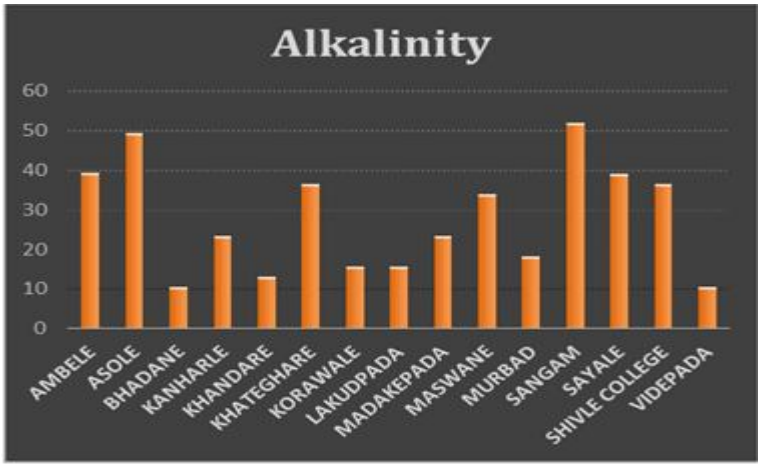
**4) Turbidity**: Natural water contains sulphate ions and most of these ions are also soluble in water. Many sulphate ions are produce by oxidation process of their ores, they also present in industrial wastes. The method to measure quantity of sulphate is by UV Spectrophotometer. As per IS: 10500-2012 Desirable limit for Sulphate is 200 and 400 mg/l in Permissible limit.




**5) Total alkalinity**: Alkalinity is the sum of total components in the water that tend to elevate the pH to the alkaline side of neutrality. It is measured by titration with standardized acid to a pH value of 4.5 and is expressed commonly as milligrams per liter as calcium carbonate (mg/l as $CaCo_3$).Commonly occurring materials in water that increase alkalinity are carbonate, phosphates and hydroxides.




**6) TDS and TSS:** The total dissolved solid refers to the materials that are completely dissolved in the given water sample. These solid are soluble and filterable in nature. It is defined as the residue upon evaporation of filterable solids.The term total suspended solid (TSS) can be referred to materials which not dissolved in water and are filterable in nature. It is defined as the residue upon evaporation of filterable solids on filter paper.

**7) Salinity**: It is the quantity of dissolved salts content in a water . salinity of the ocean is about 33-38 ppt . The maximum considered safe for drinking water is 1 ppt (1000 ppm ).

**7 . ONE WATER SAMPLE OF SHIVALE IS COMPARED WITH STANDARD VALUES OF WHO AND IS: 10500**

| Sr No. | Properties | Shivle Water sample values | WHO values | IS : 10500 values |
|---|---|---|---|---|
| 1 | **Colour** | colourless | unobjectionable | unobjectionable |
| 2 | **Hardness of water** | 100 ppm | 300 | 300 |
| 3 | **Conductance** | 258µS | NO guidelines | 200 µS - 800 µS |
| 4 | **pH** | 7.21 | 6.2 to 8.2 | 6.5 to 8.5 |
| 5 | **Alkalinity** | 36.4ppm | 200 ppm | 200 ppm |
| 6 | **Salinity of water sample** | 0.586 ppm | 5mg/$dm^3$ | 250 ppm |
| 7 | **Turbidity** | 0.5502 ppm | 1.5 NTU | 200 ppm |
| 8 | **TDS** | 0.22 mg/$dm^3$ | 300mg/$dm^3$ | 500 mg/$dm^3$ |
| 9 | **TSS** | 0.02 mg/$dm^3$ | 300mg/$dm^3$ | 500 mg/$dm^3$ |

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## 8. CONCLUSION

Groundwater is an important source of drinking water for many people around the Murbad . Contamination of groundwater generally results in poor drinking water quality, loss of water supply, high cleanup costs, high-cost alternative water supplies and potential health problem. In the present study comparing measured parameters of each sample with standard values, the water samples from Shivale college nearby villages is found to be safe and suitable for drinking purposes except the two samples collected from Khandere and Videpade. The majority of groundwater sources belong to Khandere &Videpade, indicating high values conductivity , hardness , salinity and turbidity of which can have adverse effect on human health.

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# AWARENESS AMONG INVESTORS WITH RESPECT TO CROWDFUNDING OF A PROJECT

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**ABSTRACT**
*Crowdfunding has emerged as a particularly prominent source of alternative finance for new ventures. This new opportunity to fund one's dream project with click of a button is rapidly being looked upon as a solemn way of raising funds for startups and new businesses. Crowdfunding uses web technologies, web portals and existing online payment systems to facilitate transactions between entrepreneurs or project starters (people who request funds) and fund providers (people who give money). To raise funds, one can create an online profile to explain the purpose project and fund-raising goals. This idea can be shared with public at large, including peers, relatives, friends of friends etc. There are minimum three parties involved in the Crowdfunding activity namely Project Campaigner or Entrepreneur, Platform provider and Crowd or Investor.*

*The present research is an attempt to contribute insights on this emerging phenomenon of Crowdfunding from fund Providers perspective and also about the investor's preference to crowdfund new projects*

*Keywords: Crowdfunding, startups, Alternate finance, fund raising, crowdsourcing*

## 1. INTRODUCTION

Crowdfunding is a way to solicit funds from other individuals to realize projects. Proceedings of the Academy of Marketing Science book series (DMSPAMS) Abstract defined Crowdfunding as "an open call over the internet for financial resources in the form of monetary donation, sometimes in exchange for a future product, service or reward". Online Crowdfunding is an emerging and innovative online platform that provides small businesses and start-ups with opportunities to increase their social media presence, investment base, and funding prospects. It uses web technologies and existing online payment systems to facilitate transactions between creators (people who request funds) and funders (people who give money). The ideas span across fields and vary in scope. One can create an online profile.

## 2. OBJECTIVES OF THE STUDY

1. To understand up to what extent the investors are willing to crowdfund for a new project
2. To understand the majorly accepted models of Crowdfunding
3. To explain the regulations laid down by SEBI with respect to crowdfunding

## 3. RESEARCH METHODOLOGY

**Coverage:** Geography: -The area selected for study is online and cannot be geographically marked.

Target Group: The target group selected is people using Social Media Networks,

**Method of data Collection**

Primary data: is collected by using structured questionnaire through personal interviews and online interviews. Google form has been used for collection of primary data.

Secondary data: is collected through Magazines, Websites, published research papers, online journals, Reference Books etc.

**Sampling Method:** The Purposive & Convenience sampling method is used as a sampling method.

**Sample Size**: 35 respondents

## 4. SCOPE OF THE STUDY

1. This study covers the willingness of the investor's to help crowdfund a project.
2. As today one of the many hurdles that youth start-ups are facing in support of their pre-start-up capitals is access to finance. This data can be used by the youth for start- ups as one of the source of alternative funding in assisting them to purse pre- start- up capital.
3. Finally it will help to create mass awareness and encouraging larger participation of the fund provider

## 5. LIMITATIONS

The sample in the present study is quite small; hence, the generalization of the findings is limited. As the area selected for study is online, so the respondents cannot be geographically marked. Since there is very low understanding about crowdfunding, the number of responses are very less.

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## 6. LITERATURE REVIEW

"Crowd funding: disinter mediated investment banking" a paper published in MPRA in 2012 by Rubinton discusses investment banking opportunities due to Crowdfunding. In 2013 a paper published elaborated why people are motivated to post fund projects on Crowdfunding platforms. This funding option has also inspired microfinance companies to raise finance using social media

Ross Brown; Suzanne Mawson; Alexander Rowe and Colin Mason (2014) discuss about Equity crowdfunding and its importance for entrepreneurs today. The study found strong demand for equity crowdfunding from entrepreneurs in consumer-focused, early stage firms. Crowdfunding also seems to confer important intangible benefits to investee companies, in terms of firm valuation and product validation.

## 7. MODELS AND SEBI GUIDELINES FOR CROWDFUNDING:

**7.1 Models of crowd funding:** The concept of crowd funding model seems to be very easy where often a large cluster of people accepts to finance a project by investing relatively small amount of money via web platform and virtual money transfer tools. But in reality there are divergent models of crowd funding via which money is raised. An acronym D.R.E.I.M. which is a minivation of commonly available fund raising models which stands for (Chris Buckingham, 2012) :

- Donation
- Reward
- Equity

**7.1.1 Donation Model:** The funding is given in the form of donations and thus donors do not expect any tangible benefits as return. In most of the cases, it is for social/philanthropic purpose.

**7.1.2 Reward Model:** In this case the funding is given with an expectation of some benefits may be immediate or future rewards. These rewards should be tangible (in the form of future customer/membership). The reward crowd funding can range from 'a thank you note or some returns in the form of token of appreciation. It also includes the pre-purchase option which allows investors to receive the product that the entrepreneur is making, often at a reduced price (Griffin 2012).

**7.1.3 Equity based model:** This model is also known as investment model. Here the investor receives an equity stake in the project. In simple terms, the company sells some or all of its shares to the members of the crowd. As equity owners of the company, the crowd realizes a return of its investment if the company performs well and receives a share of the profits in the form of a dividend. Equity crowd funding is often subject to securities and financial regulation since it involves investment into a commercial enterprise.

### 7.2 Emerging areas of Crowd funding

Crowd funding can be successfully used for raising funds for variety of causes. A few of them are:

- Funds for Innovative and creative small business initiatives such as smart wallet, film making, startups, Small & Medium Entrepreneur IPO ,Mentorship resources, Marketing and content support facility, Micro finance funding,
- Funds for medical patients for treatment in India & Foreign countries, NGO Campaigns, community & social development projects, social media campaigns, building schools , library and books funding,
- Funds for travelling and adventure trips, students projects overseas, sports and teams , research projects, study and education in Foreign Universities,
- Funds for personal purposes such as medical emergencies, court case, memorials and funeral ,pets & animals, learning musical instruments,
- Funds for military & veterans, senior citizens, kids and women welfare

### 7.3 SEBI guidelines on crowdfunding

The passing of the JOBS (Jumpstart Our Business Startups) Bill in US has led to discussion over a similar Bill in India. There are no specific regulations for Crowd Funding in India as per now. However, in June 2014, SEBI has issued consultation paper on crowd funding in India. SEBI may allow equity/debt crowd funding with following proposed rules.

- Crowdfunding platform can be provided by only SEBI registered entities, while companies can raise up to Rs.10 crore in a year with maximum 200 individual investors.

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- Only ascribed investors shall be allowed to participate in crowdfunding activities explicitly institutional investors, HNIs, and retail investors advised by portfolio managers or investment advisors.
- Retail investors can invest maximum up to Rs. 60000 or 10% of their net worth.
- A company which have four or more years of experience or companies listed on stock exchange shall not be permissible to raise funds from this route.
- Only those entities which are not associated with any business group having turnover of more than Rs.25 crore shall be allowed to raise funds from crowdfunding.
- The entities engaged in real estate or financial sector shall be disqualified of crowd funding option.

In the later part of 2016, over 20 crowdfunding platforms were deemed 'illegal' by SEBI. Reward-based and Donor-based platforms still operate, while equity based crowdfunding has seen a lot of scrutiny from SEBI.

## 8. DEMOGRAPHIC DETAILS OF THE RESPONDENTS

| Gender | |
|---|---|
| Male | 18 |
| Female | 17 |
| Total | 35 |

| Year of Birth | |
|---|---|
| 18 - 25 | 25 |
| 26 – 35 | 04 |
| 36 – 45 | 05 |
| 46 and above | 01 |
| Total | 35 |

## 9. DATA ANALYSIS AND INTERPRETATION

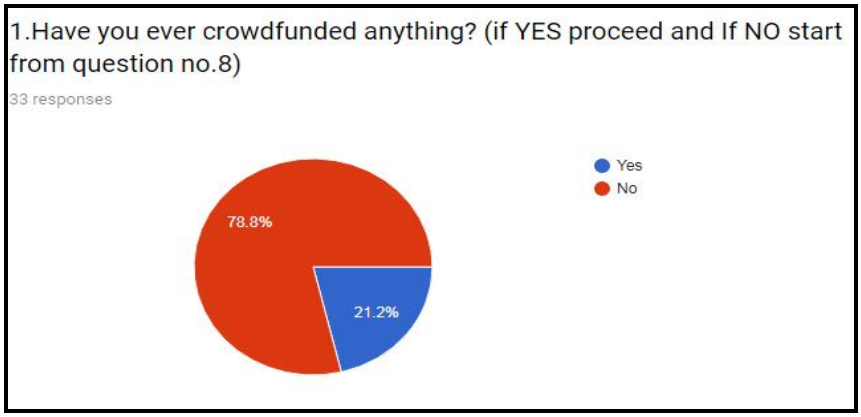


Figure-1: View in respect to crowdfunding

**Interpretation:** Only 21.2 %of the respondents had crowd funded the project Where as 78.8% had never thought of crowdfunding of project. So it can be interpreted that majority of people are not aware about crowdfunding as one of the financing option

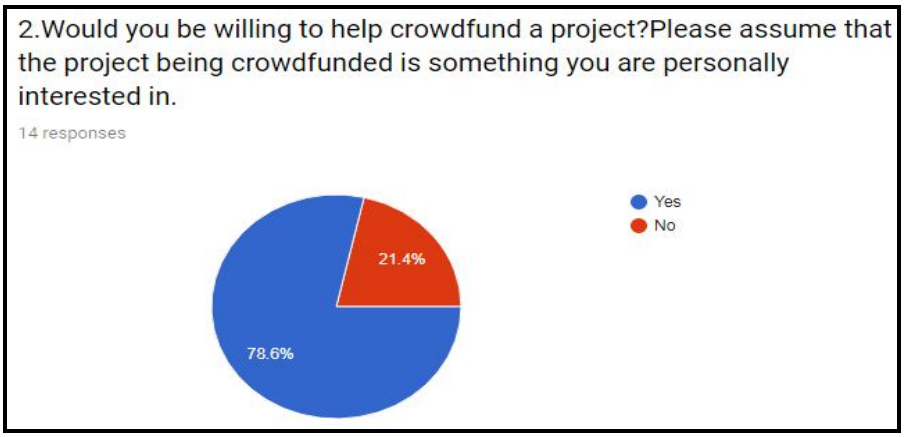


Figure-2: View in respect to willingness to crowdfund a project

78.6% respondents are willing to crowdfund a project. This shows that if more awareness is created with respect to crowdfunding, there can be good market potential for crowdfunding.

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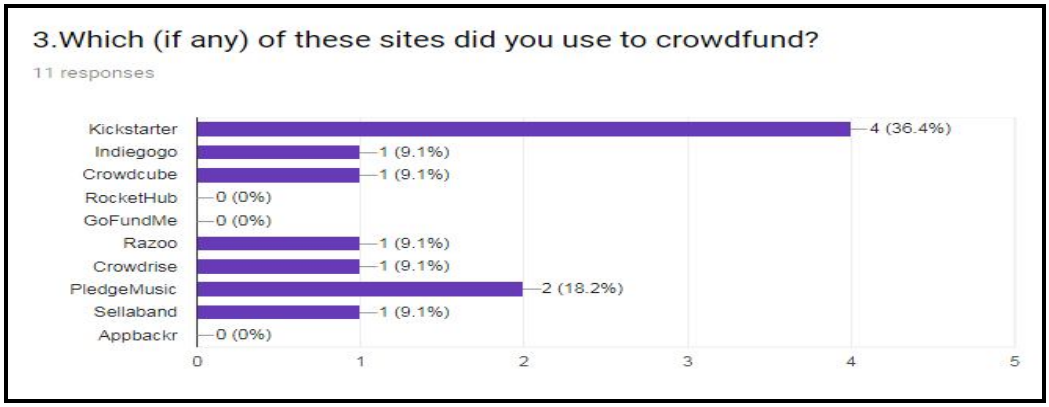


Figure-3: Preference for crowdfunding sites

36.4% of the fund providers are using Kickstarter as a platform provider for the purpose of crowdfunding. From this can be interpreted that Kickstarter is considered to be one of the most reliable platform provider

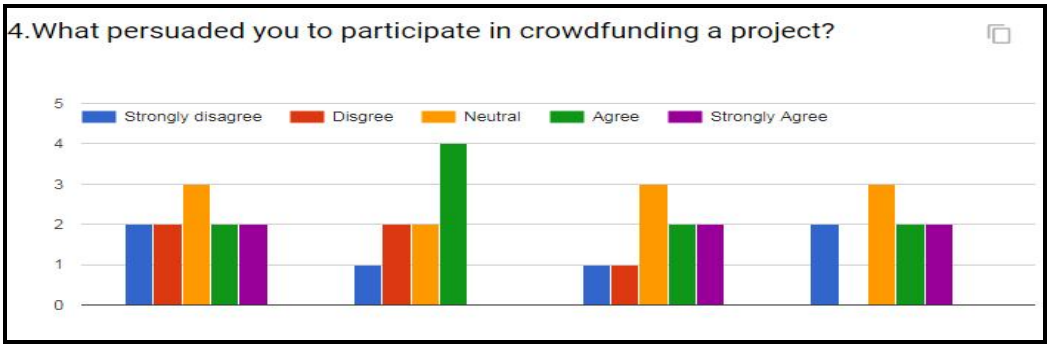


Figure-4: Persuasion to participate in crowdfunding a project

Nostalgia (e.g. a high definition re-release of a game/movie/etc. which you enjoyed in the past)

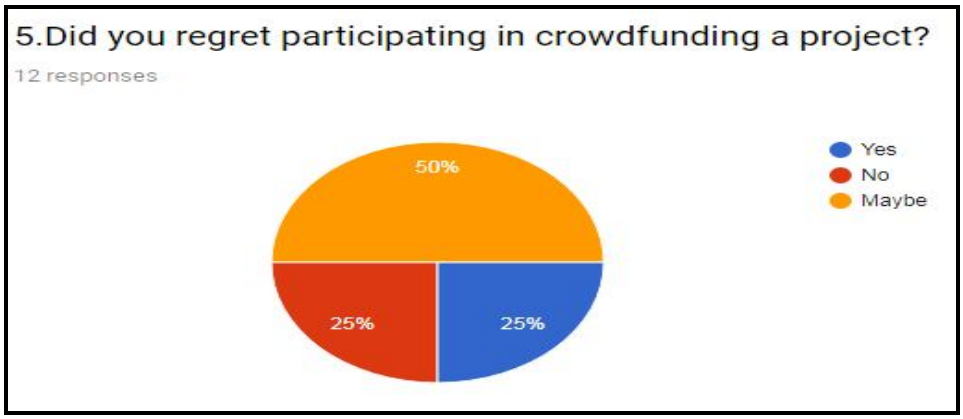


Figure-5: View in respect to regret participating in crowdfunding a project

25% of the respondents regret participating in crowdfunding a project

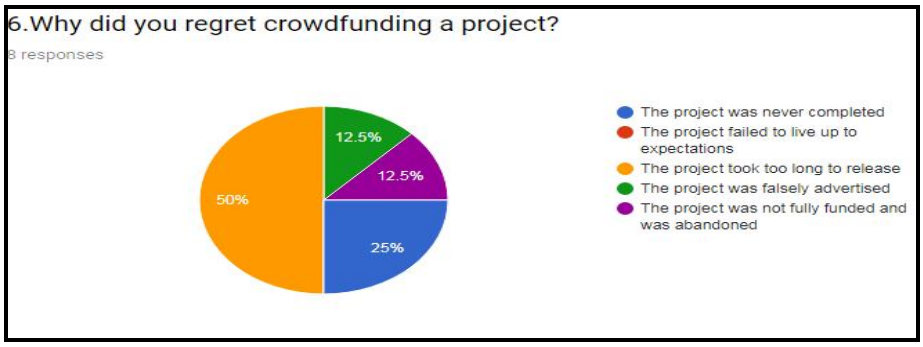


Figure-6: View with respect to regret to crowdfunding a project

50% of respondents regret because the project took too long to release and around 25% respondents regretted because the project was never completed on time

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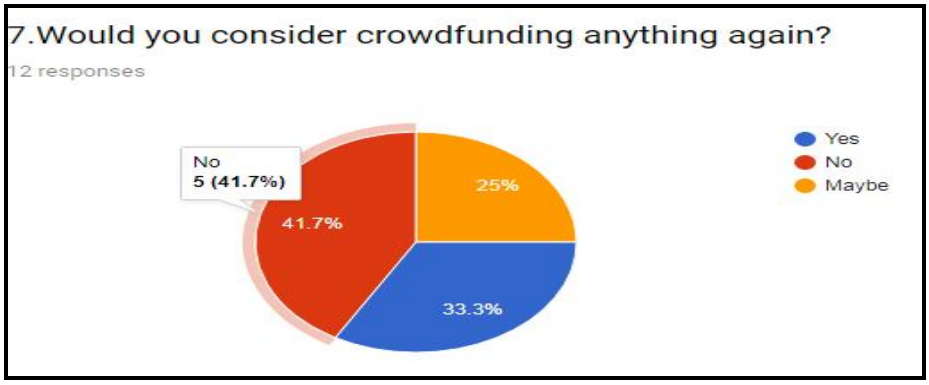


Figure-7: Preference to crowdfund any project again

41% of the respondents is of the view that they wouldn't crowdfund any project

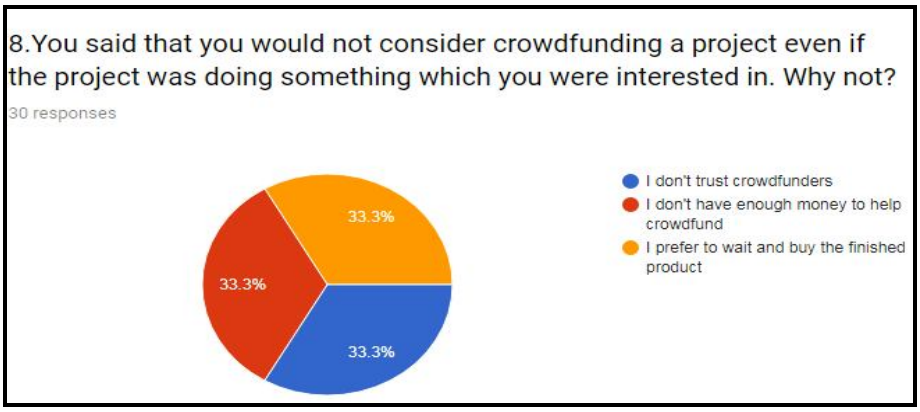


Figure-8: Reason for denying to crowdfund a project

33.3% is the response for all the options provided. Respondents are indifferent to all the option

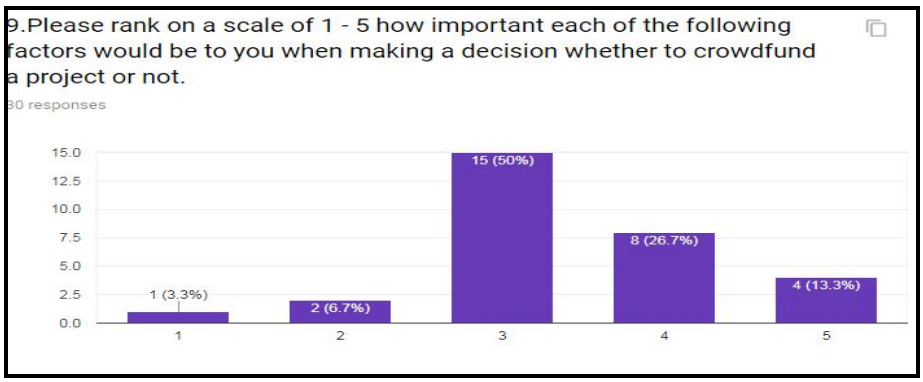


Figure-9: Factors responsible for making decision regarding crowdfunding a project

For 50% of the respondents Reward for the backers is the factor that will influence them to make decision regarding crowdfunding

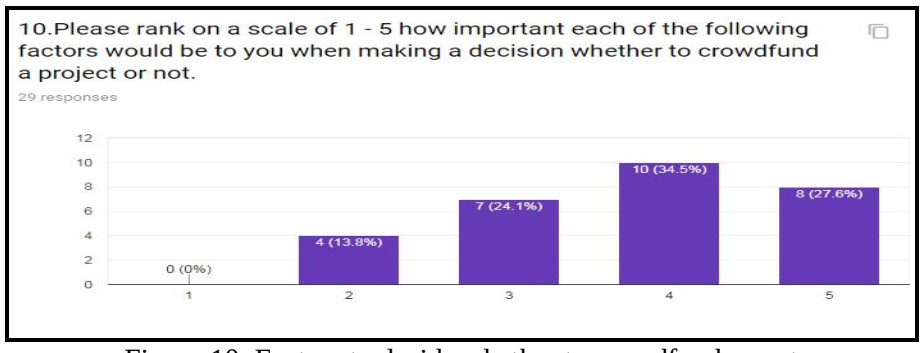


Figure-10: Factors to decide whether to crowdfund or not

34.5% of the respondent considered regular updates on the progress of the creators as the most important factor for crowdfunding a project or not

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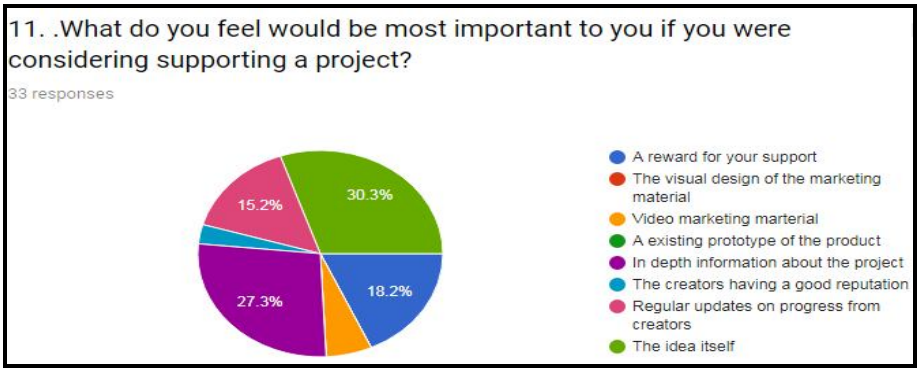


Figure-11: Most important factor to support a project

30.3% of the respondents considered the idea itself as one the most important factor for supporting a project

## 10. FINDINGS

1. Majority of the respondents are not aware about crowdfunding as one of the financing option
2. Though the awareness level is very low still the investors are willing to crowdfund a project
3. In-depth information about the project had influenced a lot to support crowd funders

## 11. SUGGESTIONS

1. In the absence of a proper legal regime, the funding platforms reputation is at stake. Hence platform providers can come with some different strategy to attract crowdfunders
2. SEBI should make a concrete legal framework for the crowdfunders, Platform providers and the creators Not only for young start-ups but for other continuing needs of business crowdfunding be used.Even sick industrial units can use crowdfunding as one of the financing option

## 12. CONCLUSION

Even though the number of academic studies has been increasing, the coverage of the population is relatively weak and not well understood by entrepreneurs and individual investors. While crowdfunding is one of the most exciting things to happen to entrepreneurs and startups it is yet to get universal acceptability by a large section of crowd.. There are serious concerns and issues which need to be taken into account for this online of funding option to boom. India is also working on consultation paper on crowd funding and is expected to bring in the requisite laws to support this in a big way, as efficient crowd funding system can really play the role of catalyst in bringing the startup ideas into reality. The good news for both inventors and innovators is that crowdfunding is becoming more publicly recognized and legitimized as a means of funding projects with each passing day. The crowdfunding scene is currently characterized by high dynamics with increasing numbers of projects from various application fields that are trying out the crowdfunding option. Although it might suffer from various risks in its today‘s nascent stage, crowd funding do hold a great potential for future in India and worldwide.

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# STUDIES ON THE RAPID DEATH OF THE RAIN TREES (*ALBIZIA SAMAN OR SAMANEA SAMAN*) IN SRISTI AREA OF MIRA ROAD (EAST) IN THANE DISTRICT, MAHARASHTRA

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**ABSTRACT**
*Albizia saman is a very well-known trees in the Mumbai city and Suburbs area of Mumbai. Due to their huge evergreen canopy and beautiful flowering, they have been planted along the roadsides and garden plots across the city. It has been observed that since past few years, they are on the verge of the death on large scale. Hence, the studies were carried out to investigate the causes of the death of those trees in the Sristi area of Mira road (East); located in north of Mumbai in District Thane in Maharashtra. It has been already found that the cottony Mealy bugs, white fungus and plant beetles were found to be the main agents to cause the infestation. Apart from the external agents, some internal helminth nematodes have also been reported during the present studies in Roots and Stems. The internal helminth parasites have been reported for the first time and are suspected to be one more and major reason for the lethal effect on Rain trees. Mealy bugs, fungus and helminth nematodes were detected in various parts of Albizia and cause damage to those concerned parts. Hence, now it is the need of the time to take quick measures in controlling these agents by different GOs, NGOs and volunteer organizations. It is also essential to look that before the helminth parasites choose a new host for infestation, the preventive and control measures could be implemented properly and effectively. It will help to avoid damage to the existing local ecosystem and to carry a smooth sustainable Plant management in the locality.*

*Keywords: Albizia saman, Fungus, Mealy bugs, Nematodes, Sristi*

## A] INTRODUCTION

*Albizia saman* or *Samanae saman* is a species of flowering tree with umbrella shaped canopy belonging to the family Fabaceae.These plants are native to Neotropical region .*Albizia saman* are commonly known as Monkey pod, Rain tree and Saman. Rain trees basically extends from Mexico south to Peru and Brazil, but it has also been widely introduced to south and Southeast Asia as well as pacific islands. Albizia usually grows up to 15 to 25 m height but at very rare conditions they can even grow to 50m with the crown much wider .because of its huge crown it is one of the important shade giving trees and are more often grown throughout. *Albizia* can be easily identified by their bipinnate and compound leaves with leaflets that grow up to 1to 1.5″ long. *Albizia* are very famous as rain tree, as during night time or rainy season or during cloudy day when it rains, the leaves gets folded and through these folded leaves water easily gets drip down towards the ground and results into the growth of grasses and other plants under its crown and thus the name is given as “Rain tree”. Due to these characteristics of albizia it is widely grown and it is well-known name in the Mumbai city and suburban area of Mumbai. The initial growth of these plants is slow but the survival rate is good and thus are selected for been planted along the roadsides, garden plots across the city from many years. But it was observed that these plants are on the verge of death on a large scale in the Mumbai city and surban regions. Many articles are also published in the newspapers showing concerns towards the massive death. But yet the actual causes of the rapid decline is like a riddle still unsolved. The plants one’s dead or dried are been cut down rapidly and are been incinerated or dumped in the dumping grounds. To find the answer to as why is there a decline? What is the main reason and who plays a major role in bringing albizia to the lethal stage? Hence a study was carried out in srishti area of Mira road, Maharashtra which itself has a huge population of these trees and same problems are been noticed from past one year.

## B] OBJECTIVE

1] Complete investigation and evaluation of rapid death of rain trees in the study area.

## C] MATERIALS AND METHODS

### a) Study area

Srishti is one of the prominent area in Mira road, a town in Maharashtra, India a part of the Mumbai Metropolitan region located to the north of Mumbai at latitude 19.47°N and longitude 72.8°E.It is governed by Mira bhayander Municipal Corporation. It is a very fast developing suburban as it provides easy connectivity to Mumbai, thane and navi Mumbai and at present very well famous as the fastest growing areas of the city.it has many famous area like Shanti nagar, Lodha complex, Evershine enclave including study area Srishti etc. The Mira-Bhayandar region comprises an area of 79 $km^2$. A marshy creek divided Mumbai and Mira Road. To the

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north lies Vasai Creek, to the east Sanjay Gandhi National Park and the Uttan coast, to the west. It mainly is of Deccan lava terrain and consists of waterlogged and marshy areas. The climate here is like that of Mumbai.

Many roads are constructed around and in the srishti area. On either sides of these roads many trees are been planted to enhance the beauty of the area and also to control the pollution as they act as bio purifiers. Some of the plants seen are rain tree, subabool, Peepal, Copper pod etc. During the study the following areas were surveyed Bhakti Vedanta swami Marg, Penkar pada road, Shri Niranjanlalji Dalmia marg,Srishti 100 feet road, Nav yuvan road,Jai Mata di Chowk,Keshav Hari marg.

