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Department of Philosophy, Andhra University, Visakhapatnam -530 003
Andhra Pradesh – India, Email: victorphilosophy@gmail.com

Editorial.....

I am very happy to learn that with the help and support of one and all the 3rd Issue of Volume - I has served its designated purpose. The close interaction of the intellectuals from the information of these articles serves as a powerful forum.

IJMER's aims and views continue to focus on the multidisciplinary aspects and the impact it makes should benefit scholars, academicians and executives with relevance to the contemporary era.

My personal thanks to the brilliant and respected persons who gave their valuable time for the reviews of the submitted papers.

I am particularly grateful to the Editorial Board for their suggestions and guidance. My heartfelt thanks once again to all the authors of the articles.

We will sustain the effort and in course of time IJMER will sufficiently attract the attention of a wider section. May the blessings of the Almighty be showered on all engaged in this genuine purpose? Knowledge dissemination is the intent and this is acknowledged by the enormous response IJMER received thus far.


(Dr. Victor Babu Koppula)



POST-COLONIAL NARRATIVE TECHNIQUE OF INDIAN WRITING IN - ENGLISH

V.Anand Kumar

S S & N College
Narasaraopet
Guntur, Andhra Pradesh

Midnight's Children is the story of Saleem Sinai, born on the midnight of 15th August 1947 the time and year of the birth of the modern nation. The narrative abounds in several instances of meaningful use of fantasy and symbolism. Thus Saleem who represents the new-born Indian nation is the son of an Englishman and an Indian woman. But what makes *Midnight's Children* an outstanding work is the fact that it has a distinctly existential dimension. One central theme seems to unify all the elements of political fantasy, comedy and surrealism in the novel.

If the political allegory in *Midnight's Children* concerns India, its sister nation, Pakistan, born at the same time is the subject of *Shame* (1983). Apart from allegory, the narrative has other dimensions as well. The miraculous birth of Omar and the sudden transformation of his wife into a white panther clearly belong to the fiction of magical realism. On the other hand *Shame* in a pejorative sense, is equated with dishonour, loss of self respect, humiliation etc. It is this pejorative sense that seems to be emphasized in this narrative of three decades of a country united in a "Macabre fellowship" of *Shame*.

Rushdie's *Haroun and the Sea of Stories* (1990) is perhaps his most delightful novel. He is supposed to have written the book at the request of his small son for a story, but here, as in the case of *Gulliver's Travels* is a children tale with an urgent message to the adults, a message on the issues of the liberty of creative imagination and the sanctity of the artist's freedom of expression. As an allegory *Haroun and the Sea of Stories* invites comparison with the earlier *Grimus*. And



the comparison immediately shows how much ground Rushdie has covered during the fifteen years that separate the two novels. In *Grimus*, the allegory was vague, confused and unanchored in a specific cultural reality. In *Haroun and the Sea of Stories* these fit as have been seriously avoided. Rushdie's another novel, *The Ground Beneath Her Feet*, (1999) stands apart from all his other attempts to deal with the theme of love.

The last decade of the twentieth century, more novels and collections of short stories have been published than ever before in the history of Indian writing in English. The events in the preceding decades had shaped the sense of disbelief, disillusionment and irreverence. The iconoclastic 80s and the 90s further sharpened it. The new generation Indian English novelists like Amitav Ghosh, Upamanyu Chatterjee, Vikram Seth, Shashi Tharoor, Rohinton Mistry, Firdaus Kanga, Farooq Dhondy, Vikram Chandra, Kiran Desai, Arundhati Roy, Anjana Appachana and Sunetra Gupta among others are concerned with the recent and not so distant events fictive and factual from the Indian past. They magnify the hiatus between the real world that they live in and the ideal world of their creative use of language in ironic, satirical, parody and fantastic mode. A group of Indian women novelists have contextualized the women problems in general and middle-class and upper-class women in particular.

The "new" women novelists have shared most of the preoccupations of their male counterparts. Twentieth century is remarkable for growing a host of women writers in India took up the cause of the woman who is searching for ways to assert her selfhood in a male prejudiced society. These writers are so courageous that they are ready to renounce the pattern of female expression that is set by age old patriarchal codes of behaviour. They broke the image of eternal suffering of Indian women, and pictured protagonists with courage to fight, to modify or to transform themselves. A delineation of inner life



and subtle interpersonal relationship is the major preoccupation in recent Indian women's writings. Concepts like individualism, quest for identity, protests and rebelliousness have often remained silent ideas in Indian culture and heritage as far as women were concerned. Their writing has expanded its social range and they also used new bold narrative techniques and subject. Above all, women writers have eloquently voiced women's side of life – the experiences of man's other. The contribution of women in post independent India especially in the past two decades has been unquestionably great and continuously increasing. Recently there has been an addition of Dalit literature, Subaltern literature and literature of feminism from the Indian women writers. These new voices are representations of marginalized sections of community and attract attention because of their profundity and veracity.

Thus Indian English novels have shown richness, diversity, and a capacity to accommodate a wide range of concerns. In the period of 1930s and 1940s '*Big Three*' have depicted realistic aspects and mythical imagination of Indian antiquity and sensibility. Bhabani Bhattacharya and Khushwant Singh have portrayed valuable insight into pathos and human degradation caused by political upheavals. The women writers as Kamala Markandaya and Anita Desai have focused on urban sensibility. Post-colonial novelists as Arun Joshi, Vikram Seth, Salman Rushdie, Rohinton Mistry, Kiran Nagarkar, Shobha De, Arundhati Roy, and Jhumpa Lahiri have all helped in recovering and enriching the creative and critical heritage of India. They have used new technique of combined reality and fantasy in the novels. They have used code mixing of language and flash back method in the novels.

The postmodern Indian English novels are written by Indian writers with freshness, glamour, humour, satire, and hybrid culture. After Independence Indian English literature got national identity through the Indian English writers. It gave them greater self-



confidence and widened their vision, and sharpened their knowledge. After Independence Indian English literature has grown fast both in India and abroad. After independence the Indian writers looked at the Indian scene from the post-colonial point of view. Post modern novelists didn't follow the form of the '*Big Three*.' Mulk Raj Anand, Raja Rao, R. K. Narayan, Nayantara Sahgal and Kamala Markandaya in the beginning wrote novels of social realism in the fifties. New novelists rejected old form and followed the new form and content and followed new techniques in rendering their stories in a new way.

The novelists of this period mainly depict metropolises, their inhabitants, their problems, plights, culture and their way of life. The reason for this is that "the nation itself has moved from the village centrism of the Gandhian era to the city centrism of the post-Nehru period" (Jon Mee 359). Some critics, however, believe