**b) Methods**

1) Study Period: three months from November 2015 to February 2016.
2) Identification of the rain tree by studying the various morphological characteristics like Leaves, flower, stem and fruit.
3) Tree census: The total no of rain trees were counted in the above mention area and a Record on infected, non- infected and dead trees was maintained throughout the study Period.
4) The sample of barks, stems, leaves, roots etc. from the infected, healthy and dead plants were collected along with the plant-beetle *Halyomorpha halys*, *cotton* mealy bugs and were brought to the laboratory for the further examination. Stain like Cotton blue was used for staining fungi.
5) Microscopic examination: the plant samples collected were examined under the compound Microscopes and the plant beetles and mealy bugs were studied under the stereo Microscope to study the external morphology.
6) The plant beetles *Halyomorpha halys* were then dissected under the microscope to detect the presence of nematodes in the gastro intestinal tract, under the wings etc.
7) The beetles, mealy bug, fungi and nematodes were identified with the help of key available.

**D] OBSERVATION TABLES**

**Table-I: showing the no of rain trees in srishti area.**

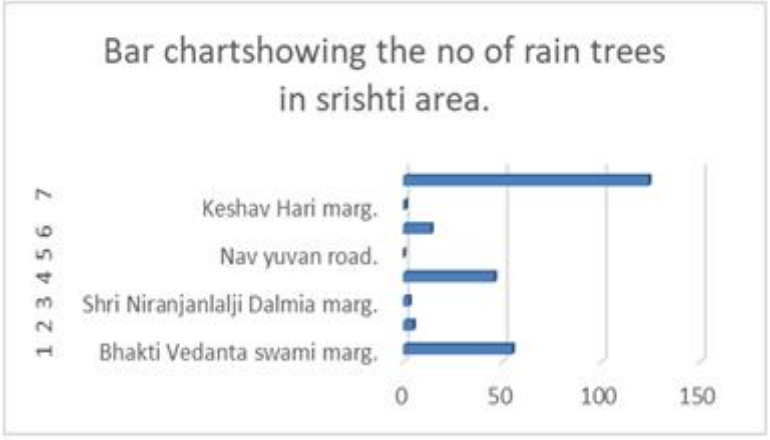
| Sr. No. | Name of the road | No. of rain trees |
|---|---|---|
| 1 | Bhakti Vedanta swami marg. | 55 |
| 2 | Penkar pada road. | 05 |
| 3 | Shri Niranjanlalji Dalmia marg. | 03 |
| 4 | Srishti 100 feet road. | 46 |
| 5 | Nav yuvan road. | 00 |
| 6 | Jai Mata di Chowk | 14 |
| 7 | Keshav Hari marg. | 01 |
| | Total | 124 |

**Table-II: Showing the count of Infected, non-infected and dead *Albizia saman***

| Sr. No. | Plant name | Infected | Non-infected | Dead |
|---|---|---|---|---|
| 1 | *Albizia saman* | 34 | 38 | 52 |

**E] BIOSTATISTICAL PRESENTATION**

**1] Bar chart showing the no of rain trees in Srishti area**



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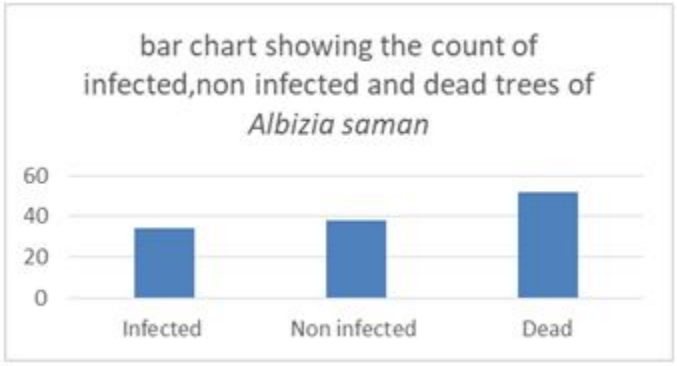
**2] Bar chart showing the count of Infected, non-infected and dead *Albizia saman***




**F] RESULTS AND DISCUSSION**

1) Tree census: during the entire period of studies, a total of 124 albizia saman trees were counted in the entire Srishti region were chosen for the study as mentioned above.
2) Nature of the trees: it was observed that out of 124 albizia saman counted, 34 were found to be infected, 38 were non-infected and 52 were entirely dead. The infected trees were found to show black tarring which is usually liberated in defense and even the secretion of the gums was reported in maximum infected trees. Secretion of gum is also a sign of defense towards some kind of infection by the plants.
3) The 34 plants which were found unhealthy were infected by mealy bug, *Dysmicoccus neobrevipes*, Fungi, *Fusarium* sps. and *Ophiostoma* sps.
4) Apart from fungi and mealy bugs it was found that even a plant beetle (i.e.) *Halyomorpha halys* was reported in large number on these trees. All the stages of the life cycle was observed right from the hatched and unhatched eggs till the adults along with the intermediate stages. These beetle species very beautifully camouflage with the stem region, which make one difficult to identify them. These beetles are been related with the decline of rain trees for the first time in Mumbai city and suburban area. But the interesting fact found about these beetles were they were observed only on the young plants and on the plants which have started showing the infection. Thus it can be said that these beetles are also one of the reasons in the decline of the albizia saman. These beetles shows a piercing and sucking type of mouth parts which very clearly indicated that they feed on the plant sap. Thus decreasing the nutrient content availability for the plants themselves. Apart from this, the nematode was also reported in the digestive system of these beetles. Which clearly indicates that they may serve as a vector for the transmission of these nematodes which may themselves be one of the vectors in bringing about the lethal effect in albizia saman.
5) In this case two possibility can occur, first these beetles may act as a host for the completion of the lifecycle of the nematodes which prove to be harmful to the plants or second that due to the sucking and piercing type of mouth parts, during their feeding activity the nematode must have entered from the tissues into the GI tract of these beetles.
6) Apart from the external agent, some of the internal agents were also reported. Three different types of nematodes which were in living condition were observed during the study in the root region and in the barks region especially the cortical cells. This is also been observed for the first time wrt albizia saman. These nematodes like the beetles may feed on the sap of the plant reducing the nourishment for the plants and even they may result in blocking the vessels which may interrupt the conduction function in these plants and thus leads them towards the death. Some of the trees were also found showing all the upper branches dried and dead with hardly any leaves. Here these vectors may also be playing a vital role to take these plants towards dieback disease. The identification of these nematodes are still in progress.
7) Unlike the other area of Mumbai city, the clusters of mealy bugs were found in quiet a good number. These white cottony creatures were found in majority of the structure of the plants like on leave, stem, young twigs etc. These mealy bugs too feed on the plant juices with the help of stylet they possess which they puncturing in the plant body. These are one of the external pest for not only rain trees but also many different plants. Apart from creating the scarcity of sap, Those bugs reproduce rapidly and wrap themselves around the leaves resulting into creating disturbance in photosynthetic activity and latter yellowing of leaves and pre falling.
8) Even the symbiotic association between the ants and mealy bug was reported. The ants feed on the honeydew of mealy bugs. If the ants fail to feed on honeydew, it may result in entangling of the bugs in this

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sugary secretion and may result into the death of these tiny, soft creatures. In return to that, the ants help the mealy bugs in transportation from one plant to another and even protect them from some predator.

## G] CONCLUSIONS

Thus, it can be concluded from the above finding that the rain trees are under a great threat from the external and internal agents which are continuously harming this crowned living being.it can be seen that A*lbizia saman* is greatly infected by the Cottony scaly mealy bug, *Dysmicoccus neobrevipes*, plant beetle - *Halyomorpha halys*, fungi sps and the unidentified species of nematodes. The attack of these four predators at a time has resulted in causing these threatening situation of massive death of these evergreen crowned canopy. If such damage continues for a longer period, it may result into totally eradicating these beautiful trees, which are present for serving us in many ways. Once if this host disappears, these vectors or parasites can adapt to a new host; which in itself is also a matter of great concern. Thus a very quick action should be taken into this issue by the GO's, NGO's and voluntary organizations, so that there is no disturbance caused in the local ecosystem and will help in carrying out smooth plant sustainability. Further studies on the plant nematodes with respect to rain trees can be conducted.

## H] ACKNOWLEDGEMENT

Authors want to thank Mrs. (Prof.) Vinita Rodrigues, department of Botany and Mr. (Prof) Ravindranath G., Department of Zoology, Royal College of Arts, Commerce and Science. Mira road (E) for their motivation and continues support throughout the study.

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# FISH MORTALITY AT LAKE MASUNDA, THANE

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**ABSTRACT**
*Sewage disposal and solid wastes are rapidly degrading the urban fresh water resources. Masunda Lake in Thane is influenced by nutrient enrichment resulting in algal growth. This study revealed the association between fish mortality and algal bloom at this lake during winter 2018.*

*Keywords: Fish mortality, algal bloom*

## INTRODUCTION

Urban fresh water ponds and lakes are continuously subjected to anthropogenic activities creating stress on these habitats. These lakes chiefly act as centers for recreation and are identified for their aesthetic values. In Thane city (Maharashtra), these water bodies are subjected to nutrient enrichment due to sewage disposal and addition of solid wastes.

The physicochemical parameters of water were studied immediately after report of fish mortality from Masunda Lake.

## MATERIALS AND METHODS

Surface Water samples were collected within twenty four hours of reported fish mortality during November 2018. Various physico-chemical parameters were analyzed as per the standard procedures (APHA, 1998). Phytoplankton samples were collected and preserved with Lugol's Iodine solution. The concentrated samples were analyzed for abundance and dominance. Identification was carried out using standard key (Bellinger, 1992).

## RESULT AND DISCUSSION

Eutrophication is a natural process occurring at slow rate in natural water bodies. However addition of pollutants in liquid or solid form influences the rate at which the eutrophication takes place. Masunda Lake is influenced by anthropogenic activities, as it is one of the important site for recreation and relaxation. An algal bloom was reported during 2015-16 (Gupte *et al.*, 2016) which indicated deterioration of physicochemical environment. Such algal blooms are reported at various lakes in Indian region. (Srivastava and Srivastava, 2017; Baruah and Kakati, 2012; Singh and Balasingh, 2011). Though the local authorities are taking the essential steps to control any waste dumping, this is not effectively translated in cleaning the water body. The fish mortality was observed to be at moderate level as the dead fish density ranged from 100-1000.

It was observed that the mortality was related to bloom of *Microcystis aeruginosa* (Cyanophyceae). The surface water appeared turbid and green with floating scum with oily appearance. Such fish kill associated with algal bloom was reported at Jail Lake in the city. (Sarang and Somani, 2016).

The samples exhibited high levels of Nitrates indicating enrichment, utilization and release during the bloom phase. (Table-1). As compared to the previous reports of bloom, these samples showed negligible representation of other algal members including *Pediastrum sp*. and *Scenedesmus sp*. This showed about 66% reduction in algal diversity. In terms of abundance, *Microcystis aeruginosa* was recorded as the only prominent member which formed the bloom and resulted into hypoxia.

Fish mortality, High level of nutrients and intense algal blooms are indicating that the lake is in deteriorating condition. Though aerators are installed, the stagnant conditions on the sides of the water body probably create favourable conditions for bloom development. Surprisingly the Brown headed sea gulls appeared in the lake in late winter and are recorded after many years at this water body.

The lake needs urgent monitoring and control of any addition of wastes as the toxins produced by the algal blooms will adversely influence the food web of the lake. There is a need for sustainable management of these resources.

## ACKNOWLEDGEMENT

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**Table-1: Physico-chemical Parameters**

| Water Parameters | Average Value (mg/L) |
|---|---|
| Dissolved Oxygen | 1.4 |
| Free carbon dioxide | 88 |
| Total Alkalinity | 200 |
| Chlorides | 32.27 |
| Calcium | 30.06 |
| Total Hardness | 110 |
| Total solid | 1,020 |
| Total dissolved solid | 800 |
| Total suspended solid | 220 |
| Nitrate Nitrogen | 0.90 |
| Inorganic Phosphorus | 2.9 |
| Reactive Silica | 20 |

**Figure-1: Dead fishes at Masunda Lake**

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# OCCURRENCE OF FAIRY SHRIMP IN HILL PONDS, NORTH WESTERN GHATS

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## ABSTRACT
*Vernal waters are unique habitats in contrast with permanent lotic and lentic habitats and are described by the cyclic procedure of drying and filling. Their biodiversity is remarkably high consisting of species with adaptations to withstand draught or frozen periods. Korigad is part of the North Western Ghats in Pune district. Two vernal ponds are located on top of Korigad plateau adjacent to each other. Fairy shrimps (Streptocephalus spp) were recorded in these vernal ponds. In monsoon during heavy rain fall, mixing of water between these two ponds can be observed.*

*Keywords: Fairy Shrimp, Western Ghats, Korigad*

## INTRODUCTION
Fresh water ecosystem is an essential natural resource for sustaining aquatic animals which are important and integral part of it. These ecosystems are unique and diverse. The northern Western Ghats consists of flat table-topped hills which are the result of collective geological events involving basalt flows (Watve 2013). Such flat table tops are popularly called 'rocky outcrops'. This part of the Western Ghats receives approximately four-month period of monsoon with heavy rains and about eight months of dry period (Dahanukar *et al.* 2004) during which a large number of vernal pools are formed.

The fairy shrimp which capitalize these vernal pools, consume phytoplankton and bacteria (Dierckens *et al.*, 1997), rotifers (Starkweather, 2005), nematodes (Jocque *et al*., 2010) and small invertebrates (Mertens *et al.*, 1990).

Padhye *et al.* (2016); Padhye and Dahanukar (2015) studied egg morphology, distribution of large Branchiopods from North Western Ghats, Maharashtra. *Streptocephalus dichotomus* was the most commonly observed species while newly recorded *Streptocephalus sahyadriensis* (Rogers and Padhye, 2014) could be considered as a more stenoecious taxon, with a highly restricted distribution and a specificity for rock pools.

## STUDY AREA
For present study two ponds were selected from Korigad hill plateau (Figure.1) which are part of Northern Western Ghats located in district Pune, Maharashtra.

**Korigad-** Two naturally formed ponds are located on this plateau (K1 and K2). These are present at an elevation of 2950 ft above the sea level (18°37'12.02" N 73°23'9.14" E). K1 is located on the northern side of the plateau which covers an area of about 30,000 sq. ft. From late winter, rapid evaporation starts exposing the top soil bed and total drying of water was observed during May. K2 is located north of K 1 and covers an area of about 25,000 sq. ft. Both these ponds are located adjacent to each other. Rain water is the only source of water in these ponds. In monsoon during heavy rain fall, mixing of water between these two ponds can be observed.

## MATERIAL AND METHODS
Samples were collected monthly throughout the study period from February 2013 to January 2014. For analysis of physico–chemical parameters, surface water samples were collected in early morning hours from all the selected water bodies in clean plastic carboys. The temperature and light penetration were recorded on the spot and samples for Dissolved Oxygen were fixed immediately in the field itself. Other water parameters were later analyzed in laboratory. Water analysis was performed as per the methods described in Standard Methods (APHA, 1998); Trivedi and Goel (1984).

For phytoplankton, 500 ml water sample was collected in separate container and for immediate fixation "Lugol's iodine solution" was used in the field and later "4% formaldehyde" was used for long term preservation. Standard keys Fritsch, (1979); Sarode and Kamat, (1984) and Bellinger, (1992) used for identification.

Zooplankton Samples were preserved using formalin and observed using microscope. Identification of fairy shrimp was done with the help of standard literature (Ward and Whipple, 1945; Pennak, 1953)

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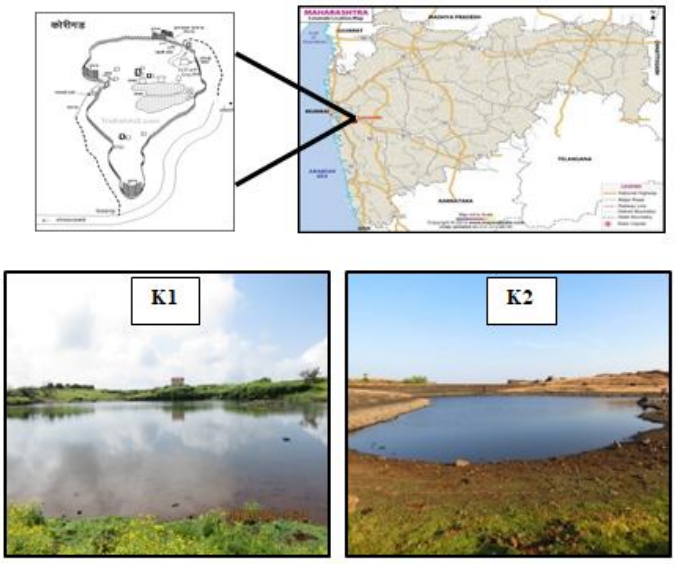


Study Area

**RESULT AND DISCUSSION**

During study Fairy shrimp *Streptocephalus spp* were observed. They appear as 1/2 to 1 1/2 inch crustaceans. Individuals grow quickly and can reach maturity in 18 to 60 days; maturation and reproduction rates of fairy shrimps are controlled by water temperature and can vary greatly. Average readings of physico-chemical parameters were given in Table 1. At Korigad ponds, Temperature showed significant negative correlation with density of shrimp larvae (Figure 1). Larval stages of fairy shrimps were observed from October to April while Adults were recorded in November to April in present study.

Brostoff *et al.* (2010) suggested that the fairy shrimp played little role in regulating primary production of the environment. . Large number of developmental stages of shrimp indicated prominent presence of females, which have better predatory role in the food web of these ponds of Korigad. Mixture of algae and rotifers provided effective combination as food for the shrimps as suggested by (Ali *et al.*, 1999) in their cyst production studies in the fairy shrimp *Streptocephalus proboscideus*. Feeding in Anostraca appears to be a nonselective and aimed at collecting algal, bacterial and detrital material (Cannon, 1935; Reeve, 1963; Fryer, 1983).

Bernice (1971) recorded 45% of rotifers in gut content of *Streptocephalus dichotomus*. Mertens *et al.* (1990) observed inverse relationship between rotifer population and abundance of *Streptocephalus*, suggesting probable predatory interaction. Selvarani (2009) commented that these shrimps can utilize the available food source in the habitat, not having any particular preferences. At Korigad, the abundance of fairy shrimps appeared to influence the structure of zooplankton community.

Fairy shrimp larvae were observed during summer and winter season at Korigad ponds showing maxima during month of February (Figure 2). Higher density of larvae were recorded at pond K1 as compared to K2 suggesting more favorable conditions at K1 for the growth of Fairy shrimp. Total phytoplankton and total rotifer density showed negative correlation with Fairy shrimp density suggesting inverse relationship between Fairy shrimp with algae and rotifer (Figure 1).

These vernal pool fairy shrimp are highly adapted to the environmental conditions of their ephemeral habitats and eggs remain dormant in pond soil when their habitats are dry, with onset of monsoon, the development begins again. There is need to protect these water bodies to conserve these specialist species.

Figure-3: Fairy Shrimp (Streptocephalus spp)

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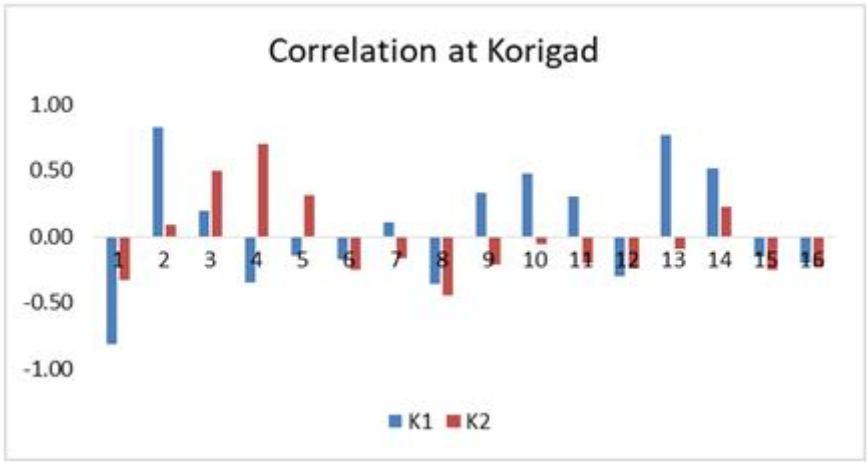
**Table-1*:* Average physico-chemical parameters at Korigad**

| Parameter | K1 | K2 |
|---|---|---|
| Water Temperature °C | 19.23 | 19.50 |
| pH | 7.16 | 7.23 |
| Light penetration (cm) | 75.82 | 74.00 |
| Total suspended solids (mg/L) | 652.73 | 673.33 |
| Conductivity (mS) | 0.17 | 0.19 |
| Free CO2 (mg/L) | 4.00 | 6.33 |
| Chlorides (mg/L) | 13.94 | 16.06 |
| Dissolved oxygen (mg/L) | 7.60 | 7.89 |
| Total alkalinity (mg/L) | 55.23 | 57.50 |
| Total Hardness (mg/L) | 28.33 | 32.30 |
| Calcium (mg/L) | 6.00 | 7.92 |
| Reactive Silica (mg/L) | 5.27 | 5.50 |
| Inorganic Phosphorus (mg/L) | 0.16 | 0.17 |
| Nitrate (mg/L) | 0.27 | 0.33 |

**Figure-1: Correlation matrix of Fairy shrimp with physico-chemical and biological parameters**

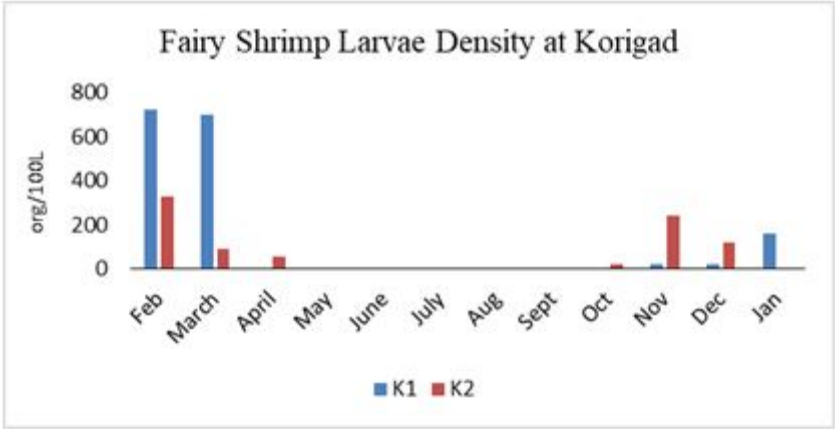



12-Reactive Silica 13-Inorganic Phosphorus 14-Nitrate 15-Total Phytoplankton 16-Total Rotifer

1-Water Temperature 2- pH 3-Light penetration 4-Total suspended solids 5-Conductivity

6-Free CO2 7-Chlorides 8-Dissolved oxygen 9-Total alkalinity 10-Total Hardness 11-Calcium

**Figure-2: Monthly variation of Fairy shrimp larvae density at Korigad ponds**



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# ANTHROPOGENIC IMPACT ASSESSMENT ON THE PRIMARY PRODUCTIVITY OF TWO FRESHWATER BODIES OF DOMBIVLI, (MAHARASHTRA, INDIA)

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## ABSTRACT
*Chole and Bhoirwadi lakes of Dombivli are under constant threat of anthropogenic activities. In the wake of this threat, an attempt was made to assess the anthropogenic effect on the primary productivity. The primary productivity of both lakes were evaluated from March 2014 to March 2015. There was no significant difference in primary productivity of both lakes. (Unpaired t-test, two tailed, $P \leq 0.05$). Community respiration (CR) of both lakes under investigation were found to be more than the net primary productivity (NPP) during certain months of winter thereby indicating the presence of organic pollution. No significant seasonal variation in primary productivity of Lake Chole was observed whereas significant seasonal variation was observed in gross and net primary productivity of Lake Bhoirwadi (ANOVA test at $P \leq 0.05$).*

*Keywords: Primary productivity, Net primary productivity, Gross primary productivity, Community respiration, Organic pollution*

## INTRODUCTION
The rate at which sun's energy is transformed in the organic form by photosynthetic and/or chemosynthetic activities of producers like plants and phytoplankton, is called primary productivity (Odum, 1971). The organic matter produced by the producers is used as food source by the producers themselves and later by the consumers (directly or indirectly). This primary productivity forms the base of all the metabolic activities in a given ecosystem. Aquatic ecosystem is no exception to it. Macrophytes and phytoplankton form the base of the aquatic food chain. Thus, primary productivity is an indispensable means for the assessment of suitability of an aquatic habitat for aquaculture.

Owing to central supply of water to urbanites, small lakes of urban area have been ripped off from their primary function of being source of potable water (Parasnis et al., 2009). Such lakes are subjected to anthropogenic activities. Deterioration of water quality, eutrophication, siltation of the lake, loss of biodiversity, disturbance of shoreline are some of the major consequences faced by urban lakes owing to anthropogenic activities (Reddy and Char, 2004; Kodarkar, 1995). Sustainable existence of such lakes can be ensured by using them for aquaculture. This will not only generate means of livelihood for the locals but will also safeguard urban lakes from cultural eutrophication.

Assessment of anthropogenic impact on primary productivity of lake will help in understanding that lake's efficiency in supporting aquaculture and will also assist in taking measures to make it suitable for aquaculture. With this view point, the present investigation was conducted.

## MATERIALS AND METHODS
Dombivli is a city of Thane district, Maharashtra (India). This city is well known for its high literacy rate, is a multicultural hub. Being urban, this city have very few lakes in its vicinity. Lake Chole (Geographical co-ordinates: 19013'18"N 7306'6"E; Area: 3230 sq. m) and Lake Bhoirwadi (Geographical co-ordinates: 19013'10"N 7306'40"E; Area: approximately 6000 sq. m) are two lakes falling under the 'F' ward of Dombivli, Kalyan Dombivli Municipal Corporation (KDMC). Common aspects of these two lakes are: (1) both receive water from two sources, namely, rainwater and natural aquifer, (2) both are situated near place of worship, and (3) are subjected to anthropogenic activities. Both the lakes are located amidst human habitation and are under tremendous pollution stress owing to various anthropogenic activities like immersion of idols, nirmalyas, cleaning, dumping of garbage, reception of domestic sewage, etc. Lake Chole is phytoplankton dominated water body. Macrophytes and phytoplankton are seen in Lakes Bhoirwadi.

Phytoplankton primary productivity and certain hydrobiological test was carried out from March 2014 to March 2015. Every month once, samples from each lake were collected from three different sites and the data was pooled for statistical analysis. Monthly data for primary productivity was collected by using light and dark bottle technique (Gaarder and Gran, 1917 as mentioned in Trivedy and Goel, 1984). The dissolved oxygen was analysed by Winkler's method with azide modification (APHA, 2005). For seasonal variations, the months were

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classified into various seasons in the following way: - Summer: - March, April, May & June 2014; Monsoon: - July, August, September & October 2014; Winter: - November, December 2014, January and February 2015.

The monthly data collected from three sites of each lake for every parameter analysed, are pooled and the resultant value is taken as the representative for that particular month. Mean, standard deviation, coefficient of correlation, ANOVA (Single factor), t-test (unpaired) were calculated using Microsoft Excel 2013. The same was also used for constructing bar and line graphs. ANOVA test was used to analyse seasonal variation observed in primary productivity of each lake were significant or not. t-test was used to find whether the difference observed in primary productivity of two lakes were significant or not.

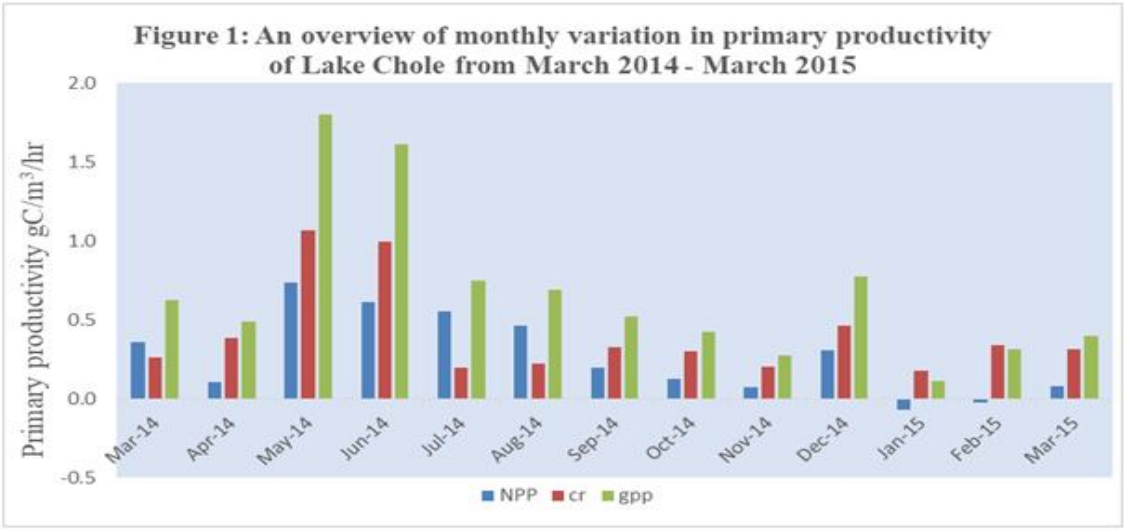
## RESULTS AND DISCUSSION

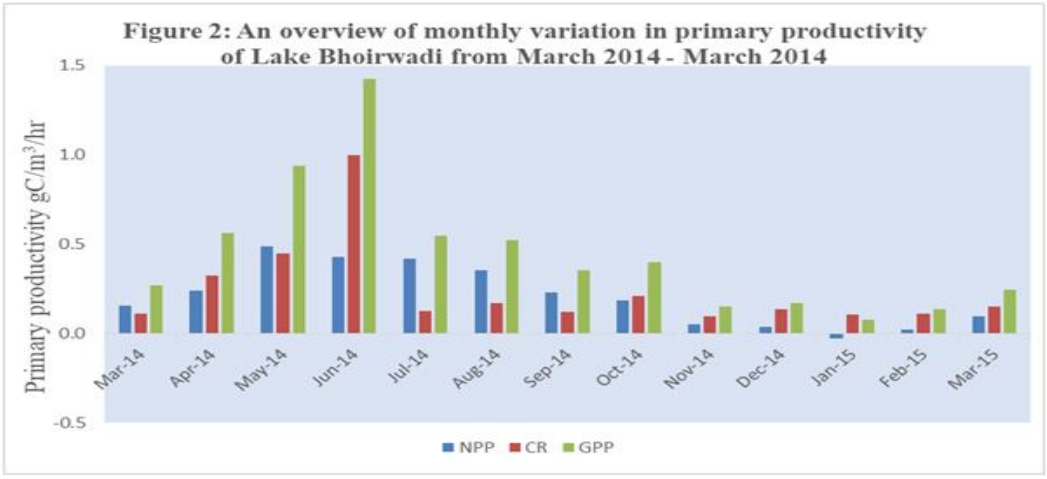
**Monthly variation:** Monthly variation in primary productivity of Chole and Bhoirwadi lakes are given in figure 1 and 2. Table 1 shows the results of unpaired t-test. The mean gross primary productivity (GPP) of Lake Chole was 0.68 ± 0.50 gC/$m^3$/hr with maxima of 1.80 gC/$m^3$/hr in May 2014 and minima of 0.11 gC/$m^3$/hr in January 2015. The mean GPP of Lake Bhoirwadi was 0.45 ± 0.38 gC/$m^3$/hr with maxima of 1.43 gC/$m^3$/hr in June 2014 and minima of 0.08 gC/$m^3$/hr in January 2015.

The mean NPP of Lake Bhoirwadi was 0.21 ± 0.17 gC/$m^3$/hr with maxima of 0.49 gC/$m^3$/hr in May 2014 and minima of -0.03 gC/$m^3$/hr in January 2015. The NPP % maxima of 76.71 % was noted in July 2014 and minima of -40 % in January 2015.

The mean CR of Lake Chole was 0.40 ± 0.29 gC/$m^3$/hr with maxima of 1.07 gC/$m^3$/hr in May 2014 and minima of 0.18 gC/$m^3$/hr in January 2015. The mean CR of Lake Bhoirwadi was 0.24 ± 0.25 gC/$m^3$/hr with maxima of 1.00 gC/$m^3$/hr in June 2014 and minima of 0.10 gC/$m^3$/hr in November 2014. The CR values of Lake Chole in January & February 2015 and of Lake Bhoirwadi in January 2015 were more than their respective GPP.

For most of the months during study period, the NPP, CR and GPP of Lake Chole were higher than that of Lake Bhoirwadi. These findings suggests of higher productivity in Lake Chole than that of Lake Bhoirwadi. But statistically, the difference in NPP, CR and GPP of the two lakes were insignificant.



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The NPP value of Lake Chole in January & February 2015 and in Lake Bhoirwadi during January 2015, was in negative. For these months in both lakes the CR was more than GPP, suggesting the dominance of Community Respiration (CR) over production. The DO of light bottles during these months was less than DO of initial bottles. The amount of organic carbon produced in photosynthesis by phytoplankton was less than the amount of organic carbon consumed for respiration by the community comprising of phytoplankton, zooplankton and other micro-organisms. In other words the community may not be completely dependent on photosynthesis for the source of organic carbon and also there may be presence of organic carbon / organic matter in both lakes – an indication of organic pollution (Trivedy and Goel, 1984). In the present investigation both lakes received organic waste throughout investigation duration.

**Table-1: Results of t-test (Unpaired; two tailed) at P ≤ 0.05**

| Sr.No. | Parameter | t-value | p-value | Inference |
|---|---|---|---|---|
| 1 | NPP | 0.762 | 0.453 | No Significant Difference |
| 2 | CR | 1.555 | 0.133 | No Significant Difference |
| 3 | GPP | 1.330 | 0.195 | No Significant Difference |

**Seasonal Variation:** Seasonal variation in primary productivity of Chole and Bhoirwadi lakes are given in figure 3. Table 2 shows the results of ANOVA test. The GPP maxima of 1.13 ± 0.67 $gC/m^3/hr$ in Lake Chole was observed during summer and minima of 0.37 ± 0.28 $gC/m^3/hr$ during winter. The same seasonal pattern was observed in Lake Bhoirwadi for GPP. The GPP maxima of 0.80 ± 0.50 $gC/m^3/hr$ was observed during summer and minima of 0.13 ± 0.04 $gC/m^3/hr$ during winter.

NPP maxima of 0.45 ± 0.28 $gC/m^3/hr$ in Lake Chole was observed during summer and minima of 0.07 ± 0.17 $gC/m^3/hr$ during winter. The NPP of Lake Bhoirwadi followed the same seasonal pattern as that of Lake Chole. The NPP maxima of 0.33 ± 0.16 $gC/m^3/hr$ was observed during summer and minima of 0.02 ± 0.04 $gC/m^3/hr$ during winter

The CR maxima of 0.68 ± 0.41 $gC/m^3/hr$ in Lake Chole was observed during summer and minima of 0.26 ± 0.06 $gC/m^3/hr$ during monsoon. The CR maxima of 0.47 ± 0.38 in Lake Bhoirwadi was observed during summer and minima of 0.11 ± 0.02 was observed during winter There was difference in the season for CR minima of both lakes.

**Table-2: Results of ANOVA test at P ≤ 0.05**

| | Lake Chole | | | Lake Bhoirwadi | | |
|---|---|---|---|---|---|---|
| **Parameter** | **F-value** | **P-value** | **Inference** | **F-value** | **P-value** | **Inference** |
| NPP | 3.0546 | 0.097 | No Significant Difference | 9.375 | 0.0063 | Significant Difference |
| CR | 3.308 | 0.083 | No Significant Difference | 3.154 | 0.091 | No Significant Difference |
| GPP | 3.312 | 0.0835 | No Significant Difference | 5.118 | 0.032 | Significant Difference |

The weed infested ponds of Kalyani, West Bengal (Paul *et al.*, 2006) and Prayatirth pond, Nashik, Maharashtra (Tidame and Shinde, 2012) also observed primary productivity maxima during summer and minima during winter season. The productivity minima during winter months may be due to inability of the algae and diatoms to utilise the accumulated nutrients in the lake sediment owing to low light intensity and temperature (Toman, 1996; Pugnetti & Bettinetti, 1999; Maheshwari *et al.*, 2015). The rise in temperature during summer months augment the release of nutrients from the sediment through the bacterial activity. Thus the high levels of nutrients and high temperature favour the growth of phytoplankton which finally leads to increase in primary productivity in summer months (Van Donk *et al.* 1993, Maheshwari *et al.*, 2015).

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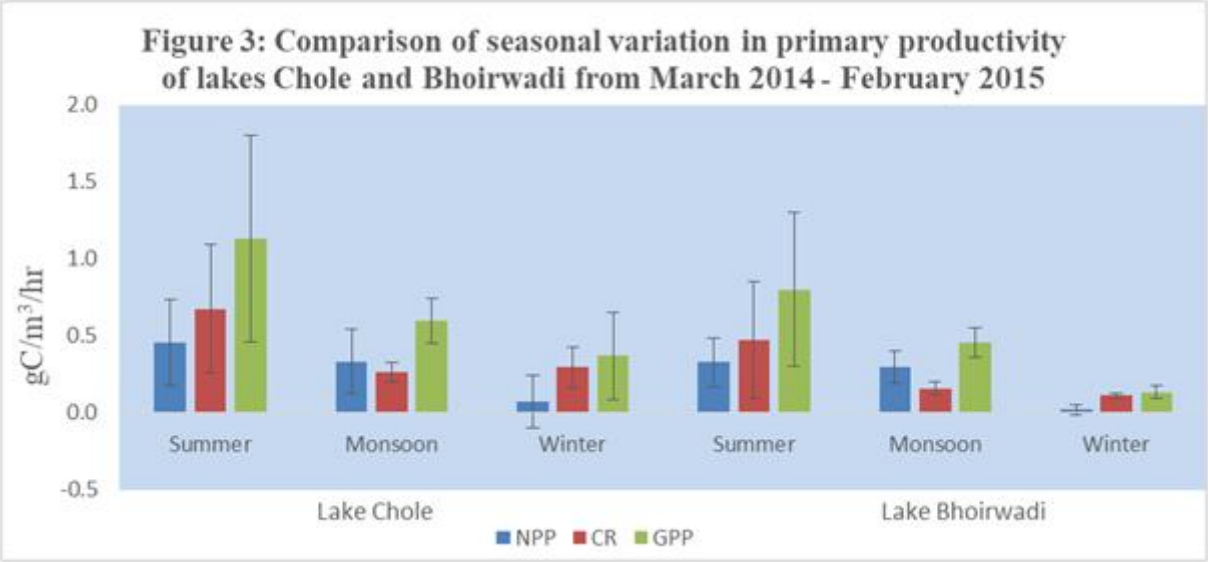


## CONCLUSION

The negative net primary productivity values of Chole and Bhoirwadi lakes during certain months of winter suggests the dominance of community respiration over production – sign of an impaired primary productivity. This also indicates the use of allochthonous organic carbon by the community for respiration, in turn indirectly giving the evidence of presence of organic pollution. Impaired primary productivity is an indication of both lakes under investigation are unsuitable for aquaculture. There is need of suitable measures to overcome organic pollution of lakes Chole and Bhoirwadi and making it suitable for aquaculture practices.

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# ANTIOXIDATIVE ENZYME IN *MUGIL CEPHALUS* AS A BIOINDICATORS FOR AQUATIC METAL POLLUTION

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## ABSTRACT
*Metals act as an inducer of generating Reactive oxygen species (ROS) which cause oxidative stress in marine fish. Most of the Antioxidant enzymes are sensitive and respond differently towards accumulating metals in different organs of fish. These studies aim at assessing the effect of accumulated metals on the activities of antioxidant enzymes like superoxide dismutase (SOD) and Catalase (CAT) in the different organs like muscle and liver of fish from the natural aquatic environment. Assessment of accumulated heavy metals from tissues was carried out using Inductively Coupled Plasma –Atomic Emission Spectroscopy (ICP-AES) and Inductively Coupled Plasma Mass Spectroscopy ICP-MS. The antioxidant activity of metalloenzyme like the one SOD was measured based on its inhibition of reduction of Nitro blue tetrazolium using a spectrophotometric assay. Whereas CAT activity was measured by a decrease in the absorption of hydrogen peroxide with time before and after decomposition by it at 240nm. The result of this study considers SOD and CAT as a sensitive bio indicator of oxidative stress caused by accumulated metals.*

*Keywords: Metals, ROS, Oxidative stress, ICP-AES, ICP-MS, SOD, CAT*

## INTRODUCTION
Aquatic metal pollution is mostly caused due to untreated sewage; agricultural runoff along with pesticides and herbicides, effluent discharges from metal, processing and manufacturing industries is dumped into the aquatic ecosystem (Sanchez, Palluel, & Meunier, 2005). (Batista, et al., 2014). Heavy metal like Fe, Cu, Zn & Mn from marine water has the tendency to bio accumulated in the marine organism and can cause oxidative stress by generating highly reactive oxygen species (ROS), such as superoxide radical, hydroxyl radical and hydrogen peroxide which often cause damage to cell structure or cell death which can be revealed by studies using light microscopy and scanning electron microscopy. Accumulation of metal in different organ at different concentration depends on the route of exposure to metal and may show different activity of metallo enzymes i.e CAT and SOD (Mahurpawar, 2015) (Pandey, et al., 2008) (Farombi, Adelowo, & Ajimoko, 2007) (Vieira, Gravato, Soares, Morgado, & Guilhermino, 2009). To combat with this oxidative stress and metal poising, antioxidant enzymes like superoxide dismutase (SOD) and Catalase (CAT) provide antioxidant defence system (ADO) against reactive oxidative species (ROS) within organism and plays an important role to cope with free radical in several ways (Atli & Canli, 2010) (Jackim, Hamlin, & Sonis, 1970) (Hansen, Romma, Garmo, Olsvik, & Andersen, 2006). SOD and antioxidant enzyme catalyse the reduction of superoxide radical into hydrogen peroxide, where CAT eliminates hydrogen peroxide a non-radical oxygen species that can cause tissue damage and can inactivate enzymes. CAT mostly get stimulated by most of the metals like Cd, Zn, Cu & Cr and there is a sharp decrease in the activity of CAT by Ag accumulation (Atli, Alptekin, Tukel, & canli, 2006). Liver and kidney are the main organ endowed with antioxidant defence system consisting of the antioxidant enzymes which protect these organs with oxidative stress and prevent this organs from damage (Jorgensen , 2010) (Kanak, Dogan, Eroglu, & Atli, 2014).

SOD are of three types depend on their active metals sites : copper and zinc (Cu/Zn-SOD) has ligands for copper and zinc, which are six histidine and one aspartate side-chain; one histidine is bound between the two metals, Manganese (Mn-SOD) and Iron (Fe-SOD) mostly in eukaryotes (Petkar, Pillai, Kulkarni, Bondre, & Roa, 2013) whereas CAT contain four iron- containing heme group that allow the enzyme to react with the hydrogen peroxide therefore this enzyme are also considered as metalloenzymes (Tainer, Getzoff, Richardson, & Richardson, 1983).

This research sheds light on the activity of antioxidant enzymes CAT and SOD in *Mugil cephalus*, which are influenced by the accumulated heavy metals due the metal pollution in aquatic environments. The accumulated metals from different organs of *Mugil cephalus* here estimated by Inductively Coupled Plasma-Atomic Emission spectrometry (ICP-AES) and Inductively Coupled Plasma- Mass spectrometry (ICP-MS) and enzyme activity of antioxidant and metallo enzymes like CAT and SOD were measured. Enzyme activities are considered as sensitive biochemical indicators of oxidative stress due to metal accumulation, hence they can consider as biomarkers for oxidative stress and metal pollution in aquatic environments.

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## MATERIAL AND METHODS

### Estimation of Metal by ICP-AES and ICP-MS in fish tissues

Commercially significant fish *Mugil cephalus* were selected for the experiment and were collected from Sassoon Dock station by various fishing methods by local fishermen. Six fish sample from each six fish catch were collected. The specimens were stored in an ice box and transported to the laboratory. Total length (cm) and weight (g) were measure before dissection table.1. Organs from the fish were dissected out and acid digestion of organs like Liver and the muscle were carried out using conc. $HNO_3$ and conc. $HClO_4$ and sample after digestion was filtered using membrane syringe filter of 25MM (TARSONS SYRINGE FILTER 25 MM (PSF) LOT No. A020216, product no.521090). TDS was adjusted with digital TDS meter (HM Digital Aquapro water tester TDS Meter). Heavy metals analysis for Zn, Cu, Mn was carried out from digested sample using ICP-AES (Model-ARCOS (simultaneous ICP Spectrometer)).

**Table-1: Total weight, length and width of *Mugil cephalus* from Sassoon Dock**

| Fish | Sample No. | Total weight Average (g) | Total length (cm) | Total Width (cm) | Habitat | Station |
|---|---|---|---|---|---|---|
| ***Mugil cephalus*** | 6 | 68.65 | 18 | 3-4 | Diurnal coastal, estuaries, rivers and mud bottoms | Sassoon Dock |
| | 6 | 79.98 | 20 | 3-5 | | |
| | 6 | 78.39 | 20 | 3-4 | | |
| | 6 | 84 | 20.5 | 3-6 | | |
| | 6 | 74.73 | 19.5 | 4 | | |
| | 6 | 81.43 | 20 | 4.3 | | |

### Production of homogenates

*Mugil cephalus* from Sassoon dock were collected, liver and muscle was dissected. 5% homogenate were prepared in 0.25 M sucrose in phosphate buffer of pH 7.6 and store in deep freezer and further used for enzyme assay.

**Catalase Activity** (Luck, 1974) **.**

Catalase enzyme assay was carried out using 50 mM potassium phosphate buffer pH 7.6, 0.036% (w/w) Hydrogen peroxide solution as substrate where used with absorbance of 0.550 to 0.520 at λ max 240nm. The reaction started by adding enzyme extract to mixture. The decomposition of hydrogen peroxide by catalase result in decrease in absorption with time and time were recorded for the decrease in absorbance. Catalase activity were calculated in U/ml i.e one unit will decompose 1 µ mole of $H_2O_2$ per minute at pH 7 at 25 °C, while the $H_2O_2$ concentration falls from 10.3 mM to 9.2 mM. The rate of disappearance of $H_2O_2$ was followed by observing the rate of decrease in the absorbance at 240 nm.

### Superoxide Dismutase

Super oxide radical scavenging modified assay (Madamanchi, Donahue, Cramer, Alscher, & Pedersen, 1994)

In modified assay for SOD using 0.1M Phosphate buffer (pH 7.8), 65mM methionine, 750 uM nitroblue tetrazolium, 0.2 mM riboflavin, 0.001 mM EDTA and enzyme extract. Reaction were initiated after the addition of enzyme and riboflavin and were incubated under tube light source for 15 mins. Second sets of tubes was kept in dark as control. And absorbance was measured at 560 nm. One unit of enzyme activity is defined as the amount of SOD capable of inhibiting 50% of nitrite formation under assay conditions.

## RESULTS

### Catalase Activity

The Cu and Zn content is highest in the Liver i.e 1.26 & 3.91µg/g at the same time Activity of CAT was also found to high at 160 U/ml in liver and 17.25 U/ml in Muscle of *Mugil cephalus* for respective Conc. of Cu & Zn i.e 0.08 and 0.49 µg/g. The lowest accumulation was found in the muscle of Cu & Zn i.e 0.03 & 0.12 µg/g respectively, which also corresponds to lower activity of CAT in respective Conc. i.e 6.9 & 6.9 U/ml respectively. Table 2 and Fig 1 & 2

**Table-2: CAT enzyme activity U/ml and content of Metal µg/g in the Liver and Muscle in Mugil cephalus form Sassoon Dock**

| | Liver CAT U/ml | Cu µg/g | Zn µg/g | Muscle CAT U/ml | Cu µg/g | Zn µg/g |
|---|---|---|---|---|---|---|
| **CAT** | 35.6 | 0.5 | 1.5 | 6.9 | 0.05 | 0.2 |
| **U/ml enzyme** | 151.6 | 1.21 | 3.52 | 6.9 | 0.03 | 0.21 |

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| | | | | | | |
|---|---|---|---|---|---|---|
| | 69.0 | 0.9 | 2.1 | 8.625 | 0.06 | 0.32 |
| | 138.0 | 1 | 2.6 | 6.9 | 0.04 | 0.12 |
| | 160.5 | 1.26 | 3.91 | 6.9 | 0.04 | 0.25 |
| | 46.0 | 0.8 | 1.8 | 17.25 | 0.08 | 0.49 |

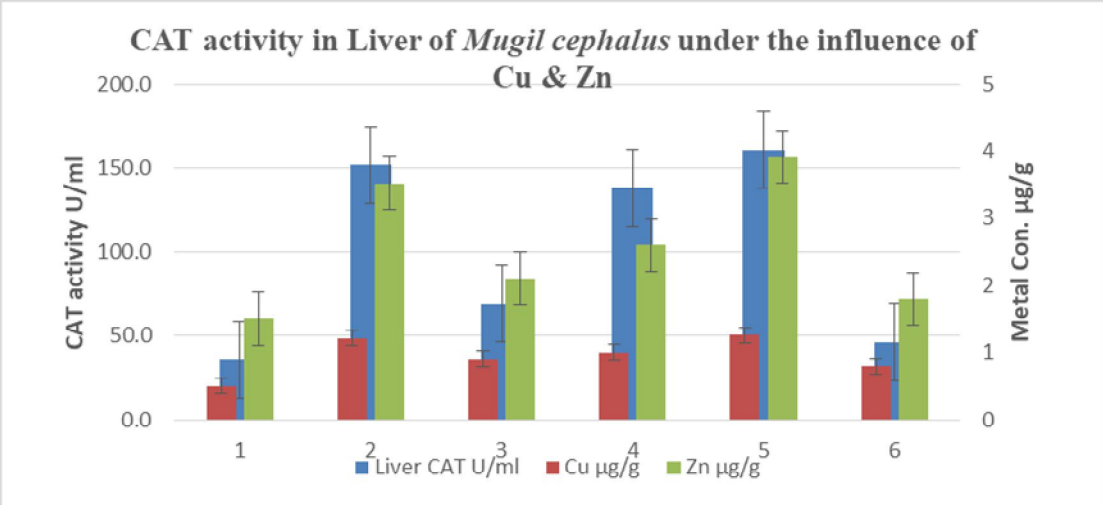


Fig-1: CAT activity U/ml in the liver of *Mugil cephalus* under the influence of Cu & Zn µg/g from Sassoon Dock

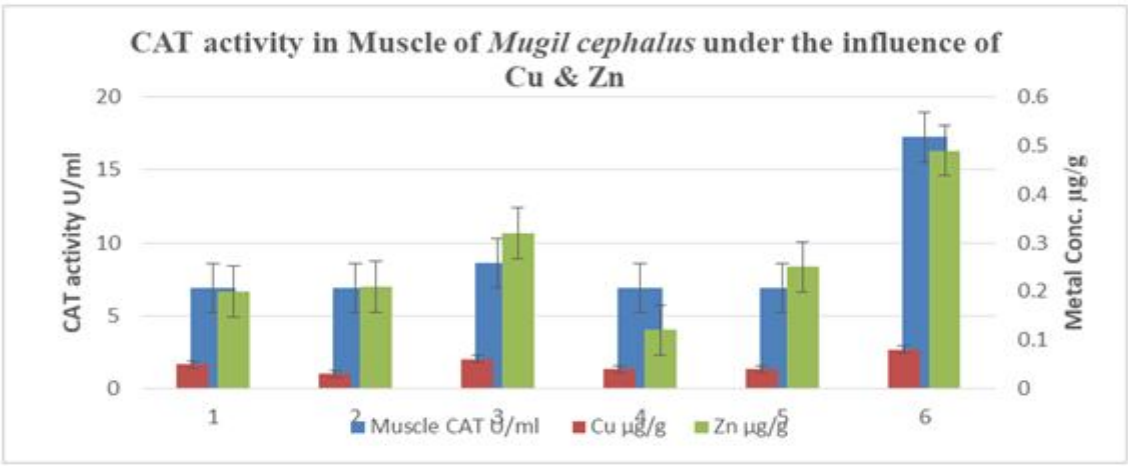


Fig-2: Catalase activity in Muscles of Mugil cephalus under the influence of Cu &Zn µg/g from Sassoon Dock

**Super oxide dismutase Activity**

The Cu, Zn and Mn content are highest in the Liver i.e. 1.21, 3.91 and 0.55 µg/g at the same time Activity of SOD was also found to be high at 5.35 U/ml in liver and 5.06 U/ml in Muscle of *Mugil cephalus* for respective Conc. of Cu, Zn & Mn i.e. 0.05, 0.2 & 0.15 µg/g. The lowest accumulation of Cu, Zn & Mn was found in the muscle i.e. 0.03, 0.12 & 0.09 µg/g, respectively, but it did not correspond to lower activity of SOD in respective coins. i.e. 3.30 U/ml for Cu metal whereas SOD activity was lowest with respective to lower concentration of Zn and Mn in the muscle of *Mugil cephalus*.Table No.3 Fig 3 & 4.

**Table-3: SOD enzyme activity U/ml and content of Metal µg/g in the Liver and Muscle of *Mugil cephalus* from Sassoon Dock**

| SOD Activity | Liver SOD U/ml | Liver Cu µg/g | Liver Zn µg/g | Liver Mn µg/g | Muscle SOD U/ml | Muscle Cu µg/g | Muscle Zn µg/g | Muscle Mn µg/g |
|---|---|---|---|---|---|---|---|---|
| | 3.00 | 0.5 | 1.5 | 0.12 | 5.06 | 0.05 | 0.2 | 0.15 |
| | 5.35 | 1.21 | 3.91 | 0.55 | 3.30 | 0.03 | 0.21 | 0.1 |
| SOD | 4.50 | 0.9 | 2.1 | 0.3 | 2.50 | 0.06 | 0.32 | 0.13 |
| U/ml enzyme | 2.00 | 1 | 2.6 | 0.32 | 1.70 | 0.04 | 0.12 | 0.09 |
| | 4.90 | 1.16 | 3.52 | 0.42 | 1.50 | 0.04 | 0.25 | 0.12 |
| | 5.24 | 0.8 | 1.8 | 0.45 | 4.94 | 0.08 | 0.3 | 0.49 |

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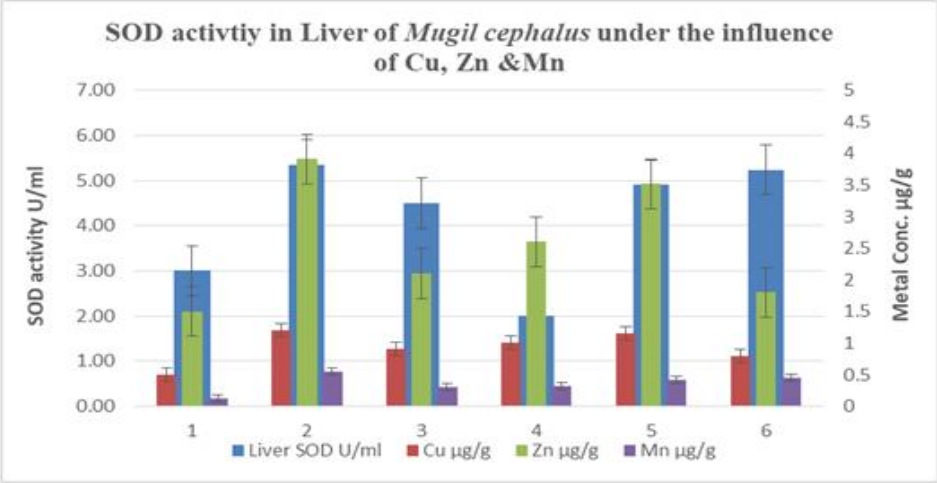


Fig-3: SOD activity in Muscles of *Mugil cephalus* under the influence of Cu, Zn & Mn µg/g from Sassoon Dock

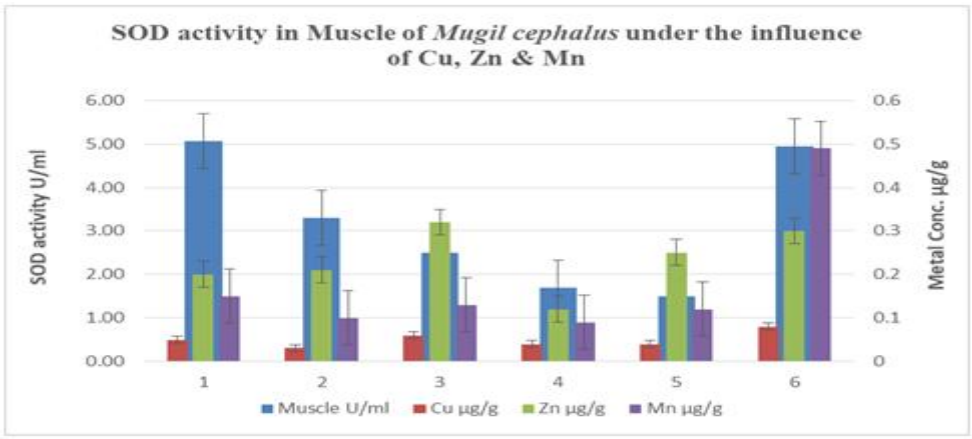


Fig-4: SOD activity in Muscles of Mugil cephalus under the influence of Cu, Zn & Mn µg/g from Sassoon Dock

**CONCLUSION**

This work is on SOD and CAT in the population of *Mugil cephalus* with different concentration of heavy metal accumulation in the liver and the muscle from Sassoon Dock. The highest concentration of metal was found in the liver i.e of Zn 3.91 µg/g, Cu i.e 1.26 µg/g followed by Mn 0.12 µg/g. Where as the lowest concentration of metal was found in the muscle i.e Cu 0.03 µg/g followed by Mn i.e. 0.09 µg/g and Zn i.e. 0.12 µg/g.Table no.2 & 3. Liver show highest accumulation of most of heavy metals in it (Malik, Biswas, Qureshi, Borana, & Virha, 2010).

Bioaccumulation of this metal in the organs of *Mugil cephalus* have thought to produce oxidative stress in the organs of fish and to combat with this oxidative stress, antioxidative enzymes like SOD and CAT provide a defense mechanism against reactive oxidative species (ROS) within the tissues of fish and plays an important role to cope with free radicals in several ways. Exposure to tissues to heavy metals increases SOD and CAT activity to cope up with stress condition. Research on it has also suggested that increased activity of SOD and CAT can be a warning sign of oxidative stress and tissue damage hence SOD and CAT activity may be considered as a sensitive bio indicator for the antioxidant defence system due to oxidative stress caused due to metal pollutants (Atli, Alptekin, Tukel, & canli, 2006).

In this study response of CAT activity and SOD activity in different tissues, i.e. the liver and the muscle with respect to bio accumulated metals like. Cu, Mn and Zn were studied. Bioaccumulation of metals in the tissue of *Mugil chephalus* is the main concerned, which indicated metal pollution in the aquatic environment. In addition, to monitor metal toxicity CAT and SOD activity were considered as a sensitive biomarker for aquatic metal pollution. (Farombi, Adelowo, & Ajimoko, 2007)

The results of this study show significant elevation in the activity of CAT and SOD in the liver i.e. 160 U/ml and 5.35 U/ml, respectively, with corresponding high accumulation of metals like Cu, Zn and Mn i.e. 1.26, 3.91 and 0.55 ug/g. Due to accumulation of metals in the tissue had led to oxidative stress, which has increased in activity of CAT and SOD in liver of *Mugil chephalus*. Whereas the activity of CAT and SOD in the muscle i.e

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17.25 U/ml and 5.06 U/ml increased with respective to increase in the concentration of accumulated metals in the muscles i.e. Cu 0.08 ug/g, Zn 0.49 ug/g. The lowest accumulation was found in the muscle of Cu & Zn i.e 0.03 & 0.12 µg/g respectively, which also corresponds to lower activity of CAT in respective Conc. i.e 6.9 & 6.9 U/ml. Table 2 and Fig 1 & 2. The lowest accumulation of Cu, Zn & Mn was found in the muscle i.e. 0.03, 0.12 & 0.09 µg/g, respectively, but lowest Cu conc. i.e. 0.03 µg/g did not correspond to lower activity of SOD i.e. 3.30 U/ml, whereas SOD activity was lowest with respective to lower conc. of Zn and Mn in the muscle of *Mugil cephalus.*Table No.3 Fig 3 & 4. Therefore, it can be concluded that the lowest concentration of Cu is enough to increase the activity of SOD by increasing oxidative stress in the tissue of *Mugil cephalus* from Sassoon Dock.

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# PRESENT STATUS OF TRADITIONAL BIVALVE HARVESTING IN SELECTED CREEKS OF DEVGAD TEHSIL WITH REFERENCE TO NATURAL SUSTAINABILITY OF CROP ANIMALS

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## ABSTRACT
*Traditional bivalve harvesting is a regular orthodox business of several fishermen families in coastal part of Devgad Tehsil in Sindhudurg district. The harvesting of bivalve is done mainly for the sell in nearby markets and then for own domestic food. Exporting of the harvested animals is not done to far places beyond 50km from the place. It is due to lack of proper harvesting techniques, collection and preservation and marketing. Besides, the availability of the animals is mainly restricted to some creek ecosystems; enriched with mangrove coastal lines and which are naturally endowed by resources including breeding grounds for such animals. But still there is no proper strategies followed by the local people harvesting bivalves from their resources or they do not have any proper knowledge of the natural processes about population dynamics of these animals. Concerned Studies done in Wadatar-Malai creek and Mithbav creek in last three years have shown that there are some unique species of bivalves occurring on these coasts only along with many other common edible bivalves. The local people harvest the animals from the month March to May. But the quantitative as well as qualitative aspects of the crop are not matching all the time throughout the season. Besides, there is no any certainty of the crop every year. In both the creeks, it has been detected that some species occur even years after. Hence harvesting of the bivalves on commercial basis has not yet been a full time business of the local people. It is a side business or time-based business. But with the implementation of proper culture methods and concerned caretaking of the crop, a good yield can be obtained as basins of both the creeks are well enriched with the nutrient resources and proper breeding grounds with less eco-biological threats like pollution. It is a need of time to achieve a constancy in the population of the bivalves in the creek ecosystems under study to achieve a sustainable stability in the crop.*

*Keywords: Devgad, Wadatar-Malai, Mithbav, edible bivalves, harvesting techniques.*

## A] INTRODUCTION
Sindhudurg district of South Konkan is well known tourism district in the Maharashtra State and also known as Malabar. It is located on 16°4' N to 16° 8' N and 73°8' E to 74°E. The tehsil Devgad selected for proposed studies lies on geographical coordinates as 16° 23' 0" N., 73° 23' 0" E.

South Konkan is well known for its terrestrial as well as marine biodiversity. It is a coast with a natural length of 121km providing food and money to several people residing over there since long times. Devgad Tehsil in Sindhudurg district is one of the important naturally endowed zones in that coastal length. It has partially fragmented but significantly long coastal lines. Those coastal lines represent several naturally endowed creeks. Most of the creeks are fortunately still away from major human nuisance and the consequent eco-biological damages. The selected creeks of Devgad Tehsil lie in such undisturbed zones. Obviously, they have their own characteristic habitat structure and microenvironment flourishing a large biodiversity in their basins. Molluscan diversity in the premises of those creeks has a very good species richness as well as abundance.

Hence to detect the overall abundance of edible molluscan diversity, their harvesting processes and the some ideas of conservation and sustainable development of the crop, a comparative study of two selected creeks Wadatar-Malai and Mithbav from the tehsil was carried out during a period of two and half years from May 2013 to October 2015. The study included identification of the species, interviews and discussions with the local catchers depending on them, population analysis by quadrate method and biomass index wherever possible and comparative analysis of the observations. Interesting results have been obtained with respect to these parameters if the overall environmental parameters and seasonal changes are concerned. Occurrence and abundance of the observed species differs in the selected habitats. Some molluscan species were found only on one shore and not on the other while some were common on both with differing population densities. Molluscan diversity here is refereed to all classes of the phylum. But as the studies were mainly confined to edible molluscs, only bivalves were obviously focused.

It has been recently estimated that the overall business of edible bivalves in the selected creeks runs in lakhs in the local markets per year depending on the season. The catch is actually related with some very vital environmental factors like movement of sand under the bottom, speed of tides, period of occurrence of high and low tides, nutritional fluctuations, exposure to sunlight and mangrove thickness on the coastal lines.

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**B] OBJECTIVE**

1] Selection of the creeks significantly known for varied molluscan diversity and related harvesting process.

2] Visits to the study areas during the times of harvest by local people

3] Interviews with local catchers

4] Overall estimation of the catch

5] Culture practices run by local Mahila Bachat Gat and UNDP.

**C] MATERIAL AND METHODS:**

**a] Study area**

1] For the proposed study, two creeks were selected for the purpose. They are known as **Wadatar-Malai** creek and **Mithbav** creek.

**Wadatar-Malai creek** is nearly 8 km away from the Devgad town in its North and North-West. This creek is having a rocky-muddy mixed shore habitat with considerably wide mudflat extending inward from both of its shores. It has very thick mangrove vegetation on the outskirts of its both shores. It has long mangrove thickets along its coastal line as well as small mangrove islets in its midstream. The width of the stream extends upto more than 100 meters. The midstream mangrove islets are also considerably thick and away from easy reach of mankind. It must also be noted that the overall water volume in the main stream of the creek remains ample irrespective of the tidal cycle as on its immediate West mouth, it opens in the Arabian Sea. Major part of its deep mud flats on its shores becomes completely bare during low tides. The creek has a considerable length of almost 6 km on its both coasts. The natural habitat of the creek is thus favourable for harbouring a large number of shallow water animals like molluscs, other invertebrates and fishes.

**Mithbav creek** is at a distance of 25 km in the South-East of Devgad. This creek is also having a mixed rocky-muddy habitat. The basin of the creek is actually a mixture of mud and sand. Both the components are almost equal in their quantity. But at some places, the substratum is perfectly muddy while at some place it is sandy only. Mangrove thickets are observed on both the shores. Here also the mangrove cover is very thick and continuous at all places. It is scattered at few places and even observed around the human houses. The total length of Mithbav creek is almost 15 km from its origin. It is actually an extension of Aarey River originating from Aarey Village in Devgad Tehsil. Mithbav creek due to its longer journey of 15km, its fluctuating basin composition at places and human activities on the shore has been observed to be the richest in its biodiversity as compared to any of the creeks in Devgad Tehsil.

**b] Methods**

Methods used for the study mainly included handy collections during low tides, interactions with the local people, identification of the collected specimens with the proper keys available at hand. Quadrate method for measurement of population density was carried out wherever possible. Biomass index has also been specifically done approximately where it was possible to do so. But quadrating and biomass index was not strictly followed everywhere and every time.

**C] OBSERVATIONS AND DISCUSSION**

**The results obtained can be summarized as follows**

**1]** Main clams species observed in the premises of both the creeks belong to 12 different species. They are *Katelysia opima, Paphia malabarica, Paphia ala-papilions, Placenta placenta, Meretrix meretrix, Meretrix casta,, Katelysia opima, Donax cuneatus, Solen kempi, Gafrarium tumidum, Cardium asiaticum, Perna viridis, Gelonia proxima, Placuna placenta* and *Soletellina violacea*.

Of them, *Paphia malabarica, Meretrix meretrix, Meretrix casta* and *Katelysia opima* are the main species of commercial importance as they are harvested most and used as popular edible species. All these four species are not available during the period from July to October every year due to low salinity of the waters. *Katelysia opima* is not found till the end of November. But otherwise they are available in the other months of the year. They are specifically observed in the mud-flat substratum burrowing under a depth of 2-3 feet or among the pebbles and gravels. The catchers sense them with their thumbs of legs and pick up them easily just by their hands.

*Soletellina violacea* is another species which is also observed among both the creeks and is observed throughout the year. It is a species mainly restricted to soft muddy substratum without any pebbles or gravels. The animals are usually located with the circular holes made by the animal itself in the soft mud. In Mithbav, the catchers collect it by digging the mud while on Wadatar-Malai creek, they collect it by putting a long metal wire with a

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broad end, through the hole which is hold tightly by the animal. It is done specifically to avoid the probability of sharp cuts on the body of the catcher due to sharp edges of the shells.

This species was first time recorded by Dr. S. G. Yeragi in 1979 in Mithbav creek and then its biology was also worked out by him.

**2]** Main oyster varieties found among both the creek ecosystems are *Saccostrea cuculata;* also named as *Crassostrea cattuckensis, Saxostrea cuculata, Crassostrea madrasensis and Crassostrea gryphoides*. Cuculata species remain attached in clusters to the rocks in the intertidal zone of the creeks and hence are known as rock oysters. The species *Crassostrea madrasensis* is usually found under water in the sublittoral zone and hence it is specifically collected by dipping under water. The varieties *Saxostrea cuculata* and *Crassostrea cattuckensis* are the common residents of mangrove belts and observed throughout the year. Therefore the local people use it for commercial as well as their day to day purpose. *Crassostrea cattuckensis* and *Saxostrea cuculata* have been recorded to have a life span of 18 months while that of *Crassostrea madrasensis* has been recorded to be 5-6 years. It is a larger shell with very thick shell and a good amount of flesh.

Interesting observation obtained by interacting with the local regular collectors of the bivalves was that the bivalves of the species *Katelysia opima, Meretrix meretrix, Paphia ala-papilions* and *Crassostrea cucullata* were obtained on a large scale after almost a long period of 09 years. They were not at all obtained during that period so that at least some commercial benefits would have been drawn by some families at local level. But it is quite natural if the biological reason is concerned. It is related to the continuous changes in the micro-environmental factors of the substratum and the water such as salinity and pH. These factors affect the overall reproductive behavior of the molluscan animals residing over there. Besides if catch strategy and mentality of the local people is concerned, it has been seen that even very younger pre-reproductive animals are also collected without any future thoughts, so as to get maximum commercial returns. Thus there remains a very less scope for the origin of next generation. It has been observed that during low tide period almost 300-400 people including women and even small children above the age of just eight years are involved in the collection process. They collect the animals by the traditional methods by touching and sensing the animal under the mud by their toes; mainly the thumbs. As they get the familiar touch of the animal, they just bend down and collect it into the container. There is an unwritten or hidden competition for collection going on among the collectors even right from 3.00 O'clock in the early mornings during maximum low tides extending upto even 8 O'clock in the morning till the high tides start their session and reach upto their chests. Most of the involved persons are good swimmers and the force of tides is not that much fearful initially in the creek. This practice continues throughout all the days of low tides during the months. The practices are committed to be stopped only during the four months of rains i.e. from June to September. It has been also observed that each person involved in the catching process collects at least 10kg biomass of all the types of edible oysters per day at an average. It means approximately 3000kg of the edible oyster catch/day is done just on the shores of a single creek in the tehsil. Just from this extent of figures, we can understand that the people leave no scope for the animals to grow, to reach sexual maturity and to breed so as to produce their next generation. Environmental fluctuations are of minimum significance if the random over-exploitation of the animals by local people is concerned. In addition to that there is absolutely no domestic or industrial pollution in the substratum or water due to lack of any industry as well as less population density on the shores. People collect their solid wastes near their individual homes and just burn them. Many houses have their own septic tanks and their bathroom water is obviously irrigated and soaked in the typical Konkan trees plantations around the houses. Hence there is no scope for such waters to get into the sea.

The species which are not of much commercial significance like *Placenta placenta* [Windowpane oyster] grow to their full maximum size and have a considerable thicker population density overthere. Gastropods are also found in masses with thick densities and are completely ignored due to their very small size, non-nutritional value and hence are not commercially significant.

The other common species which is harvested from both the creeks on individual as well as commercial basis is Common Green Mytilus [*Perna viridis*]. But it is restricted to only the few rocky bracelets of the shores and is less abundant.

As discussed earlier, the commercial business of all these bivalves ranges in certain lakhs every year. But the crop is not certain as it is nature dependent. Hence artificial aquacultural practices of *Cassostrea madrasensis* were conducted in the premises of Wadatar-Malai creek by a "Prasiddhi Mahila Bachaat Gat" consisting 10 women from local families existing in that village. That Mahila Gat has been produced by UNDP in 2014. Even the culture plant developed in the mangrove thickets of the creek has also been financially supported by UNDP.

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It is a pilot project run by the same. The plant has become quite much successful as the very first harvesting done few days ago after 1.5 years of its implementation has led to a good total production with significant larger size of the animals than it is in natural conditions. The overall taste of the cultured animals has been found to be not much fluctuating from that of the natural animals. The project has been run to produce a general awareness among the local people about the need of controlled harvesting and sustainable maintenance of the crop animals in their natural habitats so as to get consistent crop every year and to prevent any overexploitation of the ecosystem.

**E] ACKNOWLEDGEMENTS**
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# INTELLIGENT COLLISION DETECTION AND AVOIDANCE SYSTEM ON AERIAL WORK PLATFORMS

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**ABSTRACT**
*Many a times we encounter life threatening accidents involving cranes (aerial work platform) at locations such as construction sites. Severe accidents occur due to collisions of the crane with obstacles like tress, buildings and while transporting objects from one place to another. Hence safety is a priority. This project proposes an intelligent collision avoidance system mounted on an arm. It is made up of a servo motor placed on the arm and it rotates the Ultrasonic sensor from 0 to 180 degrees. Ultrasonic sensor is used to measure the distance between an obstacle and crane. The overall system is controlled by ARDUINO. A Graphical representation of the data from the Ultrasonic Sensor is represented in a Radar type display with the help of Processing IDE which is placed in front of the operator. If the Ultrasonic Sensor detects any object within its range, the same will be displayed graphically on the screen, thus helping the operator to know the distance between the crane and the obstacle. If the distance is less than a fixed threshold, the crane movement stops completely to avoid collision. The project thus prevents collisions and ensures safety of personnel and equipment.*

*Keywords: Arduino, ultra-sonic, radar, obstacle detection*

## 1. INTRODUCTION

RADAR system is an object detection or tracking system which uses radio waves to decide or get the range, height, heading, or speed of items or objects. Military uses were once the only applications for radar technology, but times have changed. Radar technology is now finding uses in many commercial, industrial, medical, weather, and especially automotive systems.Our proposed system's working principle is linked by the following components which is ultra-sonic sensor connected to the microcontroller's (we have chosen Arduino) digital input and output pins. Then we have servo motor which is also connected to digital output and input pins. Our both main components ultra-sonic sensor and servo motor are connected simultaneously, so that when our servo motor rotates from 0 degree to 180 degree from extreme right to extreme left the motor will rotate nearby its axis. We utilize Computer screen to demonstrate the data through software called "Processing IDE"

The construction industry is naturally one with many hazards because of having to work at tall heights, do heavy lifting, operate or work around heavy vehicles and working in an environment where there are many things being moved around such as wheelbarrows, timber and bricks which one could potentially trip over.In fact, one in five workplace fatalities are construction-related.The top causes of constructionrelated fatalities are falls, struck-by an object, electrocution and caught between objects.

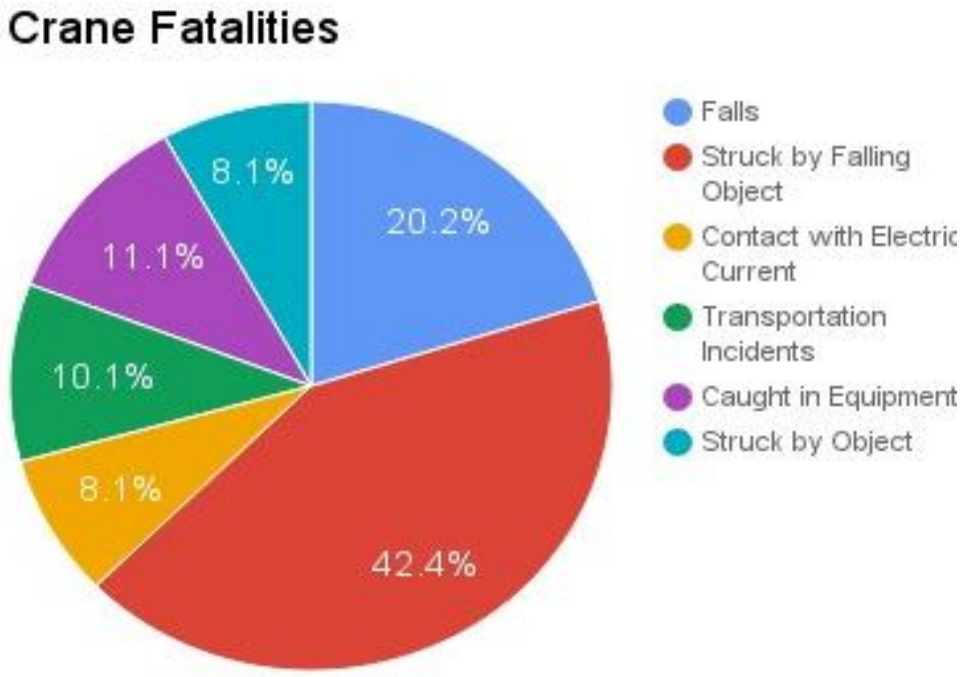


Fig-1: Causes of Accidents in Construction Sites.

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## 2. PROPOSED SYSTEM AND WORKING MODEL

The system proposed is hardware-software control system which can be efficiently used to detect the obstacles and as soon as an obstacle is detected, the results are displayed on the computer screen.

### 2.1 Hardware

The above figure represents a brief overview of this radar system. Here, as it is shown the controller we are using is Arduino, with the input Ultrasonic sensor and the output is the servo motor which rotates 180 degrees. The microcontroller controls all the operations of this system, from rotation of the motors to the obstacle detection of the ultrasonic and representation of the result on the screen.

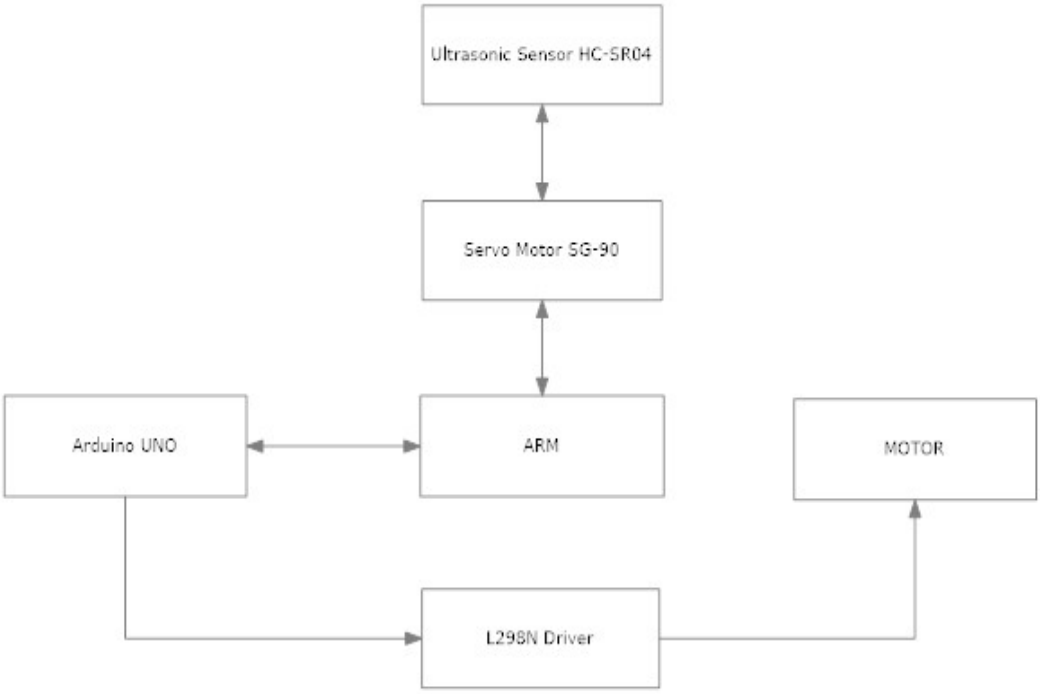


Fig-2: Block Diagram of Proposed System

**Ultrasonic sensors**

Ultrasonic sensors measure distance by using ultrasonic waves. The sensor head emits an ultrasonic wave and receives the wave reflected back from the target. Ultrasonic sensors measure the distance to the target by measuring the time between the emission and the reception**.** Ultrasonic sound waves are vibrations at a frequency above the range of human hearing that can travel through a wide variety of medium (air or fluid) to detect objects and measure its distance without making physical contact.

Ultrasonic rangefinders are commonly used as devices to detect a collision.

Distance Calculation:

The distance can be calculated with the following formula: Distance L = 1/2 × T × C

Where L is the distance, T is the time between the emission and reception, and C is the sonic speed. The value is multiplied by 1/2 because T is the time for go-and-return distance.

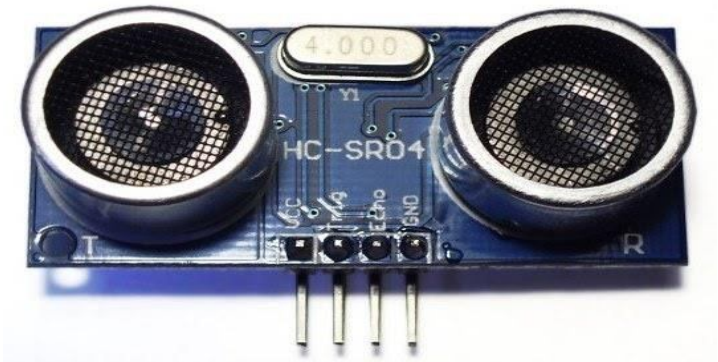


Fig-3: Ultrasonic sensor

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**2.3 Working**

The basic objective of our design is to ascertain the distance position and speed of the obstacle set at some distance from the sensor. Ultrasonic sensor sends the ultrasonic wave in various ways by rotating with help of servo motors. This wave goes in air and gets reflected back subsequent to striking some object. This wave is again detected by the sensor and its qualities is analyzed and output is shown in screen indicating parameters, for example, distance and position of object. Arduino IDE is utilized to compose code and transfer coding in Arduino and causes us to detect position or angle of servo motor and it is communicated through the serial port alongside the covered distance of the nearest object in its way. Output of all of this working is shown in the software called processing, it will display the input/output and the range of the object.

How the system should react to particular inputs and how the system should behave in particular situations:

- If ultrasonic sensor detects any obstacle which is close to the crane then it will show graph on to the screen.
- If the obstacle is too close to the crane & driver does not take any actions then the entire system will stop automatically.

**Testing of the system**

a) Object 1 is placed 30.5 far from the radar, radar gives the distance 32 cm, so:

- error =(
- (32-30.5)/30.5)*100= 4.918%
- efficiency 1 = 100-error =95.08%

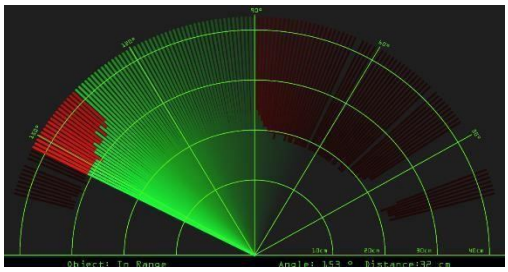

Figure-4: Processing IDE Screen displaying output of the system which we tested by placing objects.

b) object 2 placed at a distance of 20.3 cm,radar gives the distance 21 cm so:

- error = ((21-20.3)/20.3)*100 = 3.44%
- efficiency 2 =100-error= 96.55%

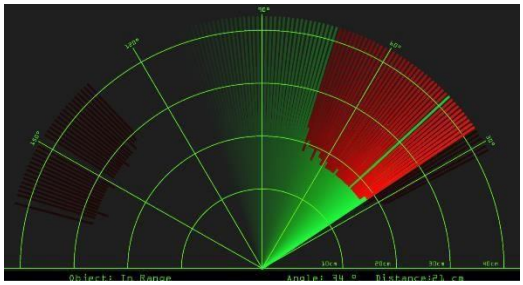

Figure-5: Processing IDE Screen displaying output of the system which we tested by placing objects.

After the observations and calculations we can conclude that this system is 95.815% efficient.

## 3. CONCLUSION

By considering the detection of the obstacle, the collision warning system focuses on the study of avoidance control.This ultrasonic collision detection system can be used on stationary and mobile robots, automaticguided vehicles, and other manufacturing applications.

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# ROOST AFFINITY AND LOCAL MIGRATION OF INDIAN FLYING FOXES, *PTEROPUS GIGANTEUS,* IN THE RIPARIAN HABITAT OF RIVER SAVITRI, MAHAD, MAHARASHTRA

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## ABSTRACT
*Indian Flying foxes, Pteropus giganteus, are commonly found bats, famous for their huge colonial roosting habits. These bats are often found on the inaccessible branches of trees having thick canopies. The colonies are found near human habitations and perhaps not disturbed by loud noise, pesticides as well as mass killing.*

*These animals are known to roost at a particular place for years together. The roost in the present investigation is said to be roosting in Mahad along the riverbanks of Savitri for past 65 years. The colony is being monitored for roosting habits, bat behaviour and local migration since 1996. This roosting colony despite being disturbed has not changed its location although the bats tend to migrate locally in the same area. Fluctuations in population has been observed since 1996, owing to rapid urbanization in the area. Since 1996, the bats have left the area only once in 2005, for a short time period of about two months when River Savitri had over-flooded and the water took about two months to recede.*

*Keywords: Pteropus giganteus, roost, River Savitri.*

## INTRODUCTION
Roosting ecology of bats involves an interaction between physiological, behavioural and morphological adaptations. Roosts are mainly formed to have social interactions, protection from predators and to sustain weather changes and also help the animals to conserve their energy. Roost affinity is immense in some species of bats while it is more or less negligible in others. Roost switching as well as roost affinity is yet to be clearly understood. Most of the pteropodids are seen to migrate and change roosts in response to climate and availability of food (Nelson, 1965, Thomas, 1983, Law, 1993, Vardon and Tidemann, 1999, and Fleming and Aby, 2003). Local migration in the same area showing roost affinity in *Pteropus giganteus* has been observed in these flying foxes of River Savitri.

## METHODS
Indian flying fox (*Pteropus giganteus*) is the most easily sightable bat species. Their large size, easily spottable roost and their tendency to roost near human habitation, all make them most easily accessible and studied species.

Roost reports were documented from local residents coupled with our periodic visits. Roosts were checked every fortnight for first three years since 1996. Post May 1998, the observations were done on a monthly basis till May 2004. The observations continued on a quarterly basis till 2014 and on monthly basis since 2015. A resident of the area has been keeping a continuous tab since 1997 and reporting changes if any, in roost area or behaviour. Roost location of flying foxes and its characteristics were recorded during every visit. General habitat was also recorded; sources of disturbance of the roost were assessed and recorded too. This data was collected from various guides and direct observations. Photographs were taken by a digital Olympus 7.1 megapixel camera with 18X zoom, Canon Powershot SX 530HS with 50X zoom, Nikon Coolpix P900 with 83X zoom and Canon 1200 D Digital SLR Camera (18-55 mm Canon lens, 55-250 mm Canon lens and 70-300 mm with Macro Tamron lens); and also clicked on Samsung Galaxy Grand Prime mobile, Samsung Galaxy A7 mobile, LG K10 and Samsung Galaxy J7Pro mobile phones.

## OBSERVATIONS AND DISCUSSION
The area under observation was divided into eight sub-areas, from Police line to Garden (distance approx. 0.540 km), namely Police Line (PL), River Bank (RB), Ground Right (towards hospital) (GR), Ground Opposite (Opposite Tech School) (GO), Ground Left (towards road) (GL), Technical School (TS), Maternity Home (MH) and Garden (GA).

| PL | RB | GR | GO | GL | TS | MH | GA |
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The information gathered from local residents revealed that flying foxes (*Pteropus giganteus*) have been roosting in Mahad near River Savitri ($73^{O}$ 25' 15'' E; $18^{O}$ 04' 27'' N) for more than 65 odd years.

These flying foxes, were found to roost on trees such as mango (*Mangifera indica),* Bridelia, *Wrightia, Eucalyptus,* Indian bo tree, *(Ficus religiosa),* banyan tree *(Ficus benghalensis),* fig tree *(Ficus glomerulosa),* Indian beech (*Pongamea pinnata),* pine tree (*Casuarina equisetifolia),* etc. Birds such as cattle egret, pond heron, kite, rose-ringed parakeet, blue rock pigeon, barn owl, grey hornbill, coppersmith barbet, Indian maina, house crow, red-vented bulbul, magpie robin, sparrows, purple sunbird, pied kingfisher, common kingfisher, blue throated kingfisher, etc., also occupied same trees for their nesting and perching.

The roost is being visited since January 1996. The flying foxes have been roosting in same area of about 0.0786 square km. Though they have been roosting on different trees still their area remains unchanged. This roost was being disturbed for past 60 odd years by local residents for meat and manufacture of 'bat oil' (Mantri U et al., 1998). Although the bats have been changing their roosting trees they have not changed their locality but fluctuations in population were observed. The tree on which these bats had camped from the year 1997 to 1998, never returned to same tree which finally got uprooted in the storm and flood during July 26, 2005. According to the residents the bats were roosting on trees in the garden area before 1996 for many years. Then the bats suddenly moved to maternity home and School playground area (Chavan U. et al., 2011). In 2012 the trees they were roosting towards the roadside (GL) were removed to broaden the road. Then in 2016 the trees of lining the playground towards maternity home were felled down for construction of school building. Thus forcing the bats shift to the area they roosted 20 years ago, i.e. garden area. The trees were changed regularly by the bats.

The present roost under observation is situated near River Savitri at Mahad. The bats roosts are found within 10 – 100 meters range of the river. The flying foxes generally colonized trees near to the river. As noted by Tidemann et al (1999), *Pteropus alecto* of Australia mostly roost in coastal areas, whereas *Pteropus scapulatus* extend up to drier areas. They further state that most of the camp sites were found in the riparian regions (an area between land and river) including freshwater mangroves, bamboo, closed forests (a forest with a tree canopy coverage of 60 % to 100%), etc. Island Flying Fox, *Pteropus hypomelanus* is found in coconut dominated forests and Little Golden Mantled Flying Fox, *Pteropus pumilus* is found to roost on beach forests as well as coconut dominated forests as observed by R. O' Malley et.al. (2006), on Danjugan Islands of Philippines. *Pteropus tonganus* roosts colonially in lowland native forests, along cliffs, islets, intermediate zones of vegetation, near freshwater, inland swamps, generally in relatively inaccessible sites of Samoan Islands of Pacific Ocean (Koopman, 1993, Miller and Wilson, 1997).

The roost under observation was being disturbed by local residents for meat and for the manufacture of 'bat oil' till 2014. In spite of this, bats have not changed their locality, though they have been changing their roosting trees (Kronwitter, 1988, and Reiger, 1996). Vardon et.al. (1997), experienced a great difficulty moving colony of *Pteropus scapulatus* in the Northern Territory of Australia. They tried methods such as 'Bird Frite' and cattle crackers, harassment by light aircraft, water jets and smoke. *Pteropus scapulatus* resisted all attempts to move them. However, after a lot of harassment the colony moved only to return a month later. Tidemann (2003) also used sound to displace camp sites of *Pteropus poliocephalus* at Maclean Rainforest Reserve. Flood waters that damaged the camp site of *Pteropus alecto* at Adelaide River in North Australia in 1997 was not occupied that year (Vardon et al., 1997, and Tidemann et al., 1999). Even earthquakes (Jan 26, 2000), annual floods at River Savitri, cyclones, etc., have not disturbed this roosting site. The Pacific Ocean Flying Fox, *Pteropus mariannus* has been observed to change the camp sites in response to humidity and pressure (Wiles, 1990, and Tidemann et al., (1999). Flood in July and August in 2005 that lasted for nearly two months did not keep flying foxes *Pteropus giganteus* away from their camp site. They returned as soon as the water receded. Communally roosting bats show high roost affinity. The flying foxes too showed fluctuations in their number seasonally. *Pteropus alecto* and *Pteropus scapulatus* are known to undertake seasonal movements to track changing availability of foraging resources in landscapes. However main camps of both species were important for mating (Vardon et al., 2001). Even *Pteropus poliocephalus* in eastern Australia showed same results (Nelson, 1965, and Tidemann and Nelson, 2004). Most colonies of *Eidolon helvum helvum* use the same roosts for many years. However some colonies make regular seasonal migrations because of local fluctuations in food availability but return after a few months to their former roosting sites. Though shifting of roosts is common behaviour in bats, *Pteropus giganteus* indicate that they have high roost affinity.

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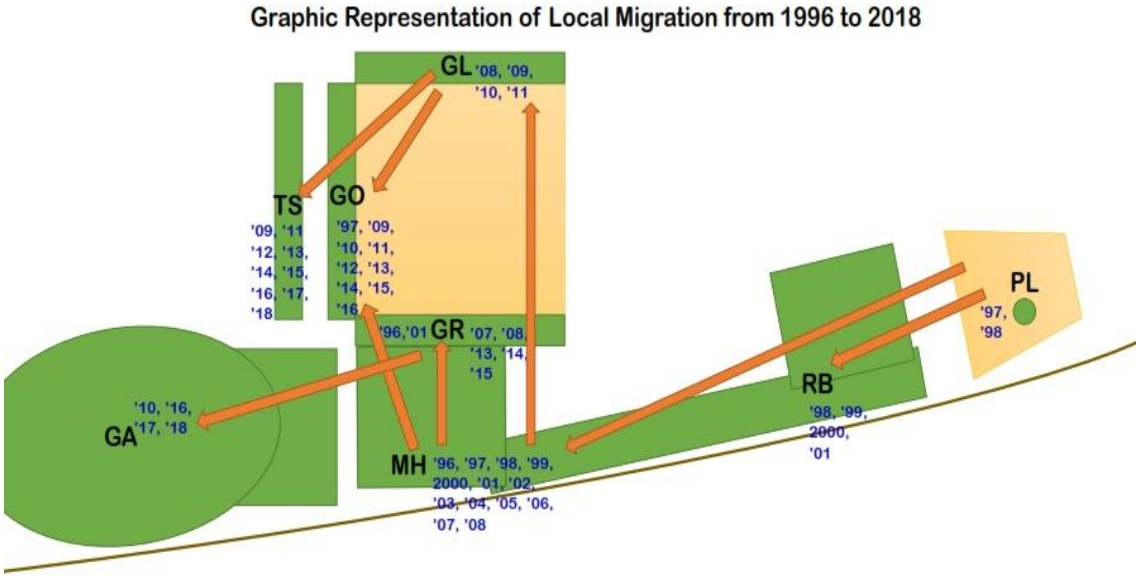


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# TOWARDS WOMEN EMPOWERMENT AND SUSTAINABLE DEVELOPMENT: A CASE STUDY OF SELF-HELP GROUPS IN URBAN RENEWAL PROJECT, NEW DELHI

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## ABSTRACT
*Self-help Groups, everywhere, have emerged as a powerful tool for poverty alleviation and financial inclusion for women. This may particularly be due to the shift in the paradigm from the attitude of welfare towards women to their empowerment in the nineties. Economic empowerment is only one aspect; what is also desirable is to develop their capabilities. This will ensure that women do not merely remain the beneficiaries but become the agency for social change and development. As rightly pointed out by Amartya Sen (1999) that poverty should not merely be understood on the criteria of low income but must be seen as 'deprivation of basic capabilities'. To achieve this, the Self-help Groups require to play a constructive role in shaping women's capabilities. In this context, the paper seeks to examine the role of the two Self-Help Groups, Insha-e-Noor and Zaika-e-Nizamuddin, towards women empowerment and sustainable community development. Both these Self-help Groups emerged in the Hazrat Nizamuddin Basti in New Delhi under the Nizamuddin Urban Renewal Initiative, a Public Private Partnership Conservation project undertaken by the Aga Khan Trust for Culture under the aegis of Aga Khan Development Network. The broader objective is to explore the process of capacity building amongst ordinary women by utilising new opportunities created by macro processes at the local level and producing new identities for themselves*

*Keywords: Self-help Groups, women empowerment, sustainable development, agency, capacity building, quality of life*

## INTRODUCTION
Self-help Group, originated in Grameen Bank of Bangladesh, is the brainchild of economist Prof Mohammed Yunus of the Chittagong University in 1975. It can be defined as "a small voluntary association of poor people, preferably from the same socio-economic background who come together for the purpose of solving their common problems through self-help and mutual help"[1]. In India, National Bank for Agricultural and Rural Development (NABARD) initiated SHGs in 1986-87[2][3] to resolve the issue of lack of availability of institutional credits in the rural areas.

Gradually, the SHG movement became a silent revolution within a short span in the rural credit delivery system in many parts of the world. Having realized the instrumental role of SHGs in economic and social development, SHGs in India have evolved as a mass movement under the government programme of Development of Women and Children in Rural Areas (DWCRA)[4][5].

[1] http://megselfhelp.gov.in/faqs.htm accessed on 27th February 2019

[2] http://shodh.inflibnet.ac.in:8080/jspui/bitstream/123456789/1261/2/02_introduction.pdf accessed on 27th February 2019

[3] However, the origin of SHG in India is a contested issue. According to the Ninth Report of Second Administrative Reforms Commission, SHG formation was initiated in Gujarat in 1954 (Government of India, 2008). Some scholars point out that Mysore Resettlement and Development Agency (MYRADA), a voluntary organization, was amongst the earliest to have formed SHGs in 1985 and that the SHG-Bank Linkage Programme (with NABARD) began only in 1992. (http://shodhganga.inflibnet.ac.in/bitstream/10603/35615/10/10_chapter2.pdf P-46 accessed on 27th February 2019)

[4] http://shodhganga.inflibnet.ac.in/bitstream/10603/125181/8/08_chapter%202.pdf P-74 accessed on 27th February 2019

[5] The DWCRA programme was started in 1982, as a sub-scheme of Integrated Rural Development Programme (Planning Commission, 1985 a, Vol. II, and Indira Bishnoi and Vibha Singh, 2007:1) that included women specifically as the target population to alleviate poverty-stricken families in rural areas. Women too became the beneficiaries of income generating assets and credit facilities through women SHGs with bank linkage facility. Cited in http://shodhganga.inflibnet.ac.in/bitstream/10603/35615/10/10_chapter2.pdf P-49-50 accessed on 27th February 2019

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With the coming of the neo-liberal era, the 'welfare' role of the state was severely curtailed under Structural Adjustment programme (SAP). Consequently, SHGs with their objectives of thrift and savings began to play a significant role not only in rural areas but also in urban ones. Though SHGs can be only men, only women or mixed, it is found that the success rate in achieving their collective goals is highest among women SHGs. SHGs thus have become the agents of not only economic empowerment of women[1] but also sustainable community development in contemporary times.

**OBJECTIVES**

Situated in the above context, the paper aims at understanding the scope of women's Self-help Groups in the process of women's empowerment in their family and community. It attempts to achieve this through an in-depth analysis of Insha-e-Noor and Zaika-e-Nizamuddin, the two Self-help Groups that emerged in the Hazrat Nizamuddin Basti as part of the Nizamuddin Urban Renewal Initiative. In turn, it seeks to explore the process of capacity building amongst ordinary women by utilising new opportunities created by macro processes at the local level and producing new identities for themselves. It thus proposes to evaluate the significance of women's agency towards sustainable development in general and impact on their quality of life in particular.

**RESEARCH METHODOLOGY**

The paper is based on secondary source of data. The website of Nizamuddin Urban Renewal Initiative has been explored extensively to gain a thorough understanding and explore the multiple facets of the two Self-help Groups. Since this urban initiative project was adopted by the Aga Khan Trust for Culture under the aegis of the Aga Khan Development Network, AKDN website has also served as a useful resource. In addition, on-line journals, news articles, books and scholarly articles are used.

**ABOUT NIZAMUDDIN URBAN RENEWAL INITIATIVE**

The Nizamuddin heritage site[2] includes areas of Hazrat Nizamuddin Basti, Sundar Nursery and the World Heritage Site of Humayun's Tomb in India's capital. Despite being a rich repository of seven centuries of living culture, centuries of neglect have led to the deterioration of the monuments and urban decay. The Aga Khan Development Network (AKDN)[3] extended its support to take up the conservation and restoration work of this heritage complex. The Aga Khan Historic Cities Programme (AKHCP) which undertakes projects for urban regeneration and renewal worldwide[4] adopted The Nizamuddin Urban Renewal Initiative in 2007. This Initiative is yet another example of Private Public Partnership. The Aga Khan Foundation (AKF) and the Agha Khan Trust for Culture (AKTC) in collaboration with the Archaeological Survey of India, the Municipal Corporation of Delhi and the Central Public Works Department embarked on this project in 2007. According to Ratish Nandi, CEO AKTC, "It was clear that the heritage site cannot be conserved without rebuilding the lives of the community here. So we have a multi-disciplinary team working towards the improvement of quality of life, including the gender component" (Basu, S: 2016). Consequently, a multi-pronged participatory project

[1] http://shodhganga.inflibnet.ac.in/bitstream/10603/125181/8/08_chapter%202.pdf P-74 accessed on 27th February 2019

[2] Nizamuddin Basti, now inhabited for more than 700 years is considered as one of the oldest living spaces in Delhi. Originally Gysapur, the area was renamed as Nizamuddin after the Sufi saint Nizamuddin Auliya who lived there in the 13th century. https://www.inditales.com/basti-nizamuddin-delhi/ accessed on 28th February 2019.

[3] In 1997, on the occasion of 50th anniversary of India's independence, His Highness the Aga Khan had pledged to undertake the restoration of the Mughal Emperor Humayun's 16th century garden tombs. This restoration was successfully accomplished in 2013 and was inaugurated by Honourable Prime Minister Dr Manmohan Singh and His Highness the Aga Khan on 18th September 2013.

https://www.akdn.org/project/humayuns-tomb-conservation-completed accessed on 28th February 2019

https://www.akdn.org/press-release/humayuns-tomb-restoration-inaugurated-indian-prime-minister-and-aga-khan accessed on 28th February 2019

[4] The Aga Khan Historic Cities Programme has been involved in urban regeneration projects especially in the Islamic world. Examples and details of AKHCP projects in Afghanistan, Canada, Egypt, Mali, Pakistan, Syria, Tajikistan, Tanzania are available at https://www.akdn.org/our-agencies/aga-khan-trust-culture/aga-khan-historic-cities-programme/historic-cities-around-world (Accessed on 28th February 2019)

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including dimensions such as cultural, economic, social, health, sanitation, women empowerment, education and vocational training was designed[1].

**SELF-HELP GROUPS IN HAZRAT NIZAMUDDIN BASTI: INSHA-E-NOOR AND ZAIKA-E-NIZAMUDDIN**

**About Insha-e-Noor[2]**

The Nizamuddin Urban Renewal Initiative, aimed at improving the overall quality of life of the Hazrat Nizamuddin Basti residents, began as a Public Private Partnership venture. A Quality of Life Survey of a sample of 500 households conducted in 2008[3] revealed that only eleven percent women[4] in the Basti enjoyed financial independence having their own source of income. Consequently, livelihood generation became central to the project to raise the socio-economic status of the community (especially of women) and Insha-e-Noor (which means The Creation of Light) was born due to the concerted efforts of the AKTC.

Beginning as a skill training programme in stitching and tailoring, Insha-e-Noor now has become an umbrella project for six strong women's Self-help groups managing an independent handicraft enterprise with a turnover of 20 lakhs in the financial year 2015-16 (Basu, S: 2016). Around 80-100 women of the Basti work at the Insha Craft Centre and create beautiful hand-crafted textile and paper products[5]. It was however a daunting task for the AKTC to bring women to the training workshops. This was because people in the Basti were apprehensive about the goals of the programme and women doubted any monetary benefits out of the project. However, most of these women now earn between Rs 12000-15000 per month (Basu, S: 2016). It has thus not only brought income in the house but also smile, confidence and respect for these women.

**About Zaika-e-Nizamuddin[6]**

Zaika-e-Nizamuddin (meaning Flavour of Nizamuddin) or ZeN is another women's Self-help Group in the Hazrat Nizamuddin Basti, an outcome of the study carried out in 2011 on the prevalence of malnutrition in the Basti. The study revealed a shocking statistic: almost half of the children under the age of six were malnourished. One of the main reasons cited by the study was lack of availability of healthy snacks options. These findings served as the driving force for the emergence of ZeN by few mothers of the Basti. Though originally aimed at improving the nutrition levels of children by providing low cost nutritious snack options[7][8], by 2015 ZeN became a livelihood generating option for these women[9] and an agency to keep alive the 700-year-year-old Mughlai culinary heritage[10]. ZeN thus exemplifies the confluence of tradition with entrepreneurship.

**Analysis**

This section presents a brief analysis of the impact of the two Self-help Groups on women's empowerment and sustainable community development.

But for this, it is essential to understand the concept of women's empowerment. Since the term is relative in nature, there is no consensus on its definition, meaning and measurement[11]. Put simply, women's empowerment

[1] http://www.nizamuddinrenewal.org/home.php accessed on 28th February 2019

[2] http://www.nizamuddinrenewal.org/livelihoods/insha-e-noor.php accessed on 2nd March 2019

[3] http://www.nizamuddinrenewal.org/urban-planning/ accessed on 28th February 2019

[4] http://www.nizamuddinrenewal.org/livelihoods/insha-e-noor.php accessed on 2nd March 2019

[5] Insha Craft Centre makes handicraft items such as notebooks, lampshades, gift boxes, coasters, wall hangings based on Saanjhi craft as well as crocheted items such as pouches, toys, fashion accessories, bags, scarves, baby blankets etc. (ibid)

[6] http://www.nizamuddinrenewal.org/livelihoods/zaika-e-nizamuddin.php accessed on 2nd March 2019

[7] ZeN refrains from using preservatives or frozen ingredients in any of their preparations. There is strict adherence to hygiene and safe working conditions. (ibid)

[8] ZeN received initial support from AKDN's Nizamuddin Urban Renewal Initiative towards this endeavour. (ibid)

[9] Women earn through catering or providing home delivery services (ibid)

[10] ibid

[11] Several scholars such as Mukerjee (1975), Dixon (1978), Acharya and Bennett (1981), Maithreyi KrishnaRaj (1986), Mason (1986) as well as the Committee on the Status of Women in India (1974), United Nations

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can mean relative improvement in the status of women and is intricately linked with the power structure existing in that society.

In the case of the Nizamuddin Basti, women's role was circumscribed to domestic chores and their mobility was controlled by the male members. Very few of them were financially independent and possessed any skills beyond those required for their familial duties. Both Insha-e-Noor and Zaika-e-Nizamuddin provided opportunities for these women to step out of their conservative homes and gain a new identity that they take pride in. These SHGs act as platforms for a dignified and sustained source of livelihood for the women. Zaike-e-Nizamuddin has not only become an income generating avenue for women but also an active player in preserving the rich culinary heritage.

The significant role of these SHGs in women's empowerment becomes clear from the following narratives. Husna, a 24-year old municipal school teacher who introduced arts and crafts in the school curriculum is the first woman earner in her family. Similarly, 60-year old Sayeeda is now enjoying financial autonomy in its truest sense. "I spend what I earn on myself" (The Times of India, 8th March 2018)[1]. Further, she is proud to have stepped beyond her domestic role and created an identity of a counsellor. Sayeeda says, "Earlier I was just a housewife cooking, cleaning and looking after the family. Today neighbours seek my advice on community issues and my family asks for my opinion on domestic matters" (ibid).

These narratives should not be considered as simple success stories but testimonies of their long-drawn struggles on their journeys to empowerment. Many of them faced taunts and even stiff opposition from their families[2]. But the sheer persistence to bring about a meaningful change in their lives and that of the Basti proved successful. This should however not be interpreted that there is complete freedom accorded to these women. They still live under patriarchal shadows[3].

The two Self-help Groups have definitely played a significant role in filling up the vast chasm in empowerment and freedom for the women in the Basti which otherwise is enjoyed by a miniscule fraction of women's population in our country. Women now are better equipped to articulate their rights and voice their desires and concerns more actively. For example, women of the Basti pointed out to the lack of availability of open and safe public spaces for them. To cater to this, AKTC in partnership with the Delhi Development Authority developed a public park with an open air gym exclusively for them (Basu, S: 2016).

One must also acknowledge the role of AKF and AKTC in the formation and development of SHGs in the Hazrat Nizamuddin Basti and applaud their concerted efforts to promote women's agency in reclaiming their deprived role in public sphere and community development. Unlike most of other NGOs which target a specific aspect of development in their projects, AKTC has strengthened holistic human development by enlarging opportunities and access to resources. Consequently, these SHGs will continue to be the drivers of sustainable community development even after the culmination of the project. This is precisely the vision of AKDN projects worldwide which is shared by His Highness the Aga Khan: "Development is sustainable only if the beneficiaries become, in a gradual manner, the masters of the process. This means that initiatives cannot be contemplated exclusively in terms of economics, but rather as an integrated programme that encompasses social and cultural dimensions as well."[4]

**Final Thoughts**

Economic empowerment of women through micro entrepreneurship has a domino effect. It has the potential to lead to the empowerment of women in socio-economic aspects; social equality, personality development, family

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Report 1980 have deliberated on the complexities and multiple dimensions of understanding of this term (cited in Chapter II, Women's Self-Help Groups: Conceptual and Analytical Framework Pp 13-14 http://shodhganga.inflibnet.ac.in/bitstream/10603/21795/9/09_chapter%202.pdf accessed on 2nd March 2019)

[1]https://timesofindia.indiatimes.com/city/delhi/stepping-out-of-purdah-they-find-their-feet/articleshow/63208927.cms accessed on 2nd March 2019

[2] ibid

[3] Shaheen, who attended the Saanjhi Jaali Paper Cutting training workshop, points out that though the male members did not impose restriction on this but they wanted her to 'carry her modesty' with her. https://www.firstpost.com/living/the-women-of-nizamuddin-basti-aga-khan-trust-for-culture-brings-a-new-light-into-their-lives-3090938.html accessed on 2nd March 2019

[4] http://www.nizamuddinrenewal.org/home.php accessed on 28th February 2019

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development, community development, market development to the extent of even enhanced political participation. Developing these various capabilities is indeed development with a human face. As Amartya Sen (1999) rightly points out that while improving the well-being of women is important, enhancing their agency is equally crucial.

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# LEPROSY AND GENDER BIASNESS STIGMATIZATION

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## ABSTRACT
*Gender inequalities in health have a significant influence on women's health. In the case of Leprosy gender inequalities are more seriously stigmatized disease as it is linked with disability as well as vulnerability. Gender-sensitive interventions are important for the prevention and treatment of infectious diseases since health outcomes differs among women and men. Women who are the minority section of the society if affected by Leprosy are even more discriminated therefore there is a need to overcome this gender biasness, and the stigma correlated with it. This paper will try to focus to the gender disparity and its impact on women's health related issues which even after years of efforts is still a matter of concern.*

*Keywords: Gender, Discrimination, communicable diseases, stigmatized.*

## INTRODUCTION
Leprosy is a disease, which creates fear in the society as a mutilating, disfiguring, communicable, contagious and incurable disease. Leprosy has been a highly stigmatized disease for centuries mainly because it causes physical disfigurement and no cure was available until the 20th century. The *Atharava Veda* (circa 2000 BC) and the *Laws of Manu* (1500 BC), mention different skin diseases interpreted as Leprosy. The Principles of Law of Manu prohibited contact with those affected by Leprosy and punished those who married into their families, effectively snubbing those with the disease as believed for their past sins. Ancient Indian society marginalized those suffering with Leprosy because of a number of reasons such as its chronic, connection with sin, and the notion of pollution. These reasons endowed Leprosy with a unique stigma that persists even today and results in its treatment with both seclusion and medical therapy.

The past three decades have seen huge advancements in the diagnosis and treatment of Leprosy, freeing over sixteen million people from the disease since the introduction of multi-drug therapy. However, an estimated three million people still remain undiagnosed, a disproportionately large number of whom are women. Gender inequalities are noticeable in cultures globally , the psychosocial and economic problems caused by Leprosy are further magnified in women due to existing gender disadvantages.

The Indian government's initial approach started in 1955 with the implementation of the National Leprosy Control Program for Surveillance (observation). In 1983, with the availability of curative multi-drug therapy, the government changed the name to the National Leprosy Elimination Program (NLEP), with a focus on treatment. Starting in 1997, the government conducted several Leprosy elimination campaigns; which concentrated on state-wise case detection programme which also included orientation of all village-level workers and volunteers on Leprosy, visits were made from house-to-house in specified areas to trace the people suffering from Leprosy, simultaneously awareness programs using mass media, school activities, and community meetings were also carried out. State governments also integrated Leprosy care into their general health systems in 1997, which moved from vertical control programs to horizontal health services, an initiative also was taken to decrease the stigma associated with Leprosy through family orientation, counseling and community outreach.

### Leprosy and Gendered Issues
There is a strong Stigma and discrimination associated with women's suffering from this communicable disease. Women with Leprosy are subject to sharp levels of discrimination, degrading their social status and mental wellbeing. Living in fear of stigmatization and the prospects of losing their role in society, due to which many do not pursue adequate treatment, and leading a poorer health and exclusions. This impacts the health of the women immensely because if left untreated, Leprosy eventually damages large nerves in the elbows, wrists, knees and ankles, resulting in a loss of sensation in the hands and feet, together with muscle paralysis. Additionally, by damaging nerves in the face, Leprosy can also lead to blindness and facial disfigurement as bones in the face become damaged. The resulting physical impairments have dire implications on an individual's wellbeing and quality of life, limiting their ability to carry out even basic day-to-day activities.

It should be noted, if Leprosy is treated in its early stages, long term damage or disability is unlikely and early intervention is crucial in mitigating the future adverse health implications for those infected with the disease.

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**Gender Roles often Prevent Diagnosis**

Socio-cultural factors related to gender roles are a major factor contributing to women's reluctance or inability to seek medical treatment. Women are often tied to their homes by childcare and domestic roles and often feel pressured into giving first priorities to their domestic duties above their own personal health. As such, most women delay going to hospital until their husband or guardian felt it was necessary, and would still have to participate in household chores despite their illness. The pressure to perform household chores, perceived decline of their social worth, along with the inconvenience and limitations of accessing health care, leaves many women unable to complete their treatment.

These pressures are further increased by discriminatory marriage customs. In many countries, such as Indonesia, fear of contagion combined with supernatural beliefs provides sufficient grounds to divorce a spouse. If a husband chooses to divorce his wife because of her illness, women can often find it difficult to remarry, thus further degrading a women's social status, heightening levels of isolation, and often leading to significant damage to a woman's mental health, physical health and overall well-being.

A factor that further leads to self-stigmatizations in women and avoidance of treatment is due to significant disparities in education and access to information on health. Many women do not fully understand their condition, sometimes lacking an awareness of the symptoms of Leprosy or the kinds of treatment that are available to them. The cultural practice of early marriage in some countries is a contributing factor in reducing access to education, and, as such, leading to greater levels of illiteracy and a reduced understanding of health conditions.

**Scenario in Developing Countries**

Studies in Pakistan and India found that women are generally more compliant than men (95% vs 83% in India). Since Leprosy is believed to be the fury of God, resulting in women delaying taking treatment until measures such as fasting and offerings had been made (18% of women compared to 6% of men). In India, many women, after being diagnosed with Leprosy, and despite Multidrug Therapy (MDT), continued to rely on religious and traditional sources. Women could also be hesitant to take Leprosy medication for different reasons, such as the perceived effects of the drugs: Rifampicin, one of the MDT drugs for Leprosy, turns the urine dark. Many women were concerned about this side effect of the drug, as the change of colour is associated with jaundice, which is considered one of the deadliest diseases and therefore stopped taking treatment.

The study from Pakistan, included only women, and did not report whether the same fear was present in men. This study found that the dark skin coloration associated with Clofazimine, is a big problem for many women as a dark skin is often associated with lower social status. Health workers frequently face a mother-in-law who forbade her daughter-in-law to take MDT for this reason. In Nepal, treatment compliance was also found to be related to the quality of the services. Outcome of disease can be measured both in medical and socio-cultural terms: the consequences of Leprosy could be different grades of deformities and disabilities, but also social isolation or expulsion of the women from the family. Significant differences exist in disease outcome, deformities being more common among men than women.

A socio-cultural explanation for the observed gender difference could be different occupations between men and women: Two studies attributed the gender difference in incidence of deformities to men working outdoors involving both hand and feet. In India, men were found to be more affected by their feet, while women suffered more Leprosy associated injuries on their hands. Feet are more vulnerable in agricultural and other outdoor occupations while hands are more exposed in indoor occupations. In many cultures, however, women also do much of the outdoor work, fetching fire wood and water, working on the fields, and are on their feet all day. Considering socio-cultural outcome of disease, several studies indicate that women are more affected by Leprosy. They suffer more isolation, rejection from spouses, children and relatives, loss of freedom to touch and have more restrictions than men in India. Women with Leprosy are less likely to have the opportunity to marry. In Brazil, women tend to remain single, separated or widowed, live with relatives or with their children without their spouse, and indicate Leprosy as a reason for family separation.

The history of Leprosy in India offers perceptions into one of the world's most misinterpreted diseases. Leprosy control and elimination in India still faces many challenges and superstitious hurdles. Although many of the theoretical and practical approaches of the past have been discarded, but still there is a need for careful examination which could provide better insights for the future. Supporting the gains made so far and further reducing and eradicating the disease encumbrance in India requires an innovative, holistic and empathetically humanistic approach that should include ongoing education, efforts to identify interventions to chase away stigma, and the inclusion of non-allopathic practitioners in disease control programs.

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## CONCLUSION

Though National Leprosy Eradication Programme (NLEP) is trying to eradicate Leprosy but there is a need for a gender sensitive approach must be taken by charities, national health programmes and international organizations, when implementing future strategies to reduce Leprosy transmission. Organizations must approach gender inequality in a culturally sensitive way, by engaging with local communities and working with local health officials, teachers and community leaders, who have a greater understanding of the cultural processes of within their local area. A focus on education and greater collaboration with influential community members can facilitate the creation of bespoke and trusted strategies to tackle gender inequality. Finally, it is the role of national governments to repeal laws that discriminate against people affected by Leprosy, with the ultimate aim of ending stigmatizations and Leprosy discrimination through a state sponsored, legal framework.

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# GREEN COMPUTING TODAYS NEED AND IMPLEMENTATION

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**ABSTRACT**
*Green computing provide the facility of reusability of resources that are currently used by various technologies. Green computing is an effective approach to protect our environment from the hazardous material and its effects that comes from the computers resources. It is an effective study of environmental science that use manufacturing, using, disposing and recycling of computer resources and other electronic devices. In this research paper we concern about the Green computing, its needs and steps toward Green computing by a common man. Problems faced while applying green computing. This research paper defines the basic need of computer for everyone. No one or any business organization cannot work without computer, But they also have to aware about the injurious impacts to use of computers, also process of manufacturing and disposing. What several steps we should take to decrease the injurious impacts and save our environment.*

*Keywords: Green computing, environment, computers, hazardous, carbon dioxide (CO2).*

## 1. INTRODUCTION

Green computing also called as green technology, is the environmental responsible use of computer and related resources. Such process include the execution of energy-efficient central processing units (CPU's), Servers and peripherals as well as reduced resources consumption and proper disposal of electronic waste(e-waste). Green computing aims to reduce the carbon footprint generated by the Business Information Systems while allowing them to save money. The Green technology, as defined in the Authorized Journal of the French Republic on July 12, 2009. To reduce the negative effects of human activity on the environment the ESTs of information and communication for short eco-ICT, are information technology and communication is design. There is a more need to implement the theory of Green computing to save our environment. Use of computer or electronic goods plays a big role in environment toxic waste. About more than 60 percent energy is utilized by computers which are not in use but they are turned ON and the utilization of power is the main reason of generation of CO2. That's why everyone have to know the need of saving the electricity by their behavior to save environment.

## II. WHAT IS GREEN COMPUTING

It is technology which is responsible for eco-friendly use of computers and their resources. It is also known as the identifying the new designing, engineering, manufacturing, using and disposing of computing and electrical devices in a way that minimize their environmental impact.

Near about every computer and electronic goods manufacturers and sellers are continuously investing in designing energy-efficient computing devices and resources to reducing the use of injurious goods and motivating the recyclability of electronic devices. Green computing process came into eminence in 1992, when the Environmental Protection Agency (EPA) launched the Energy Star program.

## III. PROBLEM FACED WHILE APPLYING GREEN COMPUTING

Green computing is now a days becoming a research problem and many scientists are focusing their attention to do research on various issues related this discipline. The problem addresses issues such as effective power utilization maximizing efficiency, maximizing efficiency of utilization, correct disposal of electronic gadgets, reliable and cost effectiveness etc. one of the most used components by information and communication technologies(ICT) group are personal computers and hence considered for our analysis under green computing any personal computer has major functional components such as CPU, memory, monitors and peripheral device etc. each components have certain contribution towards green computing. The main focus of attention of this section is to study how the electricity consumed by each functional units are effectively minimized so as to perform the job without any deviation while using the personal computer.

Here are a few of the ways that technology can harm the environment.

**E-Pollution**: e pollution can effects following factors of environment air, water, heat and noise pollution can all be cause of producing and using technology.

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**Resource utilization:** Non-renewable resources, including precious metal like gold, are used to make technology. Many other such as coal, are consumed to generate the electricity to use technology. Even some renewable resources, like trees and water, are becoming contaminated or are used up faster then they can renew themselves because of technology.

**E-Waste**: Manufacturing the electronic product it creates big amounts of waste and used computers and electronics get thrown out when they break or become outdated called "technotrash" theses electronics contain all sorts of dangerous materials that are very injurious for the environment. They need to be disposed of using specific methods.

**Disrupting ecology:** Clearing land where animals used to live to build factories and allowing pollution to contaminate the food chain can greatly affect the environments natural cycles.

**Health hazards:** Using toxic materials that can health can cause cancer and technology addition can lead to other health problems like obesity and carpal tunnel syndrome.

We can motivate manufacturers to buy more energy efficient and less dangerous electronics and support companies to make protecting the environment a priority. You can also take your own efforts to reduce environmental impact by not being wasteful and disposing of your electronics safely and properly.

## IV. NEED OF GREEN COMPUTING

When the news demanded that the environment was not a renewable resource, it really hit home and people started thinking that they had to do their part to safeguard the environment. Therefore, green computing is an significant idea to keep our environment healthy. When time come to recycling computer, it is difficult to dispose the old computers and another thing is that they take up much space. In some way, the problem is that the electronic waste is increasing tremendously within this period. Many injurious effects are regularly showed up towards this environment, especially to human health. Due to the quick uselessness of electronic goods, it resulted a horrible 70% of all dangerous waste. E-waste is high in many toxic equipment's such as heavy metals and flame-retardant plastics, which easily leach into ground water and bio-accumulate. In addition, to producers of chips of the electronic needs large amounts of resources and some toxic gases and chemicals are used to man.

As an every year near about 24 million computers have become outdated in United States. Only about 14% (3.3 million) of these will be recycled or donated. Over 20 million computers, the rest in U.S. will be get cleared of, destroyed or transported as waste products or to be distributed with later in the temporary storage. We do not care about what happens when our laptop dies and just stop to consider it. The reality is that it either disintegrated in a landfill or developing countries. The children there struggling its machineries apart by hand and tender toxic bits to discover traces or valuable metals like gold.

To minimize these impacts the term green computing comes into existence. There are various motives behind the use of green computing are:

A. Computers and electronic devices utilized a lot of power that have some harmful impact on our environment. It effects on air, Land pollution and water pollution. To generate Electricity through Fossil Fuel power plants it produces the release air pollution and requires a lot of water that effect our environment like climate change, acid rain (pH<5), ozone(O3) and air toxic.

B. Most of electronic devices generate a lot of heat which cause the emission of CO2. Co2 is one of the green house gases, warming the earth surface to higher temperature by reducing outward radiation. With the rapidly increasing of carbon Dioxide the rate of global warming became increase causing and through anthropogenic climate change.

C. While disposing of computers and it resources produces a lot of hazardous waste that really damage our environment. It also releases heavy metal like lead (Pv), mercury (Hg), cadmium (Cd) into air.

D. The manufacturing of computers product release heavily on the use of toxic comical for electrical insulation, soldering, and fire protection. Expose the comical fumes over the long term can cause cancer, cause miscarriages.

All these causes can be reduced using one concept i.e. "Green computing". Now we have needed to implement the green computing on various electronic and electrical devices to save our environment from these harmful impacts

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## V. EFFORTS FOR GREEN COMPUTING

We don't have to stop using computers and even do not stop using electricity but we have to do some determination to make environment healthy. The following actions should be taken by us:

1. Use Products Energy Star labeled: - All the energy star labeled products are manufactured with keep in mind the term Green Computing and its features. These products are produced on the idea of less power consumption. These equipment's are programmed to power-down to a low power state or when they are not in use. So we need to use "Energy Star" labeled desktops, monitors, laptops, printers and other computing devices.


Fig-1: Energy Star Logo

***c) Shut Down your computer*: -** As the previously used figures stated that PC's and its peripherals consume more power and resultant is the high amount of CO2 emission. So we have to keep it in our mind and never hesitate to turn off our personal computers when they are not in use.


Fig-2: Green Computing with Power Off

***3. Keep in Sleep Mode*: -** Sleep mode save our session and put our computer in a low power state so that we can quickly resume windows. Always put our PC on sleep mode when not in use. It saves 60-70 percent of electricity.

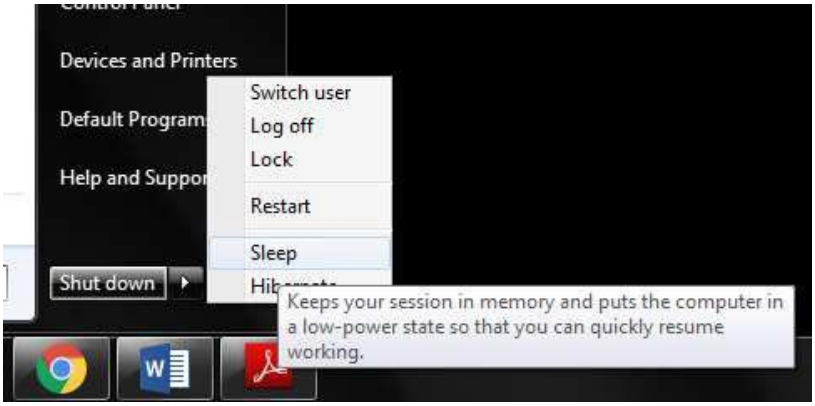


Fig-3: Sleep Mode function in windows 7

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***4. Hibernate our computer*: -** This mode allows us to shut everything down. When we are not using our computer for a short period of time we have to hibernate it. It saves the power when computer is not in use, but when you resume it gives all work as it is when it hibernate.

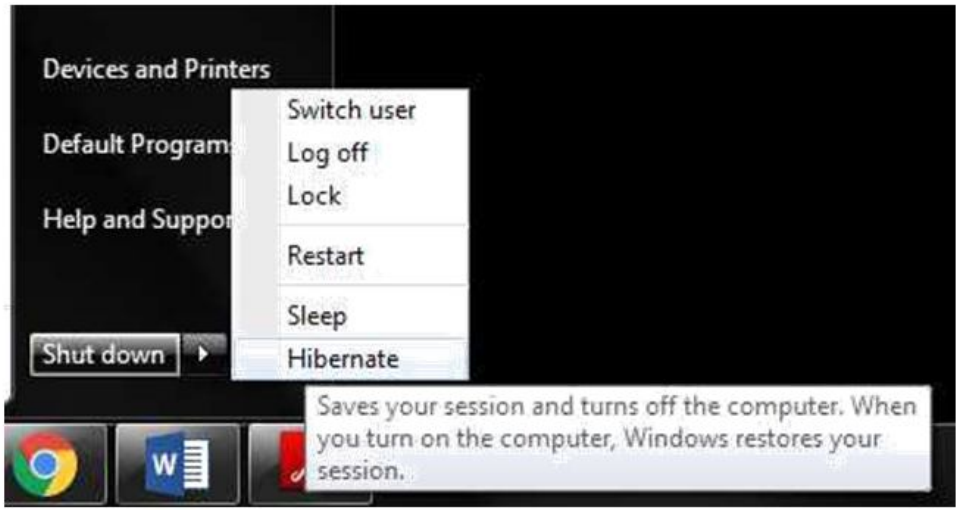


Fig-4: Hibernate option in Windows XP

***5.Set a power plan*: -** Set an effective power plan to save electricity. Because if our computer consumes more power, they generate more harmful impacts on our environment. It can help you maximize your computers performance or conserve energy.

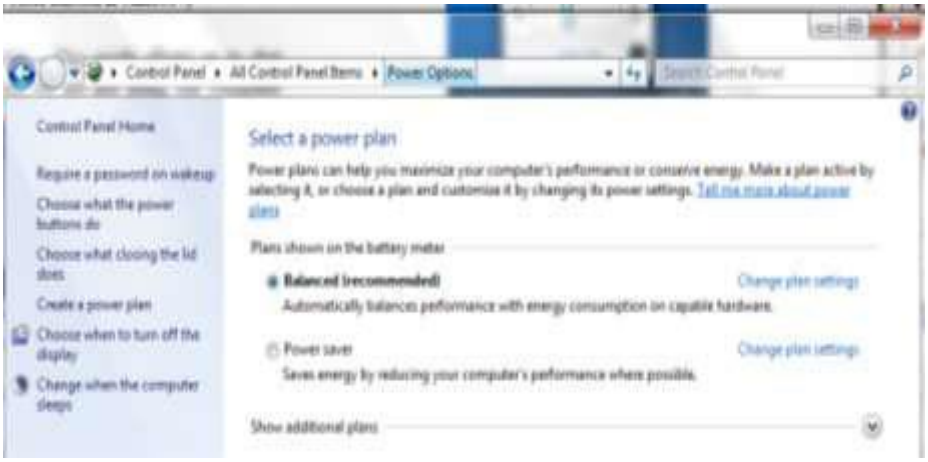


Fig-5: Set a power plan

***6. Avoid using screen saver*: -** Screen savers are also consumes electricity even when a computer is not in use. Screen saver can be a graphic, text or an image that shows on computer screen when it is not used for pre-set time. But the good option to save energy that turn off your monitor when it not in use.

Fig-6: Example of No Screen Saver

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***7. Adjust monitor brightness*: -** Electricity consumption plays a main role in CO2 emission. If we use our PC at a high brightness it consumes more electricity than using at a normal brightness. So we should always minimize the our PC's brightness to save electricity.


Fig-7: Example of Less Brightness

***8. Stop informal Disposing*: -** Computer and its components use toxic chemicals when manufactured and when we use informal disposing they put harmful impacts on our environment. So to minimal or reduce these harmful impacts we have to use formal disposing.

Fig-8: Example of Informal Disposing

***9. Use LCD rather than CRT monitors*: -** The use of new technologies can play a vital role to reduced power consumption. LCD (Liquid Cristal Display) is the less power consumption device then CRT (Cathode Ray Tube). So if we have to use LCDs rather than CRTs to save our environment from the effect of CO2 emission .

Fig-9: LCD rather than CRT monitors

***10. Recycle old hardware*: -** Recycling of computer hardware is producing of new hardware devices using old one. Recycling using formal techniques is follow by various manufacturers. It is done in a special laboratory. It also need a lot of money but the main feature of formal recycling is to save our environment from pollution. So we have to recycle our unwanted hardware using formal techniques.

Fig. 10 (Example of Formal Recycling)

11. Power-up and power-down energy-intensive peripherals such as laser printer according to need.

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## VI. CONCLUSION

This research paper shows the need of Green computing. We should recognize the need of Green computing and as shown in research paper necessary steps should be taken for well environment. If we do not then we will suffer from air, water, soil etc. So using some little technics and understanding need of green computing need we should take the steps from today or even from now. In this paper we determine that green computing is very essential for neat and clean environment.

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## LITERATURE & CULTURE - CULTURAL DIASPORA

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**ABSTRACT**
*The term diaspora comes from an ancient Greek word meaning "to scatter about." And that's exactly what the people of a diaspora do — they scatter from their motherland to places across the globe, spreading their culture as they go. The Bible refers to the Diaspora of Jews exiled from Israel by the Babylonians (Babylonia was an prehistoric Akkadian -speaking state and cultural area based in central-southern Mesopotamia. A small Amorite-ruled state emerged in 1894 BC, which contained the minor administrative town of Babylon.) . But the word is now also used more generally to describe any large migration of refugees, language, or culture.*

*A diaspora is a scattered population whose origin lies in a separate geographic locale. Other qualities that may be typical of many diaspora are thoughts of return, relationships with other communities in the diaspora, and lack of full integration into the host countries*

**INTRODUCTION**
According to Israel Yuval, the Babylonian captivity created a promise of return in the Jewish consciousness which had the effect of enhancing the Jewish self-perception of Banishment after the destruction of the Second Temple, albeit their diffusion was due to an array of non-exilic factors

A corporate, communal, or shared diasporic identity is defined by the relationships between the dispersed; Distance from one's. Motherland generates a sense of loss the diasporic. Experience tends to focus on a communal memory of a lost homeland, childhood, cultural.Other qualities that may be typical of many diasporas are thoughts of return, relationships with other communities in the diaspora, and lack of full incorporation into the host countries.

**RESULTS**
Globalization covers the most diverse spheres of human life, including social, where the rocesses of migration and globalization of culture take on special significance. Cultures arise and develop, interacting with each other. And the first field of this interaction is the diaspora. Diaspora is the environment where culture is directly developed and enriched. The development of Diasporas is carried out by spreading the culture, values and traditions of their people, but at the same time integrating into society with a different culture, which implies the acquisition of new socially and spiritually significant qualities. The psychological reason for the emergence of the diaspora is that people far from their motherland begin to understand, appreciate and even more love their native culture. The development of the modern world is characterized, as we know, by globalization.

**DISCUSSION/CONCLUSION**
Can the phenomenon of the diaspora in modern social life be associated with it? No, because the diaspora is directly connected with culture, while globalization is opposed to culture. Globalization is aimed at unification, ignoring the problem of cultural identity. Globalization involves the erasure of cultural features, the loss of cultural, ethnic, religious differences. But at the same time, globalization contributes to the growth of population migration, which leads to an increase in the number of Diasporas abroad. The rapid growth of immigrant communities and their institutionalization forced to talk about "the diasporaization of the world" as one of the scenarios for the development of mankind. One way or another, this process deepens and takes more and more new forms, and the role of Diasporas and their influence are intensified.

Migration to abroad indeed brings good-feel factor, but there is emotional crisis of self and nationality. There is a discovery of one's " Self " as the center of human existence and for interdependence. Because of " Videsiya bhav " , lots of narratives, memoirs, letters, and travelogues have been written to search roots of nativity, belongingness in their imagination. Besides manifestation, it is the catharsis of their wings/flight. With their spatial paradigms, the novelists go beyond the past.

They perceive present by way of imaginary construction of memory, nostalgia, and myth in order to dispossess the past. To remove the sense of otherness, they eliminate western standardization and reorient their cultural tradition. The paper aims to interrogate the human displacement across borders and rupture in relationships. The study attempts to sensitize the migrants' memories and emotional loss and to understand mobility in terms of the social structure and cultural process. It examines Western psyche with Indian psyche in a context of the emotional history of migrants. The stories of emotional disposition, remembrance, missing, searching evoke

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resilient attitude towards one's own and towards the place they live. Emotion is a child like activity for Indian migrants as well as for those who are left behind in their motherland.

India has largest diaspora population in world: UN Report. According to UN World Migration Report (2018) Indian diaspora is world's largest, with slightly more than 15.6 million people from India living overseas

**Home away from home:** Where Indians go

| Rank | Country | No of Indians (in million) | % of total Indian diaspora |
|---|---|---|---|
| 1 | UAE | 3.5 | 22.4 |
| 2 | US | 2.0 | 12.8 |
| 3 | Saudi Arabia | 1.9 | 12.1 |
| 4 | Kuwait | 1.0 | 6.4 |
| 5 | Oman | 0.7 | 4.5 |
| 6 | UK | 0.7 | 4.5 |
| 7 | Qatar | 0.6 | 3.8 |

Total 15.6 million

**Top 7** destination countries for global diaspora

| | | No of international migrants (in million) |
|---|---|---|
| 1 | US | 46.6 |
| 2 | Germany | 12.0 |
| 3 | Russia | 11.6 |
| 4 | Saudi Arabia | 10.0 |
| 5 | UK | 8.5 |
| 6 | UAE | 8.0 |
| 7 | Canada | 7.8 |

**Top 7** countries of origin for global diaspora

| | | No of international migrants (in million) |
|---|---|---|
| 1 | India | 15.6 |
| 2 | Mexico | 12.3 |
| 3 | Russia | 10.6 |
| 4 | China (+ Hong Kong) | 10.5 |
| 5 | Bangladesh | 7.2 |
| 6 | Pakistan | 5.9 |
| 7 | Ukraine | 5.8 |

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# WILD ONE: A SOCIO- PSYCHOLOGICAL APPROACH

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**ABSTRACT**
*Ismat Chugtai's 'Wild One' translated from Urdu Ziddi by Jahira Naqvi is a popular Love tragedy caused by Social division and discrimination, especially casteism and sexualism . The paper attempts to explore the tendency which is exploitive not only to an individual but also to the society as a whole. The paper explores the socio- psychological impact of discrimination through the protagonist Puran.*

*Keywords: Love, Tragety, revenge, social justice.*

## INTRODUCTION

Ismat Chughtai is one of the pillars of modern Urdu fiction. She has published Novels, Short Stories, and Screen Plays and has been awarded Padma Shree in 1976 and Ghalib Award in 1984. His outstanding works include famous books like My Friend, My Enemy, A Life in Words, Lifting the Veil, The Crooked Line. The main concern in her works has been Social Divisions, Female Sexuality, Class mentality, Desires and Oppression.

This novella "The Wild One" is set in Independent India, where the cast order still has its hold on Community social life. The Novel is an interplay of conflict between individual choice and social mores that has more validity above the other. Our Protagonist Puran, a young handsome, royal bred has just returned home after completing his higher education and is now preparing for competitive exams to take up government job in future. Full of nature and mischief Puran keeps provoking people around him, usually his bhabi and servants like Chamki, Bhola's aunt and Asha.

Chamki is attracted to Purans ways and secretly pampers love for him. But, Puran is slowly drawn towards Asha whom he has brought to stay in Raja Sahebs mension after the death of Asha's maternal granmother, who has reserved as nurse for four generations of Raja Sahib household. While on her death bed Asha's grandmother addressed Puran in the following words -

Listen, my dear child…. Asha, my
Daughter, she's a very good girl, I've
taken special care of her…. take her to
Raja Sahib, don't make her unhappy,
Find a nice boy for her to marry….
People are all the family she has now

(Pg.81, Chughtai's Quartet)

So Puran feels responsible for Asha and also objects Bhabi in the following words, if she gives chores to Asha -

Asha is not our servant, Bhabi,
Why do you make her work?
Why, don't we do any work?

(Pg.85, Chugtai Quartet)

Though, Asha is poor and outcaste, she enjoys the affection of Bhabi and other members of Raja Sahib's family that she soon forgets her gloomy past and comes in terms with life. Mataji (Purans mother) and Raja Sahib are more confined to their room, and spend much of their time in prays. Puran's eldest brother (Bhaiya Arun) is conservative and manages the jagir i.e. the estate affairs, while his wife a representation of royal bahu, delicately beautiful and mischievous who juggles between managing the house and her children Sheela, Nirmal and Munna . After marriage, Puran was the first with whom bhabi has confined. Puran playfully teased bhabi by pulling Munna's cheeks and turning them to red or by flunging him in air but Munna seemed to enjoy the feast. Bhabi often doted on her brother Mahesh, who was handsome and married with two children. But the tragedy results when the story twists when Puran declares his love for Asha before bhaiya .

The caste system even today after seventy two years of independence, controls life in India and the same happened in the story. Faced with severe family opposition from marrying Asha ,Puran is prepared to face challenges in love . He has even made up his mind to make a legacy from nothingness, but not to forsake Asha's love. Concerned about family prestige, questions like ; How they will face the society ? or How will Kamala's in- Laws react ? or Which good family will send proposal for Sheela when she grows up? or Who

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will give their daughter's hand to Nirmal in marriage? Worried by all such thoughts Mataji and Bhaiya secretly conspire to send Asha away from Puran Singh's life to stay with Kamala Devi his sister. Whereas on the other hand Purana is convinced that Asha has willingly left him as she didn't want to bring disgrace to the family and does not want him to persue her. Later in life , Puran is informed that Asha is dead in plague that swallowed her entire village. This tragic news shatters Puran, who has now changed to a different man, who no longer cherished life , stays withdrawn and lost .

According to psychologist, the impact of deprival in love varies from individual to individual. Everyman is not practical to compromise with situation and move ahead in life. Loss of love reduced Purana to himself who neither takes interest in things nor anything interests him. Purana deterioration and self neglect worries Raja Sahebs family and so Mataji , just like a concerned mother feels necessary to get Puran married, so that once again when love smiles at him, Purana life will bloom as before. Mataji gives reference of her love and convinces Purana to give concent in marring Shanta, Kamala's sister in law. . She says –

Puran, my dearest…..
will take this longing with me
to the grave? I have two sons,
and one won't be married while
I'm alive?

(Pg. 129, Chughtai's Quartet)

Emotionally blackmailed, Puran bends to Mataji's will and ties a knot with Shamta but who knows what predent has in store and right after the marriage and the tent fire, Purana suddenly comes across Asha and his illusion clears about how the family conspired to keep him away from Asha? And How he was toyed by his own family? On seeing Asha he addressed his emotions in the following words-

You can't leave me now he said,
Clutching her to his breast. Tell me,
was thi a conspirary? Now I
understand, now I know! But the
game is over. Asha let's run away
from this vile world, lets us go.

( Chughtai's Quartet)

But, once again the prodigy interplays and Sham Lal strays Asha from Purana life by threatning her of his marriage to Shanta and also that if she doesn't budge she has to sacrifice on Puran Singh's life. The society is often unfair to the weaks, and so was the case with Asha, She was forced to move out of Puran life, every time they came together, Sometimes in the name of society, caste, class, sexualism etc. The individual happiness is often sacrificed to the orthodox social customes and traditions.

Puran is once again jolted, when he returns to find Asha has left, bereft in pain he falls flat to the ground and the fever grips him for day's together. Puran who is psychologically lost is disheartened with his family politics and decides to revenge his own life as a form of revolt against his own people for puppeting him. Also from our real life, we know that individual who fail in love face extreme psychological trauma which sometimes results in crime against themselves or those responsible. Such patients need clinical treatment and support from family and friends. Purans family failed to notice these psychological symptoms which took the form of frequent fever and headache in him. Inspite of regular treatment Purans body did not respond to the medicines and his condition further deteriorated as the wounds were psychological. Asha was the only one who could have saved his life but she was called in by Bhaiya when all hopes of Puran life had died off. A right step on time could have saved Purans life.

The tragedy not only involved Purans life but also others related to him. Though married to Shanta , Puran's heart never accepted her as his wife. Nevertheless after suffering love pangs for two years Shanta sought refuge by develoing illicit relations with Mahesh and ultimately absconded with him.

Now, the question once again posed is , Who will ask for Sheela's hand when she grows up? Has this incident not brought shame, damaged family image and ruined the lives of innocent people involved ? Won't now the society be held responsible for destroying families. Who care ? People forget and many Puran and Asha's are sacrificed in the name of false customes and traditions. The saying rightly goes , "Take control of today and tomorrow will take it's own Care". All crises could have been averted, only if the family would have thought rationally and supported Puran's decision to marry Asha .

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On seeking Puran reduced to a skeletal frame, Asha still embraces him. She recalls Puran in thr past, handsome with dashing hair and sparkle in his eyes. She could not imagine life without Puran, her head Swam as if violently flunge reveral times. Finally, Asha sati's herself and Puran before his dead bed in the close room.

This tragic end is an inspiration that we should cherish life and never sacrifice our happiness to unreasonable authodox society.The choice of life partner is personal and needs to be judicially made taking the family members in confidence. Even when there are family opposition, the individual right to choose has constitutional support and provision.

I conclude that if the nation has to progress then the society has to shrunk all that is orthodox and invalid and value individual right to life and decisions.

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# BEHAVIOURAL STUDIES OF *BOLEOPHTHALMUS DUSSUMIERI* (VAL., 1837) ON THE SILTED INTERTIDAL MUDFLATS OF ULHAS RIVER ESTUARY

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## ABSTRACT
*Ulhas River Estuary (URE) sediment is highly silted. Boleophthalmus dussumieri (Val., 1837) is a mudskipper species of a common occurrence on the intertidal mudflats developed on either banks of URE. The present study recorded the various activities like burrow construction, feeding, territoriality and courtship, of B. dussumieri using scan and focal sampling method on the surface during tidal movements on the exposed mudflats of URE near Kolshet creek. Although the breeding and territoriality of B. dussumieri being normal, the other behavioral activities such as courtship, construction of burrows and survivorship were different as compared to the earlier observations by various experts. Breeding pairs preferred to develop burrows at spring tide limits. Burrows lacked chimneys and pit-pools. Juveniles remained without burrows and were found to secure position by penetration in loose soil during flood tide. Feeding on muddy surface was performed by strange straining behaviour.*

*Keywords: Boleophthalmus dussumieri, mudskipper, tidal oscillation, Ulhas river estuary, courtship, territoriality, feeding behavior, breeding behaviour, courtship, burrows, mudflats, siltation, silt, pollution, soil texture.*

## INTRODUCTION
**i.** Mudskippers are well-known for their amphibious and bentho-fossorial habit often found for courtship and feeding vigorously on the exposed mud flats of coastal waters (Clayton, 1993). Ishimatsu and Graham (2011) recorded that mudskippers burrows are highly variable in structures even within a species. They were recorded as biological indicators for environmental monitoring of coastal marine waters (Ansari, et al., 2014). Ikebe and Oishi (1996) correlated environmental parameters with behaviour of *Periophthalmus modestus.* Ulhas River estuary (URE) is located in the vicinity of Thane City near Mumbai, Maharashtra State, India. URE is well known for its rich and diverse fisheries from decades supporting a considerable fishermen population of the area. Mudskipper fishery is highly popular since it was earlier supported by three important species viz. *Boleophthalmus dussumieri* (Val., 1837), *Boleophthalmus boddarti* (Pallas, 1770) and *Taenioides cirratus* (Blyth, 1860) locally known as '*niwati*', '*chitti*' and '*waati*' respectively (Rathod, 2005).

*B. dussumieri* is abundant species of mudskipper inhabiting on the intertidal mudflats of Ulhas River estuary (URE). *B. dussumieri* contribute to one of the important and highly priced fishery species along URE. *B. dussumieri* has been studied considerably from URE for its breeding and feeding behaviour (Mutsaddi and Bal, 1973; Rathod and Patil, 2009).They maintain the burrows and exhibit intense territoriality on the mudflats of URE (Mutsaddi and Bal, 1973; Rathod, 2005). Their burrows are often open with slight elevation, sort of chimney and are located in the tiny pit-pools constructed of earth to retain water during low tide. They keep their tail immersed in this water for moistening their body surface so as to expedite the respiration through skin when they are exposed to air (Mutsaddi and Bal, 1973; Clayton, 1993; Yee, 1996).

**Fig-1: Satellite images of the Ulhas River estuary and Sampling Station**


Ulhas River Estuary showing locations of three soil sampling stations-1, 2 & 3 at upper, middle and lower reaches respectively. Kolshet Creek (station 1) located near Thane City of Maharashtra State in India, between Latitude 19.228794N and Longitude 72.982963E on the world map showing the study station where *B. dussumieri* on the mudflats are of common site.

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## MATERIALS AND METHODS

ii. **Study area:** Bimonthly observations of various behavioral patterns of *B. dussumieri* and monthly sediment sampling were carried out. The ambient specimens were observed at 'Kolshet' creek station '1' situated in the upper stretch of the Ulhas river estuary, lying between latitude 1914'49"N and longitude 7259'50" E from the months of November 2015 through April 2016 to record various behavioral activities like feeding, territoriality, construction of burrows, courtship, and survivorship on the exposed mudflats of approx. 100 sq. m (10 m x10 m) area of Ulhas River estuary (Fig.1). Soil samples on monthly basis were collected from three stations from mudflats along (1) head of the estuary near study area at Kolshet creek (2) from middle region 7.8 km away from station 1 at Versova bridge and (3) from downstream of the estuary nearly 13.6 km away from station 1 at Ghodbunder sand landing centre (Fig. 1).

iii. **Analysis of silt:** Silt was analyzed using Buchanan's pipette method (1984).

iv. **Behavioural Study:** The behavioral observation of the *B. dussumieri* was accomplished using *scan and focal sampling* method (Altmann 1974; Bowden *et* al. 2008 and Gilby *et* al. 2010) during the low tide at the foresaid study station for a period of four months (Fig.1). Diminutive behavioral patterns were recorded with help of 'Sony' Handy-cam (a movie-cum-photography camera) model: HDR-CX130E, to produce appropriate images and videos. The videos were used to support and revise the observations recorded on field. In present study, four aspects were ordained to understand the behaviour of the *B. dussumieri* on the selected mudflat during the present study viz. (1) siltation and its impact on the burrowing behaviour of the mudskipper; (2) feeding behaviour and (3) territoriality and courtship behaviour.

## RESULT AND DISCUSSION

### i. Siltation and its impact on the burrowing bahaviour

Siltation was profound in URE towards mouth and middle region with 47. 92% and 45.99% silt respectively, on an average of 46.95%, during present study. This is probably pertaining to the higher sand-dredging activities in the middle and lower regions during the study period. However, the siltation was near 31.26% at head of the estuary (Fig 2). Although the station 1 showed comparatively low silt percentage the silt above 30% is considered as disturbed condition (Hossain *et al*., 2014). According to Rathod (2016), overall the sediment structure of URE was **clay to silty-clay type** (Fig. 3)**.**

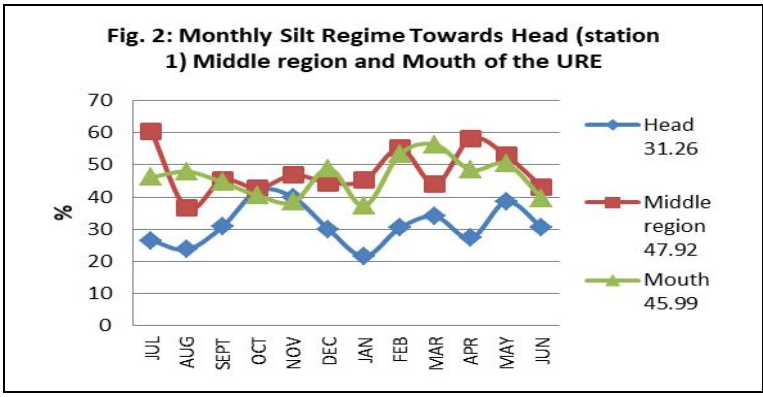
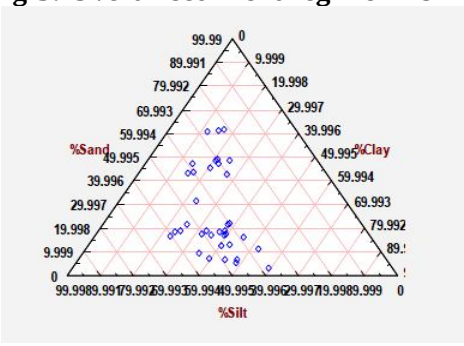



**Fig-3: Overall sediment regime in URE**




According to some experts, normally the burrows of *B. dussumieri* are guarded by a pit-pool to retain water around the orifice in which the individual immerses its tail to keep body wet for the purpose of cutaneous respiration (Clayton, 1993; Al-Behbehani and Ebrahim, 2010). Also the burrow orifice is elevated in a conical mound of mud like a chimney. However, in present study the burrows of *B. dussumieri* developed on the mudflats of near Kolshet creek (sampling station) did not have any 'chimney', as such or the pit-pool. Probably it was not possible due to high siltation which decreases the loamy nature of the soil not sufficient to render consistency to build pits. In such cases the individuals instead, remained in the vicinity of tiny water streams occurred on the surfaces or available natural pits for moistening their skin, required for respiration (Fig. 4-i). Individuals were also found otherwise, to roll on the wet soil for moistening their skin to ensure the cutaneous respiration (Fig. 4-iii).

It has been observed that the present siltation hindered the construction of burrows which probably affected the successful breeding of the *B. dussumieri* in the ambient water body. Consequently, the mature individuals in the study area were found to confine their burrows to upper intertidal limits (above the line of daily tidal levels which occasionally covered during spring tide only) during the study period (Fig. 4-ii). This might be for securing the burrow from getting demolished by tidal current. This kind of adaptation in mudskippers discerned that this helped them to attain breeding between the two subsequent spring tides.

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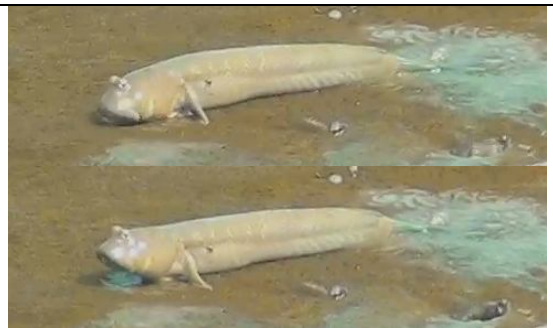
**Fig. 4: General behaviour of individuals after exposure of their burrows.**

i. Pit-pool filled with water



ii. Burrows distant from the daily tidal lines.

iii. Rolling behaviour for skin moistening

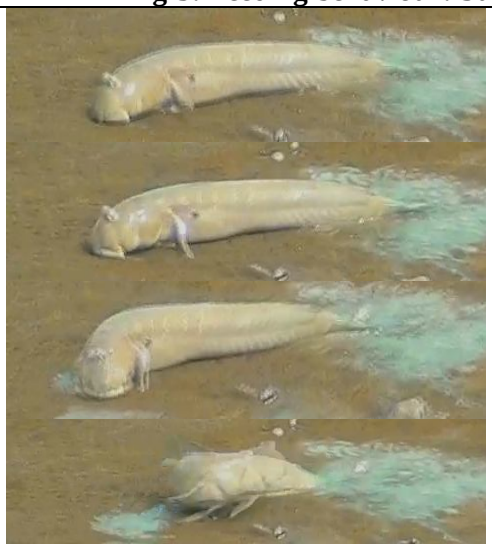
i. Pit-pool filled with water during low tide often used as source of water for respiration and feeding. The water was however used after every feeding attempt probably for winnowing the diatom.
ii. Mature individuals developed burrows distant from the daily tidal (upper intertidal) lines perhaps to get the firm substratum for courtship activities and secured burrows.
iii. Mature individuals were found rolling on the moist ground to ensure skin moistening as their burrows built on extra tidal limits and hence lacked water.

Young ones of *B. dussumieri* possessed no burrows and were observed penetrating into the loose soil during high tide inundations. This might be helping them to avoid from getting swiped away due to tidal currents from their home area. It was of common sight that nearly 3-4 hours of exposure of mudflat during low-tide rendered the surface harder. This made difficult for young-ones to penetrate their body in the loose soil beneath. To cope up with this difficulty they were observed to fetch water in mouth from the available nearby pits and apply it on the hardened surface smartly to soften it before they wriggled their body downwards. This activity also attributes to the siltation in the region which hindered the construction of burrows.

**ii. Feeding Behaviour**

B. dussumieri are known for surficial feeding on diatoms (Mutsaddi and Bal, 1969; Rathod and Patil, 2009;). Feeding was performed by swinging head keeping mouth wide open close to hardened ground wiping the surface to collect food (Fig. 5-i). Juveniles collected food from wet soil and were observed to visit available pits to clean the same by straining action.

**Fig-5: Feeding behaviour: Surficial head swiping and straining behaviour**



i. Side-to-side head movement

ii. Winnowing behaviour

i. Side-to-side swinging of head while feeding. The individual touches to surface with mouth open-wide produced into funnel of lips and swipe its head side to side collecting diatoms.
ii. Frequent visit to water for winnowing the diatoms in mouth.

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**iii. Territoriality and Courtship Behaviour**

According to Mutsaddi and Bal (1970) the reproductive cycle of **Boleophthalmus dussumieri** from Bombay (19°N) revealed the period of active maturation (gonadal stages IV—VI) lasted from February to May in males and March to June in females and the fish spawn once a year over the period July to September. This corroborates with the population included more of younger individuals of *B. dussumieri* during the month of November in present study. Specimens were found in fully mature condition towards the month of January to February. Likewise, the sexual pairing occurred during the latter part of the study period i.e. in the month of February to March. Pairing of the individuals occurred very frequently during the month of February, in present study. During courtship, the individuals were restricting themselves very close to their burrows to ensure the escape from threat. Usually there were two entrances (openings) on a single burrow on an average distance of 1.5 feet which were little different in size, one was smaller than the other. Although both male and female resided in same burrow however, the males preferred the one which was bigger opening and female, the smaller. Males were dominant and possessive of females; males did not allow female to stray away from the burrow and forced them to remain in confinement by frequent chasing.

**Fig. 6: Breeding habit: Territoriality and courtship behaviour**

i. Equidistance territories

ii. Alert and vigilant individual protecting its burrow in exposed condition during low tide.


iii. Mates build separate openings of burrow in the neighborhood.

A. Nests are built at a regular distance from each other to form equidistance territories which are vigorously protected from neighbours.

B. Alert and vigilant individual protecting its burrow in exposed condition during low tide.

C. Mates of opposite sex have separate openings of same burrow. Male uses bigger opening while female, the smaller. Males often try to push female in the burrow to avoid her from eloping.

## CONCLUSION

*B. dussumieri* is highly adapted to the present conditions. Adult *B. dussumieri* were unable to build chimneys and pit-pools around their burrows due to the highly silted soil of ambient mudflats. They preferred peripheral hardened mudflats which were inundated during spring tides. Siltation probably hindered the breeding. However, the individuals who developed burrows at spring tide limits involved courtship actively. Dominant male forced female in confinement. Although male and female both remained in same burrow they used separate (personal) openings for exit and entry. Juveniles remained without burrows and were found to penetrating in mud during high tide, using water for softening the dried surface, to secure position.

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# TO STUDY THE $P^H$ OF HUMAN SCALP AND VARIOUS BRANDS OF SHAMPOOS

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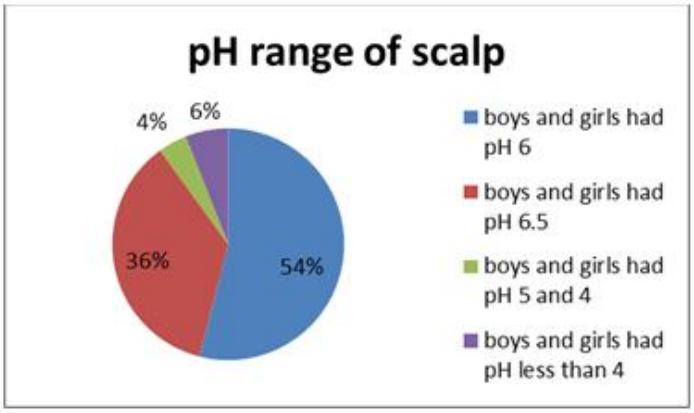
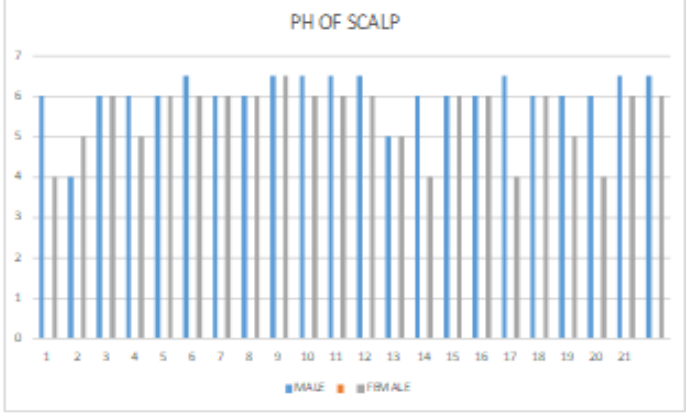
## ABSTRACT
*The hair is symbol of beauty in both the genders of human beings. Long, healthy, voluminous hair have been referred as the beautiful woman may be Rapunzel of fairy land or Shakuntala from Indian epics. Various factors like nutrition, stress, sleep cycle, water quality, and environment and genetic affects the hair and the scalp quality. Uncared hair, use of different hair products can lead to hair loss, baldness.In present paper we are discussing about scalp pH and shampoos. With simple techniques, it easy to analyze pH of the scalp and shampoos.The sale of various hair products is raising enormously, from which the shampoos are enormously used to wash hair despite the huge cost, Without understanding the suitability and the pH of shampoos used to wash hair. Woman use multiple brands of shampoo then men.*

## INTRODUCTION
Health care services are rendered in all sectors including the clinics of hair grow ,transplant, hair treatment, is rising since last decade. Earning popularity and is a demanding sector. People get lured by advertisements of such clinics since Hair loss, Baldness are rising to alarming levels in both the genders. The loss of hair can be due to poor nutrition, genetic factors, hormonal imbalance, stress, water quality used to wash hair, hair care products. However few applications are available to diagnose scalp and hair. Human hair ,scalp oil, sebum, has a pH balance of between 4.5 and 5.5. This natural hair acidity prevents fungi and bacteria in the hair and scalp, and keeps the cuticle closed and healthy. Many of the hair products that people use disrupt the natural pH of the hair. A substance that is too alkaline will cause the hair cuticle to open, while a substance that is too acidic will cause the cuticle to contract.the texture of hair varies from curly, frizzy, wavy, to straight.this determine the moisture content in the hair curly hair holds less moisture, curly and straight hair thickness

## MATERIAL AND METHOD
We checked $p^H$of scalp from 22 girls and 22 boys age group 17 to 19, by pH paper. Also we checked $p^H$ from 33brands of shampoos, using universal indicator and $p^H$ paper. Girls having hair wash thrice a week boys almost every day, Using shampoo of different brands. The Calculations are done by percentage method.

## OBSERVATIONS



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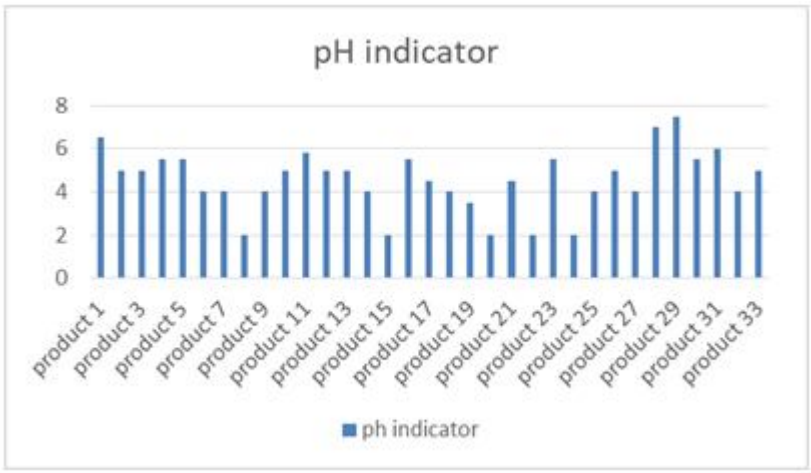


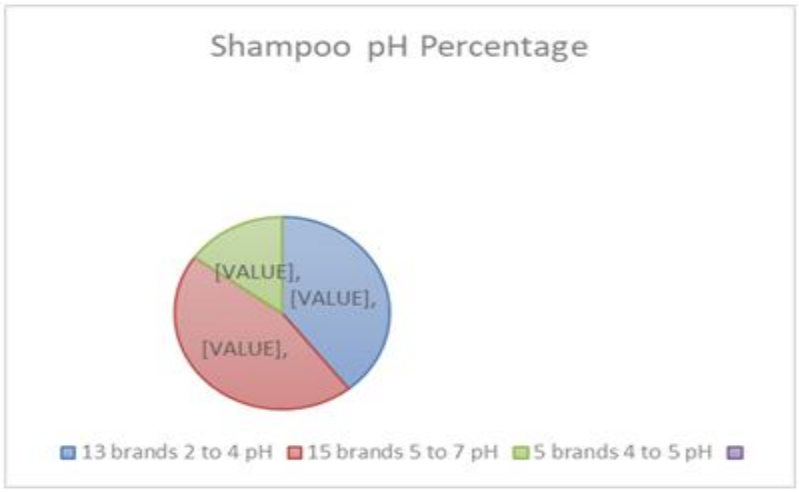


**RESULTS AND DISCUSSION**

Hair is the indicator of the overall health and wellness so, most people wish to know whether hair scalp analysis is essential if they need to solve their hair scalp issues. Unfortunately Hair is care is not taken seriously until a remarkable decrease in hair density or a receding hairline – both falling under the category of thinning hair and/or baldness is observed. Hair is no longer considered as a mere extension of the human anatomy; it has metamorphosed into an important accessory that reflects the inner as well as external personality of a person. While healthy hair may have unrealised benefits, loss of hair can severely bruise a person's ego and lower esteem, more so if it happens at an early age.(info@segalsolutionsindia.com).

Alkaline pH of shampoo may increase the negative electrical charge of the hair fiber surface and, therefore, increase friction between the fibers. This may lead to cuticle damage by opening the cuticle ther by increasing the chance of entry of bacteria, fungus and also fiber breakage. It is a reality that lower pH of shampoos may cause less frizzing for generating less negative static electricity on the fiber surface. in our observation 45% of the brand shampoos had pH ranging from 5-7, which is the recommended pH to use for hair wash, 39% brand had pH below 4 and 15% brands had pH range between 4-5 this will cause closing or narrowing of the hair cuticle, however according to Maria etal (2014), 75% of the salons shampoos presented a pH $\leq$ 5.0. Pediatric shampoos had the pH of 7.0 because of the "no-tear" concept. There is no standardized value for the final pH. It is important to reveal the pH value on the shampoo label, but studies are needed to establish the best pH range for both the scalp and the hair fiber's health. Most of the analyzed products have a final pH higher than the hair shaft pH of 3.6 and even higher than the scalp pH of 5.5. There are no standardized pH for any specific indication of hair shampoo, either commercial/popular, antidandruff or dermatologically prescribed products.it is necessary to choose a shampoo with pH lower than 5.5.(Maria Fernanda Reis Gavazzoni Dias, AndréiaMunck de Almeida,Patricia Makino RezendeCecato, Andre Ricardo Adriano, and Janine Pichler 2014) Regarding the pediatrics shampoos, one can attribute the higher pH (100% of the samples had a pH higher than 6.0) encountered in the samples, to the fact that they have a major concern "no tears" concept rather than conditioning the hair fiber or the hair scalp. (Persaud D, Kamath YK.. 2004) That is why the shampoo pH is closer to the tear physiological pH, it is believed that adults with dyed hair shaft, especially bleached hair, should not use pediatric shampoos to cleanse and condition their hair.

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## CONCLUSION

The cuticle layer tightens and contracts when the value drops down below 6,thus using a conditioner with a pH lower than 7, which is mildly acidic, can smoothen the surface and add shine to the hair. It reflects light but is still prone to damage due to the strong acid. Colouring hair is trend of fashion, Coloured hair should be washed with low pH shampoo, pH levels that are 7.0 and above, alkaline range where the layer of the cuticle expands and softens. (https://regrowz.com).The pigments are deposited into the hair during the colouring process when alkaline levels are higher, this can be damaging. Since hair is porous, it does not retain the colour and the new pigmentation will not be held properly and tends to fall out prematurely and also leading to overproduction of sebum .Also the manufacturers should prescribe pH on the shampoo

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# ARTIFICIAL INTELLIGENCE (AI): RESHAPING FUTURE BANKING IN INDIA

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## INTRODUCTION

Artificial Intelligence, which is otherwise called a machine or robotic intelligence, means the ability of machines and robots to think and perform a task by themselves without the involvement of humans. It's done through technologies like Machine Learning, NLP, Deep learning, speech recognition, image analysis, and so forth. By aggregating, organising and analysing the large quantity of data, AI can contribute lots of things for the growth and development of the country. (Oxford dictionary)

India is the seventh largest economy in the world in terms of GDP. After the economic liberalisation in 1991, India achieved a 6-7 % average GDP growth annually. [Ministry of Statistics and Programme implementation MOSPI] Since 2014, with exception of 2017, India's economy has been the world's fastest-growing major economy surpassing China. In 2018 India achieved 7 percent GDP growth [MOSPI) Banks play a vital role in the growth of India. Especially making people in rural areas and weaker sections part of banking which in turn help our nation in its economic empowerment. The primary focus of the banks is to provide to all individuals and corporations, and with access to useful and economical banking services and products which meet their expectations yet are provided in a responsible and cost-reasonable way.

The banking system in India was started in the 18th century. As part of Joint-stock companies act in 1850, commercial banks had started in India. Companies act and Banking regulation act in 1949 can be said as a remarkable stage in the transformation of the banking sector. Reserve bank got the power of controlling NBFCs (Non-Banking Financial Company) through this. Nationalisation of banks. Liberalisation of the banking industry in 1980s and 1990 bring lot of changes in banking sector. Economic reforms in 1991 was another milestone in the growth of the banking sector. Recommendations of Narasimham committee guided a broad direction in the reforms of this sector.

The different types of banking institutions in India.

1. Apex banks & Development banks – IDBI, NABARD, EXIM Bank, SIDBI etc.
2. Commercial Banks – SBI, Canara Bank, Indian Bank, Private banks Such as Federal Bank, Kotak Mahindra, Foreign banks such as Standard Chartered Bank, Citibank, etc.
3. Rural Banks – Various regional rural banks (RRBs).
4. Investment Institutions – Insurance institutions, Credit guarantee institution, mutual funds, credit rating agencies etc
5. Cooperative banks- Ahmedabad Mercantile Co-operative Bank Ltd, Surat Peoples Co-Operative Bank Ltd., etc.
6. Developmental banks - State Finance Co-operation, ICICI, IFCI.
7. Mudra bank - Micro finance development and refinance banks.

As a part of continues reforms in banking sector new generation banks started its operations from 1993. They are banks in which a major share of the capital is in the hands of private individuals and institutions. E.g.: Axis Bank, HDFC etc. Presently, the Postal department has also introduced a financial service called India Post Payment Bank, which started its operations from 1st September 2018. It is propelled with a goal to provide banking service to both urban and rural, but the emphasis is on rural areas in India where the banking facility has not come to yet. So, changes and innovations are going on within the banking sector for making financial transactions straightforward, quick and reasonable to all sections of the society.

Artificial Intelligence (AI)has a great role in the banking sector as it stems out improved, efficient banking facilities which help them to achieve their goal effortlessly. AI is getting familiar with Indian banks. Some of the Indian banks such as SBI, Bank of Baroda, etc. begun utilising AI in their operations. Banking is one of the sectors which is seeing rapid adoption of AI. It will take away all the monotonicity, there is when it comes to banking, and use the huge amount of structured as well as unstructured data involved in banking processes which are being generated with exponentially increased mobile and internet usage, to improve the customer experience and increase efficiencies.

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AI is now used by foreign banks. Wells forgo, bank of America, Citi Bank, u. S bank etc are make use of ai in their banking system. (Kumba Sennar, 2019)

The following are five applications which banks can make use of Artificial Intelligence:

1. Credit scoring and loan management
2. Fraud detection and regulation
3. Risk management
4. Market data and research
5. Virtual customer service assistants.

**CREDIT SCORING AND LOAN MANAGEMENT**

Credit scoring is a measure used to evaluate the creditworthiness of a person. It is indicated in a numerical way based on the past credit history of a person. Banks check this credit score before giving a loan to an individual. It is done to reduce the loss to the bank due to non-repayment of the loan taken from them and that exist in the form of bad debt. CIBIL and Experian are two credit bureaus in India, which give credit scores. (S N Maheshwari, 2010) The Banks utilises credit score for loan management while authorising retail loans. Banks can utilise AI to ascertain creditworthiness of a person by analysing the credit score, account transactions, etc. Nowadays, we get pre-approved loan offers from the banks for which AI technologies are utilised for selecting the qualified people for such offers.

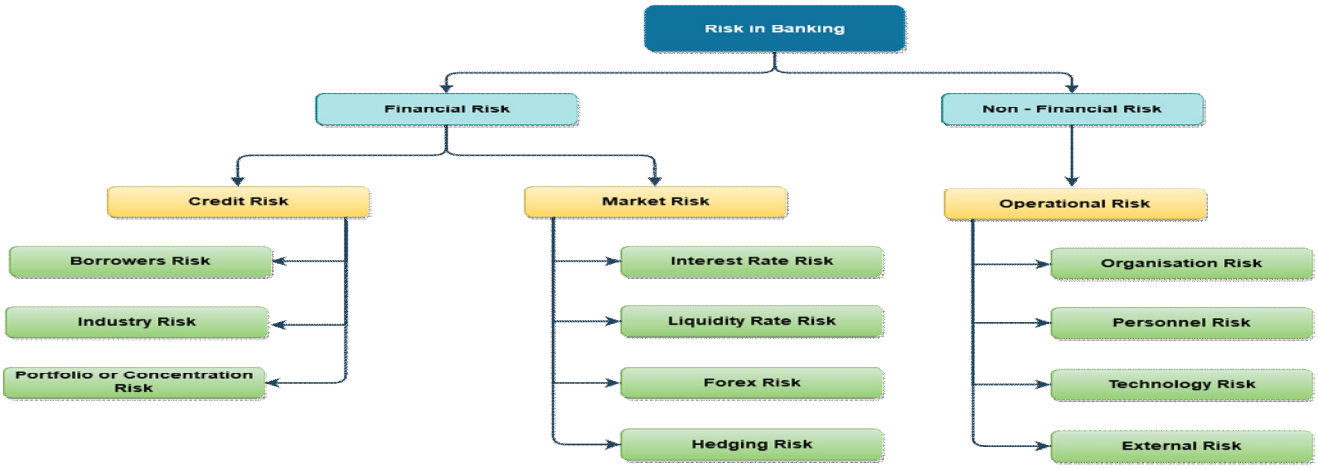
Recently, central Government announced facility of the business loan up to 1 crore to MSMEs in 59 minutes through SIDBI and 5 PSU Banks. The loans are undertaken without human intervention till sanction or disbursement stage. A user-friendly platform has been built where MSME borrower is not required to submit any physical document for in-principle approval. This solution uses sophisticated algorithms to read and analyse data points from various sources such as IT returns, GST data, bank statements, etc. in less than an hour while capturing the applicant's basic details using smart analysis from available documents. The system simplifies the decision-making process for a loan officer as the final output provides a summary of credit, valuation and verification on a user-friendly dashboard in real time.

There is a company called "Loan frame" which was founded In August 2015, headquarters at West Patel Nagar, Delhi. The company is a private, independent company which gives diversified financial services. It gives an idea about competitors, revenue, funding and acquisition and all details regarding the creditworthiness of a customer. Banks can also make use of this type of technology with the help of their IT department.

Shri Krishnamurthy Subramanian, CEA, Ministry of Finance, too points out that banks must utilise innovation to screen borrowers and monitor them while making a lending decision.

**RISK MANAGEMENT**

According to the dictionary of finance and banking "Risk management means forecasting and evaluation of financial risks together with the identification of procedures to avoid or minimize their impact." It involves various steps such as identification of problems, analyse them, control, transfer and reduce the chance of risk. Risk management is a new strategy for Indian banks. It covers the risk included in all the products and services given by the bank.




Source: Robert Wright (2012)

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Market or economic statistics are analysed assumptions are formed for controlling risk. AI can be used for its purpose. We cannot avoid risks, but we can manage them to an extent if we take precautions against them. AI can be used to oversee risks which we can identify. By using AI techniques, tailored products can be offered to clients by looking at historical data, doing risk analysis, and eliminating human errors from handcrafted models

**FRAUD DETECTION AND REGULATION**

Unfair or unlawful gain is called fraud. Fraud in banking can be of use of illegal ways to get money, or other properties from customers mainly depositors. Bank fraud is also called white-collar crime. There are different types of fraud activities are happening in banks. Some customers may do fraud accounting for getting more loans for the unprofitable firm for getting other benefits from the bank. This is called accounting fraud. There exists a chance of drawing fraudulent DD in banks. Such fraud is called Demand draft fraud. Uninsured deposits are another major fraud in banking, bill discounting fraud, skimming of card information forged document, etc. are some of the fraud activities in the bank.

AI can be used to control such fraud activities to an extent. Through AI bank can understand the nature &the characteristics of its customers and can able to know whether there will be any chance of such fraud practices. Nowadays banks have set up transaction monitoring departments which use AI techniques/algorithms to analyse the transactions of a customer. These applications trigger alerts to the branches/monitoring departments on the identification of suspicious transactions. Suspicious behaviour, logs analysis and spurious emails can be tracked down to prevent and possibly predict security breaches, Image/face recognition using real-time camera images and advanced AI techniques such as deep learning can be used at ATMs to detect and prevent frauds/crimes.

**MARKET INFORMATION AND RESEARCH**

Banks should have to update all its data and technology as the world demands else it will be outdated. Banks can make use of AI to do research and find out the possible changes that may happen. So that bank an easily adapts to the changes and thereby it can gain market leadership too. The market information system helps the manager in decision making helps to know about Government policies, competition, economic conditions, etc. Also, help to update the opportunities for better innovation.

Personalised portfolios can be managed by portfolio advisors for clients by considering lifestyles, an appetite for risk, expected returns on investment, etc.

**VIRTUAL CUSTOMER SERVICE ASSISTANT**

Virtual customer means a customer who uses the service from his location. There are agents for helping them known as a virtual agent. Virtual agents work from the employee's location. They interact with the customers through email or live chat boxes provided on the website. Most of the sectors including insurance sector appoint virtual agents to deal with the customers. The customer finds it comfortable and easy to deal with online banking activities when such systems are widely made use in banks. They can easily clarify their doubts if any, especially it will be a blessing to NRI customers. (Nitin Chugh and Sachin, 2019 Feb). Humanoid chatbot, a virtual assistant exactly like a trained human specialist, interfaces can be used to increase efficiency and reduce the cost for customer interactions.

**ADVANTAGES**

Aritificial Intelligence can provide many advantages to banking sector. It helps to improve customer experiences with the latest technology and maintain good customer relationships. Customer can make use of banking facilities from anywhere and at any time.They can clarify their doubts easily. It increases efficiency of banking transactions. AI takes away monotonicity. So that it can concentrate more on assets regulation which will increase profit. Also helps in Reduction in operating cost. Artificial intelligence helps to attract more customers to the banks, and it result in increased productivity.

The personalisation of data is possible. So, behaviour analysis can be done easily before transactions.Ensure more security on online transactions and against the risk to an extent. (Kulbhushan, 2018)

**CHALLENGES**

Like the two sides of coin it has some challenges too. The main challenges are

1. Availability of right data- Data is the lifeblood of AL. Vulnerability arising from unverified information is a serious concern for business. Imagine, for example, the risks that could arise from KYC compliances AI systems if data sources are incorrect. Or consider the efficiency of Fraud detection, AI system without the right kind of data. Structured mechanisms for collecting validating standardising correlating, archiving and distributing AL relevant data is crucial.

2. India has 150+ Languages with a sizeable spoken population. Applications which use speech to text or text to speech rely on natural language processing (NLP) libraries and techniques. Banks can use the existing technologies to start with to support some major Indian languages, but in order to effectively reach out to a wider population in India; much more program is required in NLP front.
3. The scarcity of trained human resources. The existing workforce is not familiar with the latest tools and applications.
4. AI technology is a big threat to redundant employees in the banking sector. The mass adoption of AI may cause a grave unemployment a problem.
5. Unavailability of people with right data skills. With only a small number of data scientists available to do AI work, the industry needs to work with universities in India to develop skilled data scientists as well as develop in-house training programs to train employees in data science skills.
6. Personal relations will be reduced. Banks create a platform of friendship with the officers etc it gets reduced. As it is said, when our technology develops our minds get shrinked. (Kulbhushan, 2018)

**CONCLUSION**

Wide implementation of high-end technology like AI in India is not going to be easy. Even though it has many challenges, big opportunities are waiting NITI Aayog chief Shri Rajiv Kumar also suggested for further banking reforms which is essential for economic growth of India. There is no doubt that the introduction of AI in Indian banking will reshape the future of the banking sector in the future (Navith, 2018). It will bring more opportunities to all the fields. Our country's economy also gets developed. Investment in AI means investment for future

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# Dr. MOHAMMAD HAMIDULLAH's THOUGHTS ON ISLAMIC LAW

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**ABSTRACT**
*Dr. Hamidullah was a great scholar and encyclopedic writer of Islamic guideline (law) . He contributed to all major aspects of Islamic guideline . His works are considered original and of high standard in the academic circle from the perspective of thorough utilization of sources, high caliber of material and basic methodology.*

*His contribution as a scholar of Islamic guideline had been remarkable. A part from translating the works of Islamic guideline into Urdu from different languages, he himself produced many important works on this subject. In these works he completely mentioned a range of aspects of Shariah and provided instructions in the new conditions of the existing day. The works provide solutions to the issues of socio-economic and political life. Here, I am discussing a few factors from them.*

*Keywords: Mohammad Hamidullah, Islamic guideline , Legislation, Amendment etc.*

## INTRODUCTION

Dr. Mohammad Hamidullah (1908A.D.-2002A.D.) was one amongst the eminent scholars of the Indian subcontinent who have left notable influence on the world through their extensive contributions to the Islam and superb offerings to the society at large. Although he belonged to Hyderabad (A.P., India) however he passed major parts of his life in Paris occupying himself with giving lectures and writing books on major religious subject matters mainly Quran, Hadith, Fiqh and Islamic history. His published works on these topics are about a hundred and fifty and have been universally identified in the educational circle from the factor of richness of fabric and high standered of research.[1]

As far as Islamic guideline is concerned, Dr. Hamidullah was a remarkable scholar and encyclopedic author of Islamic regulation. He contributed to all most important aspects of Islamic regulation and his works are regarded original and of excessive standard in the academic circle from the point of view of exhaustive use of sources, quality of material and critical approach.[2] His contribution as a scholar of Islamic regulation had been remarkable. A section from translating the works on Islamic regulation into Urdu from distinct languages, he himself produced many necessary works on this subject. In these works he wholly discussed extraordinary factors of Islamic regulation and supplied training in the new conditions of the current day world. The works supply Shariah mindset in the direction of many new factors of socio- economic and political life. Here, I am discussing a few points from them.[3]

## DEFINITION OF LAW

Dr. Mohammad Hamidullah defines the law as "the knowledge of what is for and upon one". In other words, the law signifies science of the rights and obligations of man[4]. At another place, he says that law means rule of conduct. But he further stated that every rule of conduct could not be part of law such as people do something under compulsion of their rulers, people act deliberately which are related to their own personal life and does not directly leave effect on the life of others, men act differently among themselves in their capacity of reasoning and choosing of an action etc.[5]

## ISLAMIC CONCEPTION OF LAW

In view of Dr. Mohammad Hamidullah, the Islamic conception of law may be derived from the Quranic verse:

(Seest thou not how Allah sets forth a parable? a goodly word like a goodly tree, whose root is firmly fixed, and its branches (reach) to the heavens).[6]

In other words, the source of Islamic code is a small seed but the tree which sprouts forth from it reaches the sky and its branches cover everything. If we consider the *Quran* and *Hadith* as the root or the seed, we shall see that the tree sprouting forth from it, has become so strong with all its sprawling branches, that it is capable to meet all human requirements until the end of time.[7]

## HIGHLIGHTS OF ISLAMIC GUIDELINE

Dr. Mohammad Hamidullah has examined vital aspects of Islamic guideline (law). As he would like to think the attributes of Islamic guideline may moreover be given as:

1. The Islamic guideline is based on the commands of Allah and it is quite different from man-made law. No human being is entitled to change it.[8]

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2. Islamic guideline comprehends all aspects of human life. It deals with belief, prayers (worships) as well as society, politics, economics, criminal law and International law.[9]
3. Every action of material life which is being discussed under Islamic guideline is a means to achieve the spiritual value. For example, the worship of Allah is manifestation of relation between the worshipper and Allah and this action which is governed in Islamic guideline is a means to seek spiritual advancement. In the same way, payment of *Zakat* shows relation between man and man, and this is also the means to seek spiritual value. Moreover, following the orders of a ruler is not only the obedience of the ruler but also means of acceptance of order of Allah and this action would bring reward of Allah for him.[10]
4. The scope of Islamic guideline is quit wide enough and its provisions are worthy to be applied in every period till the end of this world. The principle that makes it dynamic is *Ijtehad* which has the sanction of the Prophet Mohammad (SAW) as given in the *Hadith* of Hazrat Muaz Ibn Jabal(R.A.).[11]
5. The institution of Islam had never been under the exclusive control of ruler. It was actually under the jurisdiction of jurists or experts of Islamic guideline . Every jurist was required to express his opinion or deliver judgments in accordance with the *Quran* and *Hadith*. If he could not find the requisite guidance in any of these sources, he was permitted to decide cases through his own discretion or *qiyas*.[12]

If legislation or law-making had been under the purview of state or government, it would have resulted in a very complicated situation. In that case he says, Islamic guideline would have been influenced by the political requirements or expediency of the state. Suppose, one is the law minister, he will attempt to enact the law under the requirements of government. Since, he is in ruling party; his party members would not oppose his action. As a result of which, the law will be affected by the opinions of majority. However, in Islamic guideline every jurist is free to give his views. If a person express his views, it is easier for other person to criticize him and give a different opinion. The law made on the basis of this free discussion will be beneficial for government as well as its subjects.[13]

He further states that Islamic guideline governs both aspects of human life- material and spiritual. This is evident from the fact that the command for performance of prayer and payment of *Zakat* is given in the Holy *Qur'an* in a single verse:

(Establish service of worship and pay the tax, *Zakat*).

This means that when Islamic guideline ordains for the worship of Allah, at the same time, it also prescribes rules for paying *Zakat*. In short, we can say that Dr. Mohammad Hamidullah gives two main sections (spiritual and material) of Islamic guideline and in these two sections[14], the followings things are discussed.

Spiritual section: - 1. Belief 2. Acts of worship

Material section:- 1. Morals (*Akhlaq*) 2. Social and Economic Transaction[15]

**LEGISLATION AND AMENDMENT IN THE LAW**

As regards the administration of justice, Dr. Mohammad Hamidullah is of the opinion that it is based on two judicial officials: *Qazi* (Judge) and *mufti* (Jurist- consult). The *mufti* gives legal opinion about the concerned or disputed case and the *Qazi* delivers judgment with the regard to the case. *Qazi* and *mufti* were the main judicial officers of the Islamic state from very early period of Islamic history. Prophet Mohammad (SAW) appointed Abu Bakr (RA) as a *mufti* of Madinah and had told his companions that if any of them wanted to enquire about any legal problems, he should approach Hazrat Abu Bakr. Accordingly, companions used to consult him on legal matters. In cases about which ruling of the Prophet was available, Hazrat Abu Bakr merely reminded the companions about it[16]. Besides, in the same period, *Qazi* were also appointed outside of Madinah such as Hazrat Muaz Ibn Jabal as *Qazi* of Yemen.[17]

With regard to the changes in Islamic guideline (law), Dr. Mohammad Hamidullah was of the opinion that a law can be changed either by the law-maker himself or by an authority higher than him. No person of lesser authority can change the law. If Allah has given a command, He alone can change it. If the Prophet has pronounced a verdict, he or another Prophet can change it and indeed Allah may, but no person (other than a Prophet) can change a rule laid down by a Prophet. He, however, thought that a jurist was entitled to change or reject the legal opinion or verdict of another jurist.[18]

He further explains the same point in this way; this is an established principle that a law revealed by Allah cannot be changed by anyone except Him. No human being can change it. If he does so, he would be considered a non-believer. A Prophet can formulate rule about matters about which no clear guidance is available in the

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Holy *Quran*. When such law is made up by Prophet at the discretion, it can be subsequently changed only by another Prophet and not any other person of such as king, a jurist or a reformer. But Allah can amend or abrogate a law made by a Prophet.[19]

**ROMAN LAW VS ISLAMIC GUIDELINE (LAW)**

Sometimes, it is assumed that Islamic law has nothing in original and that many of its provisions are borrowed from the Roman law. According to some western scholars, when Islam came into contact with Byzantine Empire in Syria and Egypt, it adopted the law of Byzantine. Refuting this claim, Dr. Mohammad Hamidullah pointed out that the assumption of the influence of Roman law on Islamic guideline(law) can be ascertained only by a thorough study of the provisions of both the laws, otherwise such statements are unacceptable. In view of his findings, he came to the conclusion that in no way Islamic law borrowed anything from the Roman law. So, it is a mere conjecture to say that the Roman law influenced Islamic law. But it is surprising that inspite of his categorical denial for the influence of Roman law on Islamic law he held the view that in civil transactions (*Muamalat*), there appeared to be some influence of Roman law. According to him, it may be that during the early encounters of Muslims with the Roman people in Syria and Egypt, they would have been influenced by the Roman law prevailed there about mutual transactions. He categorically stated that there was no impact of the Roman law in devotional services (*Ibadat*), Penal law (*Hudud*), law of inheritance and the law relating to lending money (*Qarz*), marriage, divorce and legitimacy and international affairs.[20]

Moreover, Dr. Hamidullah also stressed that the contents of the books of Roman law might be divided under three parts- Persons, Property and Acts. On the other hand the works on Islamic law contained, first of all, chapters on *Ibadat* (prayer, fast, pilgrimage to Makkah and *Zakat*). This is followed by civil transactions (*Muamalat*) and criminal law. No book of Roman law had discussion on *Ibadat*.[21]

Further, there is lot of difference in the terminology of Islamic code and Roman law. For example, the Roman law uses the term Jus for law, while under Islamic code the term *Fiqh* is being used. *Jus* means "rights" and the word *Fiqh* means "to know" "to understand". The Muslims never used the term *jus* to define or interpret law. It may be also kept in view that the Roman law was written or codified in Latin and no Arabic translation of the Latin work on the Roman law was available till the second half of twentieth century. In short, Dr. Hamidullah' thought was that it was totally wrong to trace the origin of Islamic law from Roman law.[22]

**CONCLUSION**

From above discussion, it can be concluded that Dr. Hamidullah had a thorough knowledge of Islamic guideline that help to dispel the doubts created by the orientalists and other writers about different aspects of Islamic guideline . He impressed the western scholars to understand the importance and originality of Islamic law and to give up the false claim that it had borrowed many points from Roman law. In fact his discussion has placed the Islamic law on the higher pedestal. It can also be said that his works on Islamic law provide guidance to the Muslims in the new situations of the present day world. The works give *Shariats* attitude towards many new aspects of social, economic and political life.

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# UMBILICAL CORD STEM CELLS PRESERVATION: A BOON OF HEALTHY LIFESPAN - LETS CREATE AWARENESS!

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## ABSTRACT
*The present research paper talks about the importance preservation of SCs in today's competitive globe. One knows how to see that in today's competitive world people are facing many problems regarding their health issues. People cannot spare their time to pay attention to them as they wrongly indulged in unnecessary activities; in return they are suffering many types of disorders. Medical science has overcome these ailments with the help of research.*

*SCP boon of healthy life but problem is that people are not aware or have lake of knowledge regarding preservation of cells. The present work deals with the importance of SCP and trying to create its awareness in the society. Lack of proper awareness in the society through the medical research fraternity is not properly spread is generally observed. Same is happening in case of SCP. SCP Medical research is currently a boon for people and in the future a lot of other diseases can be a solution. For instance, few years ago people were having negative tendency about insurance, but after using proper promotional tool now they understood the importance of insurance. Same that this paper trying to create awareness in the society by using to apt marketing (Promotional) tool. "Prevention is Better Than Cure" SCP is ultimate hope for diseases.*

*Keyword: Stem Cells Preservation, Awareness, Social aspect*

*Abbreviation: stem cells preservation: SCP, Stem Cells: SCs*

## INTRODUCTION
One can see that in today's competitive world people are facing many problems regarding their health issues. People cannot spare their time to pay attention to them as they wrongly indulged in unnecessary activities; in return they are suffering many types of disorders. Medical science has overcome these ailments with the help of research.

One of the innovative researches of medical science is preservation of SCs which become cure for many disease. SCs are capable differentiating and regenerating into different type of cells in the human body. There is 3654 clinical trials are progress across the world around the application of SCs for the treatment of various diseases. Out of that 500 trials going on for Autism, Cerebral palsy, Stroke, Diabetes is currently underway growing in the scope of future treatments. In India 31 medical trials going on.

Outcome of the research SCs become cure for 80 blood related medical conditions such as Thalassemia, Lymphoma, Multipal Myeloma, Neuroblastoma etc. SCs are currently used in modern day medicine and can help in the treatment of many medical conditions through replacement and repair.

Lack of proper awareness in the society through the medical research fraternity is not properly spread is generally observed. Same is happening in case of SCP. SCP Medical research is currently a boon for people and in the future a lot of other diseases can be a solution. This paper trying to create awareness in the society for preservation of SCs. "**Prevention Is Better Than Cure"** SCP is ultimate provision for future diseases.

### What Are Stem Cells ?
SCs is like seed of tree gives rise to branches, leaves, flowers and fruit just like our body SCs which are similar to seed of tree also have the potential to develop into many different specialised cell type such as body cell, brain cell, heart cell, bone cell, liver cell, blood cell etc.

## OBJECTIVES
1. Imparting knowledge to the people about the significance of SCP.
2. To Study the existing situation related to the preservation of SCs and awareness among the community.
3. To vary the need for the greater acceptance of the SCP practices.
4. To identify the major reasons for SCP ignorance in the society.
5. To suggest measures to increase the number of participation of SCP.

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**WHAT IS STEM CELLS THERAPY?**

Preserved SCs are transplanting in body part where functions are damaged or affected by aging, injury or illness. So, that part of body started to regenerate organ. Because, SCs have ability to both replace affected cells and / or repair the affected parts and restore the normal function of our body. SCs preserved in SCs bank can be use in future to cure the disease by transplanting cells in the diseased target organ.

**Current Scenario Of Stem Cells Therapy:**

At present there 4658 successful therapies have done in world and in India there 54 therapies have done.

**Cost comparison of SCs therapy in India with other countries**

| PROCESS | INDIA | US | UK | SINGAPORE |
|---|---|---|---|---|
| CANCER | 7,00,000-10,00,000 | 19,50,000-57,20,000 | 876.95 – 900.85(crore) | 9,75,000-13,00,000 |

| PROCESS | INDIA | US | UK | SINGAPORE |
|---|---|---|---|---|
| SPINE CHORD | 4,42,000-6,50,000 | 20,15,000-25,00,000 | 93.29-100(crore) | 32,50,000-40,00,000 |

| PROCESS | INDIA | US | UK | SINGAPORE |
|---|---|---|---|---|
| HAIR LOSS | 7,80,000-9,00,000 | 29,25,000-32,00,000 | 186586-195696(crore) | 13,00,000-15,00,000 |

| PROCESS | INDIA | US | UK | SINGAPORE |
|---|---|---|---|---|
| KNEE REPLACEMENT | 4,42,000-5,50,000 | 6,50,000-9,00,000 | 233232-322323(crore) | 7,15,000-10,40,000 |

**NEED OF UMBILICAL CORD STEM CELLS PRESERVATION**

- ❖ Ability to Regenerate
- ❖ Life Saver for the entire Family
- ❖ Magical Cells in Medical Field
- ❖ Unique and Exclusive

**WHY UMBILICAL CORD PRESERVATION**

Umbilical cord (part of placenta that divers nutrients to a foeths) is a special bond between mother and son. Post delivery collecting and storing the blood from umbilical cord is not harmful to the baby. Umbilical cord and its blood is normally considered as medical waste. So, that medical waste we can store for human health / life. Medical research said that cord blood is believed to contain 10 times the amount of SCs found in bone marrow of an equal portion. Secondly, cord cells are very young cells so they have a greater ability to regenerate. The blood of Umbilical cord is a rich source of SCs.

**HYPOTHESIS**

**Hypothesis (H1):** "There is a need to create awareness in a society for Umbilical Cord Stem Cells Preservation."

**Hypothesis (H2):** "As Umbilical Cord Stem Cells Preservation is expensive hence certain financial aides should

be made available to the community to make this technique familiar."

**RESEARCH DESIGN**

- ❖ **Data Collection**
  - ➢ *Primary Data through Structured Questionnaire*
  - ➢ *Secondary Data from Stem Cell Preservations Bank websites, YouTube etc.*

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- **Data Analysis**
  - *For data analysis used Tables, Percentage Analysis*
- **Hypothesis Testing**
  - *On the basis of Percentage*

**Data Analysis**

| Q. NO. | QUESTIONS | NO | YES |
|---|---|---|---|
| 1. | Do you know about SCs? | 88.7% | 11.3% |
| 2. | Do you know what the uses of SCs are? | 88.7% | 11.3% |
| 3. | Do you know SCs are preserved? | 88.7% | 11.3% |
| 4. | Do you heard about stems transplantation therapy? | 75.4% | 24.6% |
| 5. | * If Yes, From where you got information about this therapy ? | | |
| 6. | **Why did not you do stem cell preservation? | | |

* A) Friends: 23.8 % B) Relatives: 1% C) Media: 33.33% D) Others Source: 38.1%

** A) Do not know the concept: 88.7% B) The placenta is preserved but in conventional way: 65.48%

C) Do not feel Caspian : 10.2% D) Resistance to Family:1.1%

| Q. NO. | QUESTIONS | NO | YES |
|---|---|---|---|
| 7. | Do you know any bank or place where the SCs are preserved? | 88.5% | 11.% |
| 8. | * Do you know any of your family member or relative or friend have adopted this therapy? | | |
| 9. | **What is the reason that you have not yet registered for stem cell preservation? | | |
| 10. | If you know the significations of this therapy will you go for SCP for your family or relatives? | 54.1% | 45.9% |
| 11. | Do you know about the cost of SCP? | 86.9% | 13.1% |

*A) **Yes:** 2.8% B) **No:** 72.6% C) **Don't Know:** 24.6%

**A) Do not know the concept: 75.4% B) Fear because the concept is not well known: 15.3%

C) Myths about the concept: 52.22% D) Superstitious: 53.55%

**OBSERVATIONS REGARDING UMBILICAL CORD STEM CELL PRESERVATION**

- More than 85 % don't have detail idea about this concept.
- 93% people have not yet done the SCP.
- 72.6 % people know about their relatives that they have not done SCP. 24.6 % people not sure about their familiar friends that they may have adopted or not adopted SCP. 2.8 % people said that their familiar member have adopted this therapy.
- The primary reason is people are not ready to preserve their SCs because lack of information. Second prominent reason is that superstitious mind sets of people regarding umbilical cords.
- 45.9% people are ready to preserve SCs after knowing about the importance of SCP. Even they are ready to suggest their friends and family about the umbilical cord SCP.

**FINDINGS REGARDING PRICING**

1) Preserved SCs can be used by the person in future to cure disease free of cost to his family members.
2) If they were not preserved then the cost to borrow from other person is 17 to 35 lacs excluding hospital charges.

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3) There is no encouragement by Government of India for SCP even there is no concession or subsidy.
4) There is no insurance coverage for SCP but some of the financial institutions provide funding for the same at 0% to 18% rate of interest.
5) It is expensive technique because of instruments and facilities required for the preservation of SCs are very expensive.
6) Cost of storage and cost of utilization is very high.

**SUGGESTIONS REGARDING PRICING**

- Government should adopt certain measures for the publicity of this therapy.
- Some sort of funding should be made available by the government.
- This issue should be taken over by various NGO's.
- Insurance companies should take initiative to provide insurance coverage for this therapy may not be whole coverage but at least with some percentage.

**FINDINGS REGARDING PLACE:**

As there is no green corridor system in India for easy transportation of SCs to the required centre from bank where they are preserved. Hence "**Location"** of SCs bank play key role in implementation of the system.

**SUGGESTIONS REGARDING PLACE**

Therefore, the location of preservation bank should be at convenient place so that within very short time the cells can be made available to the centre where they are required.

**FINDINGS REGARDING PROMOTION**

1. SCs of umbilical cord were preserved by the people in India by ancient time but they were not aware about the scientific use of SCs. It was done due to superstition and their misconceptions.
2. People are not aware about modern concept of preservation of SCs and significance.
3. Still there is fear and doubt in the mind of people regarding SCP as there is no proper marketing of this concept.
4. Any kind of measures for publicity regarding SCP is not under taken by State and Central Government of India.

**SUGGESTIONS REGARDING PROMOTION**

1. Through promotional tools awareness can be created among the people about SCP.
2. Fear in the mind of people can be abolishing through marketing tool such as advertisement, Publicity etc.
3. Government takes some initiatives to give publicity for preservation of SCs as well as financial assistance.

**CONTRIBUTION OF THE STUDY**

- Hence, this study proved that there is a need for promotion about this concept among the society.
- The motive of this study is to increase the number of inquiries of people so that SCP bank, financial institution, insurance companies, government , NGOs take initiatives to make positive schemes regarding this concept
- "Can give hope about the healthy life to the society."

**FUTURE ASPECT**

- Benefits of SCP is that it can give new life to all family members if need to be i.e. Grand Father and Mother, Father, Mother and Siblings.
- It will contribute to create job opportunity. It will support Indian economy.
- As social responsibility people who are economically sound can adopt the poor people in the community for stem cell preservation.

**CONCLUSION**

"Aarogyam Dhan Sampada", "Health is Wealth" these are most well known slogans in Sanskrit and English. Sound life is the real jewel. Hence SCP is "SANJEEVANI" for our healthy life.

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# VALIDITY AND RELIABILITY CONCERNS IN QUALITATIVE RESEARCH

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**ABSTRACT**
*The present research paper is based on the philosophical discussion of the concepts of validity and reliability in qualitative paradigm. How rigour needs to be maintained in qualitative research is deciphered through this article. The article is about the conceptual analysis of qualitative research and its authenticity. The discussion focuses on how rigor can be maintained in Qualitative Research. The main tools used for the research are, philosophical speculation and library research.*

*Keywords: Paradigms, Dynamics, Phenomenon, Qualitative, Quantitative, Research*

Research is basically a very unique and dynamic knowledge construction activity. Though various structures of research are available, yet it is very difficult to say that there is 'The Research Method'. In past few years, various paradigms have come up in research. In post-colonial times, researchers have explored other than positive paradigm of research. Critical theory, Hermeneutics, Phenomenological theories are rendering possibilities of many new paradigms in the Research. Similarly, many novel methods and tools have been designed by the Researchers. A few important names of scholars, exploring different dimensions of research activity are,

Maggi Savin-Baden, Claire Howell Major, Norman K. Denzin, Yvonna S. Lincoln, Uwe Flick,

In yesteryears, research was equated with quantitative methods. It used to get conducted mainly in positive paradigm. The trend is dominant even today which has given rise to new branches of sciences like Data Analytics. Application of statistics and numerical rigour decided the authenticity of the research.

However, when research was to be conducted on human beings and especially on human dynamics, scientists, in humanities, start facing various problems and also realised short-comings or incompleteness of positive paradigm and quantitative research. For example, if we want to know 'what is the impact of grief on human beings?' In such a situation, no quantitative method can help us to unravel the depth of this peculiar human experience. Sheer numbers do not explain many phenomena of human dynamics. Hence, naturally scholars started turning towards qualitative research method. Thanks to rigour of such scientists, who are genuinely trying to bring subtle human experiences in the purview of research.

## RESEARCH METHODOLOGY OF THE ARTICLE

The present article focuses to explore the validity and the reliability dimension of the qualitative research. The main objective of the paper is to describe and maintain how rigour and authenticity can be brought even in qualitative research. The method of critical analysis and philosophical speculation is being used for knowledge construction in this context.

## STAGES OF RESEARCH

**Any research happens at three levels.**

- **Data collections**: Data collection is accomplished through various tools such as questionnaires, interviews, observations and so on.
- **Data representation**: Proper Analysis and Interpretation of the collected data depends upon rigorous representation of the data. This is accomplished through the creation of transcripts, writing memos, converting audio visuals in transcripts, thick descriptions and so on.
- **Analysis and interpretation** of the data which gets culminated in knowledge construction.

In the present Article, the main point under discussion is qualitative data analysis, which directly affects the validity and reliability of knowledge constructed through qualitative data analysis. According to Shefali Pandya, quantitative data is mainly concerned with numbers and statistics, on the other hand, qualitative data, is mainly concerned with the meanings. Meaning patterns are generated through language or actions or also sometimes through images. In qualitative data analysis, data could be structured or unstructured. When the data is divided into separate units, describing the answers given by the participant to the closed ended questions then it is called as 'structured data'. But, in contrast to this, through open ended interviews free, descriptive responses are gathered as 'unstructured data'. It is neither codified nor classified.

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**The three main processes used for analysing qualitative data are as follows**

1. **Description** – In words of Shefali Pandya, 'to describe is to set forth in words, to recite the characteristics of the person, object or event' or sometimes even of a process. The first step in qualitative analysis is to develop comprehensive, honest descriptions of the phenomenon under consideration. This is called as thick description by Geerz and Denzin. Description may include the social context of the phenomenon, intention of the communication by participants and the process of description are very important. e,g, Giving thick description of intermingling of school children.
2. **Classification** – Classification consists in structuring qualitative data by breaking up data into parts and bits. Then bringing them together again in a new system. For example, content analysis. Classification of the data creates conceptual foundations for analysis. Classification is essentially a conceptual process. For example, if data is collected on women corporators through interviews, then classification may happen on the basis education, socio-economic background, personality traits and so on. Thus hundred woman corporators may get classified, now, into three groups. This essentially brings about system and conceptual clarity of data.
3. **Making Connections** - Concepts are the building blocks of analysis. In qualitative analysis, the most basic work is to build the concepts. For building or constructions, blocks or concepts need to be brought together in a systematic or a specific way. This precisely, brings us to the concept and the process of making connections. Theodore Brameld, talks about meaning patterns in a data. These meaning patterns are to be constructed by establishing relationships between different categories. Through this process of making connections, the scattered data gets the form of graphic representation, enriching the whole research endeavour.

There are three main basic approaches to qualitative data analysis. After applying the process, slowly and gradually the data gets converted into knowledge. For this process of knowledge construction three main approaches are used. They are

- **The language-based approach** – It focuses mainly on meaning of words and people's way of communicating language.
- **The interpretative approach** – This approach is rooted in phenomenology. It mainly focuses on social phenomena of the research participant. The concern is to describe and interpret a particular phenomena form the standpoint of research participant. For example, what a person undergoes when displaced from its roots due to development project. Or how a girl experiences, marriage transition.
- **Theory building approach** – This approach is based on identifying connections between social phenomena.

However, these three approaches are not water tight compartments, they merge into each other. Similarly, the process of data getting transformed into knowledge is also gradual. It doesn't have clear contours.

**RIGOUR IN QUALITATIVE ANALYSIS**

Certain principals need to be observed meticulously, in order to do thorough qualitative analysis.

- Proceeding very systematically with the data which would minimize human error.
- Construction of memos, journals, field notes etc.
- Focussing on the responses to research questions
- Simultaneous processes of enquiry and analysis.
- Evolutionary emergence of knowledge.

Qualitative research is conducted in various ways today. At all the three levels various types of qualitative analysis are used. For example, narrative analysis which is again of four types, or pure descriptive analysis, filming, textual analysis and so on.

**VALIDITY AND RELIABILITY OF QUALITATIVE RESEARCH**

The main concern in research is validity and reliability of knowledge. On view of Maxwell, there are five ways for judging the validity of qualitative research.

1. **Descriptive validity**
   Descriptive validity is the accuracy of the data. It is near to the concept of credibility. Further Maxwell says that, the reporting as well as the method of reporting data must reflect the participant and her communication. The thick description needs to echo the research participant and may also include other

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voices in the same social space. For example in the research on women's corporators, the functioning of the house has to get described from the perspective of that particular corporator. At the same time, it may include voices of other women / men corporators in the background.

2. **Interpretive validity**
   Interpretive validity refers to how perfectly, the researcher reports the participants peculiar meaning of events, objects and behaviour. The interpretations should not be based on the researcher's perspective but it must be rooted in the participants perspective. Justifiability is the word which echoes, interpretive validity. For example How students feel when they migrate to different countries, has to be described by selecting a perspective like emotional / social/ political et al and need express participants communication.

3. **Theoretical validity**
   Theoretical validity mainly transcends the description and the interpretation. Rather interpretation culminates into certain theoretical constructs. Theoretical constructions refer to the value of coherence in the data. For example A research on wash room availability for women in public domain may ultimately get constructed into social theory of feminism or into 'Right to Pee' Action.

4. **Generalisability**
   Generalisability basically refers to inductive process. It refers to the ability of a particular theory to get applied to other phenomena or to get applied universally. How far a particular theory is applicable to similar phenomena decides the validity of the theory and analysis. Theory is generally constructed through the development of meaning repetitive meaning patterns and themes. For example, some research of washrooms being conducted into various cities

5. **Evaluative validity**
   Evaluative validity mainly refers to transparency of the data. Transparency decides how far the analysis fulfils the condition of dependability and replicability. It is in continuations of generlisability.

**DISCUSSION**

In the quantitative paradigm of the research, validity and reliability are regarded as the touch stones of the research. In qualitative paradigm as well both the concepts become extremely important, however unlike quantitative paradigm it is not to construct statistical reliability and validity in the qualitative paradigm. Hence rethinking about these two touch stones of research becomes equally urgent and important in qualitative paradigm as well. Different thinkers have tried to interpret these two concepts in the context of qualitative research as well.

The concept of validity is reformulated in qualitative research today. Mishler, states that the process of validating knowledge is more important than validaity as state of knowledge. In other words, he emphasises, the trustworthiness of the data collection and data analysis. He focuses on the honesty and the transparency involved by the researcher at all the three stages of research, namely,

- Observation
- Interpretation
- Generalization

To quote, 'reformulating validation a the social discourse through which trustworthiness is established' Similarly, reliability is also being interpreted by various thinkers like Kirk and Miller. They discuss diachronic reliability in terms of the stability of measurements of observations in their temporal course. Or else, the constancy or consistency of the result obtained at the same time, but by using different research tools. In this case as well, what is more important, is trustworthiness of the process and transparency.

Sometimes it is believed that qualitative research is a soft or an easy option than quantitative research. It is also presumed that qualitative research is less rigorous and can rightfully be less rigorous than quantitative research. However, these misunderstandings about qualitative research needs to be wiped out through rigorous, transparent and constantly validating research. In fact, it is much more difficult to achieve validity and reliability in the qualitative paradigm. Moreover, the connotation of reliability and validity also needs to be flexible and dynamic to satisfy the needs of different qualitative methods like Narrative and Filing and so on. In fact, for films and visuals analysis, it is very important to consider the factors like philosophy of the lenses or philosophy of the camera.

We may conclude with Oscar Wilde's quotation,

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"Knowledge would be fatal, it is the uncertainty that charms one. A mist makes things beautiful." However attractive is the statement of the genius, in research field we have to look for rigour, trustworthiness, and transparency.

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# A PREMILINARY STUDY ON THE BIODIVERSITY OF MOLLUSCS OF THE UNEXPLORED AND UNTOUCHED BHUIGAON BEACH OF PALGHAR DISTRICT, MAHARASHTRA

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## ABSTRACT
*Aim of the present study is to assess the species diversity of molluscs at 'Untouched Bhuigaon Beach' located in the Palghar district of Maharashtra. The samples were collected to study the species diversity present at the beach. About 35 different species were observed, thereby showing the richness of molluscs at this beach. Bivalves & Gastropods belonging were identified. The commonly found species were Turbo, Trochus, Dentalium, Donax, Natica, Nerita.*

*Keywords: Bivalvia, Gastropoda, Donax, Natica, Molluscan diversity, Palghar.*

## INTRODUCTION
Phylum Mollusca is the second most diverse of all animal phyla next to Arthropoda. These commonly called shelled fish show high degree of adaptation thereby successfully occupying terrestrial as well as aquatic habitat. Not only they are important to humans as a cheap source of food primarily for coastal population, but also economically to make jewellery, tools, decorative articles, dyes, lime, cement and so on. Besides they are also used in medicine to help patients of heart disease & strokes and in pain control. The shells of oyster are also used as calcium supplements for human and well as animals. In India, till today, 5070 species of molluscs have been recorded of which, 3370 species are from marine habitats [2]. 8 species of oysters, 2 species of mussels, 17 species of clams, 6 species of pearl oysters, 4 species of giant clams, 1 species of window pane oyster and other gastropods such as Sacred chank, Trochus, Turbo as well as 15 species of cephalopods are exploited from the Indian marine region [3]. . Bivalvia which includes clams, mussels, oysters, scallops, is the second largest group of the phylum Mollusca, consists of approximately 15,000 different species. Gastropoda which includes snails, slugs, limpets are largest group of phylum Mollusca, consisting of more than 62,000 living species. They encompass about 80% of living molluscs. More importantly these molluscs specifically the bivalves, being filter feeders are used as bio-monitors, indicating the health of both freshwater and marine environment. Not much data is available on the species diversity of molluscs on this sandy beach of Bhuigaon. Hence, the present study is undertaken for investigating the present status of the molluscan diversity present in the study area.

## STUDY AREA
Bhuigaon beach known as the 'Untouched beach' is located in the vicinity of a village named Bhuigaon in the interiors of Vasai Suburb on the West Coast of Maharashtra with the co-ordinates 19.3907º N, 72.7620º E. The beach is currently attracting visitors in large number. Its intertidal zone has incredible molluscan diversity. Till now not much assessment of molluscan diversity has been done here. Hence, this area has been chosen to study the diversity of molluscans from rocky, sandy shore and intertidal zone.

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**LOCATION OF BHUIGAON BEACH**

Beach at Bhuigaon

**MATERIALS AND METHOD**

The molluscans were collected by hand picking by using gloves during low tide from the intertidal zone. Zip lock bags were used to bring the collected shells back to laboratory. To remove sand and mud, the shells were washed thoroughly with water taking care not to damage or alter the colour of the shells. This was followed by drying of these shells. Once dried, the shells were separated based on external morphology and similar ones were kept in separate plastic bags. The shells were then preserved in 5% formalin solution for further identification and their study.

With reference to keys available for identification, the collected molluscan specimens were identified, observing the morphological and special characters such as the shell morphology, hinge, interlocking dentition, shape, size and length with reference to standard literature available.

**RESULTS AND DISCUSSION**

The present study was aimed to assess the biodiversity of molluscan fauna at the unexplored and virgin Bhuigaon beach in Palghar district of Maharashtra. The species identified come under two main classes: Bivalvia and Gastropoda. Total 19 species of Bivalves and 16 species of Gastropods were collected and identified from different parts of the beach.

So the study provides information on the molluscan diversity of this beach which was unexplored and will help the further researchers to study better the abundant biodiversity of molluscs at this beach. Thus it was necessary to document the biodiversity of molluscs at preliminary level.

**The following species were collected and identified**

**DIVERSITY OF GASTROPODS**


**DIVERSITY OF BIVALVES**

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| SR. NO. | SPECIES |
|---|---|
| 1 | Turitella duplicate |
| 2 | Murex ternispina |
| 3 | Babylonia spirata |
| 4 | Conus figulinus |
| 5 | Oliva caerulea |
| 6 | Cerithium scabridum |
| 7 | Nerita oryzarum |
| 8 | Cypraea tigris |
| 9 | Umbonium vesitarium |
| 10 | Netica picta |
| 11 | Bursa granularis |
| 12 | Telescopium telescopium |
| 13 | Turbo brunneus |
| 14 | Trochus niloticus |
| 15 | Strombus labiatus |
| 16 | Stomatia phymatis |
| | |
| | |
| | |

**List of Gastropods Recorded During Study**

| SR. NO. | SPECIES |
|---|---|
| 1 | Donax scortium |
| 2 | Donax variabilis |
| 3 | Katelysia katelysia |
| 4 | Donax incarnates |
| 5 | Patella cerulean |
| 6 | Meretrix meretrix |
| 7 | Cardium fisvum |
| 8 | Diadora gracea |
| 9 | Arca granosa |
| 10 | Angulus lechriogramma |
| 11 | Chirocoreus brunneus |
| 12 | Paphia sps. |
| 13 | Purple tagelus |
| 14 | Dentalium elph |
| 15 | Crassostrea medrasensis |
| 16 | Fissurella |
| 17 | Placuna placenta |
| 18 | Nucula layardi |
| 19 | Cadulus jeffreysi |

**List of Bivalves Recorded During Study**

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13. Worldwide Mollusc Species Data Base http://www.bagniliggia.it/WMSD/SearchSpecies.php?freeText= Angulus++sinuata&inputFamily=&inputGenus=&inputSpecies= &input Variety=&input Author=&B1= Search

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# A PRELIMINARY CHECKLIST OF MARINE ALGAE OF BHUIGAON BEACH, PALGHAR DISTRICT, MAHARASHTRA

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## ABSTRACT
*Present study is aimed to check biodiversity of marine algae at 'Untouched virgin Bhuigaon beach' situated in Palghar district of Maharashtra state. Samples were collected during low tide, processed and preserved, herbarium specimens were prepared for identification of marine algae collected from the study site. A total of 11 species of marine algae were identified belonging to three different groups Chlorophyta, Phaeophyta and Rhodophyta. Species from later two groups were found to be dominating on the Bhuigaon beach in this preliminary study.*

## INTRODUCTION
India is a tropical country a large coastline of 7516.6 Km from Kutch to cape comorin and Sunderbans including Indian islands with a diverse coastline with respect to its geology and morphology. (Reddy C R K ,2014). The konkan plain of the Indian coastline extends from Daman from south of Gujarat plain to Goa and exhibits diverse form of marine biota throughout. Marine environment includes two chief types of plants viz. marine macroalgae and seagrass. Marine macroalgae which are commonly referred as seaweeds are the most beautiful groups of photosynthetic organisms growing under seawater. These belong to three major groups namely Chlorophyta (Green algae), Phaeophyta (Brown algae) and Rhodophyta ( Red algae). Marine algae can be identified and grouped under these three groups on the basis of their pigmentation or colour. Marine algae are known to be a good source of organic carbon in marine water which is present in the form of carbohydrate, nitrogenous and polyphenol materials. They also make a great source of compounds like carotenoids( lipid soluble isoprenoid compounds), dietary fibres, proteins, essential fatty acids, vitamins and minerals and are important sources of medicines and fertilizers.(Kasamala et al., 2015) (Chapman, 1998). They are good sources of minerals like potash and iodine which are extracted for commercial purpose. These photosynthetic organisms are used for the consumptions as compared to vegetables because of high content of essential fatty acids and also are good source of vitamin A, vitamin B-12, vitamin C, vitamin D, vitamin E, proteins and lipids. Since a long time seaweeds are also been staple food in Japan and China( eg. Laminaria,Porphyra) (Khan Sajid I and Satam S.B, 2003). Nutrient content of seaweeds vary with species, geographical location, season, humidity and temperature.(Kaehler S. & Kennish R.,1996). These make the groups of primary producers playing important role in entire ocean ecosystem and are found in different forms like unicellular, colonial, filamentous, heterotrichous (Thallus differentiated into prostrate portion and an upright system) and parenchymatous tissue. These are the marine plants which vary with respect to size from microscopic cell to a huge plant more than 700 feet as in the case of Laminaria and Macrocystis.( Hoyt, 1970). Many species of seaweeds are collected, identified and recorded found throughout the oceans of the world, out of these total recorded species of marine algae some 221 species are utilized commercially of which again 145 species are used for food and 110 species for production of phycocolloid (eg. agar). The oceans cover about 70% of earth surface and marine algae are renewable living resources and primary producers which sustain the entire marine ecosystem. Like other parts of the world in India seaweeds are utilized commercially and industrially to produce byproducts like phycocolloids and alginates (Reddy et al.,2014).Marine algae are also known to have medicinal properties which help to fight against human infectious disease, cancer , osteoporosis etc. (Smit A J., 2004). Overall marine algae are distributed all over the oceans and hence are considered ecologically and biologically important which play a very important role in providing nursery habitat for many fishes and other marine organisms, thus protecting food source and sustaining marine environment. It is necessary to study the marine algae of the unexplored coastal regions. This study is done on preliminary basis thus helping in filling the void by collection, identification and documentation of marine algae of untouched Bhuigaon beach of Palghar district of Maharashtra.

## STUDY AREA
Bhuigaon beach is located in Palghar district of Maharashtra with the coordinates 19.3707° N, 72.7620°E. It is a untouched beach with less visitors and comparatively less pollution.This beach is known as the 'untouched beach' because it is located in the interiors of the suburb away from the hustle bustle. The average mean temperature is 26.6 °C (80 °F) and the average precipitation is 2,434 mm (95.83 in). Average *humidity* is 61-86%, making it a *humid climate* zone. The coastline is intended by sandy shore and rocky shore with pools.

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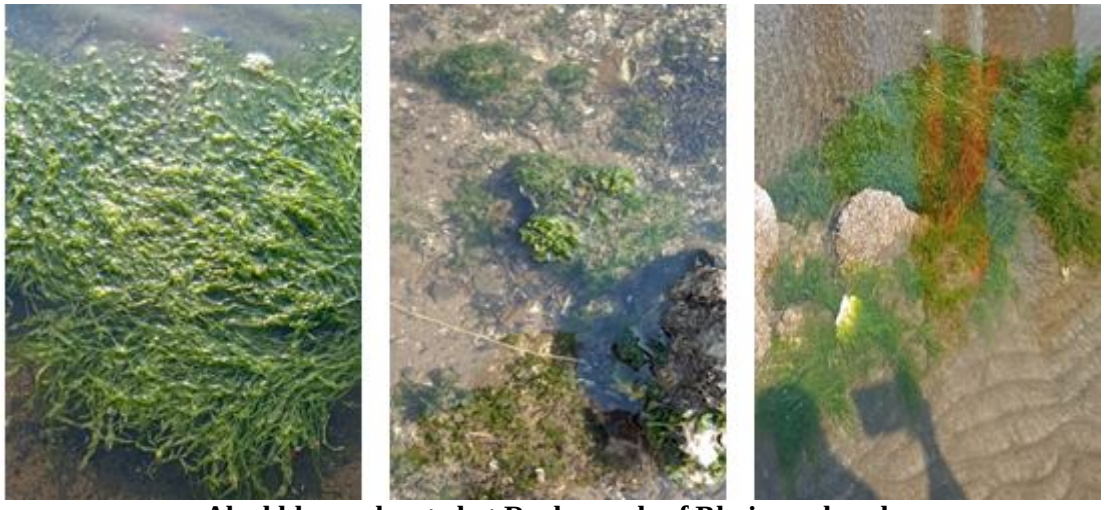
**Sampling Site – Bhuigaon beach, Nallasopara, Palghar, Maharashtra**

**Algal blooms located at Rocky pools of Bhuigaon beach**

## MATERIAL AND METHODS

For present investigation, collection of Macro marine algae was carried out with Bhuigaon coast of Palghar district, Maharashtra, during the low tides. Samples were collected during low tide from the rocky pools of the beach. The collected macro marine algae were washed in sea water and fresh water thoroughly to remove the epiphytes and other contamination. Then the washed algae samples were transferred into a sampling zip lock bag. Then these bags were labeled and brought to the laboratory. Collected species of macro marine algae were preserved in 4 % formalin solution for identification. Herbarium specimens were prepared for each species for identification and to confirm their taxonomic position. Identification of macro marine algal species was done with reference to standard literature *Common Seaweeds and Seagrasses of India Vol. I & II* published by CMFRI .

## RESULTS AND DISCUSSION

Present study was conducted to assess marine biodiversity with respect to marine algae of untouched & unexplored Bhuigaon beach of Palghar district of Maharashtra state. A total of 11 species of marine algae were collected from Bhuigaon beach. Recorded species belong to *Chlorophyta* (3 species.), *Rhodophyta* (4 species.), *Phaeophyta* (4 species.). The study provides information on the Algal diversity of this beach on preliminary basis which was unexplored.

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**Following marine algae species were recorded on collection from Bhuigaon beach.**

**Chart-1**

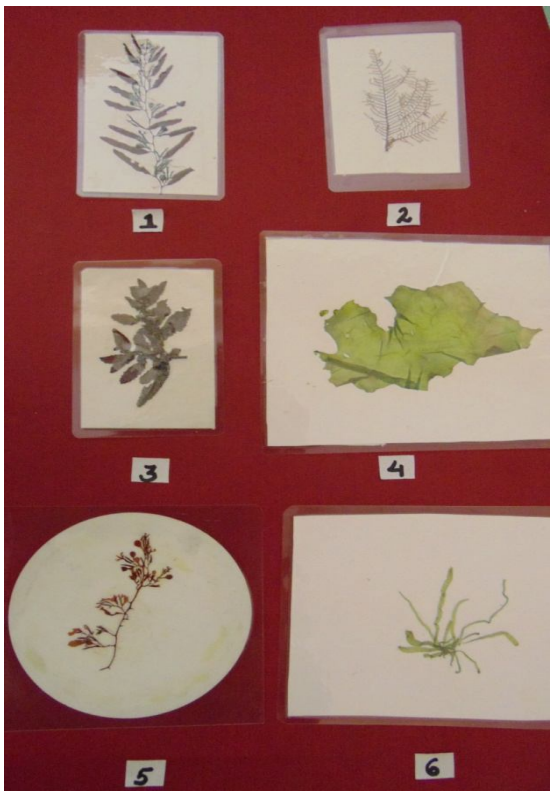


**Table-1**

| Sr, No. | Group | Species |
|---|---|---|
| 1 | Pheophyta | *Sargassum sp.* |
| 2 | Rhodophyta | *Grassilaria corticata* |
| 3 | Pheophyta | *Sragassum ilicifolium* |
| 4 | Chlorophyta | *Ulva lactuca* |
| 5 | Pheophyta | *Sargassum polycusfum* |
| 6 | Chlorophyta | *Enteromorpha clarata* |

**Chart-2**

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**Table-2**

| Sr, No. | Group | Species |
|---|---|---|
| 1 | Chlorophyta | *Endodermis verticilliata* |
| 2 | Rhodophyta | *Gelidium micropterum* |
| 3 | Rhodophyta | *Acanthophora specifera* |
| 4 | Rhodophyta | *Hypnea sp.* |
| 5 | Pheophyta | *Padina gymnospora* |

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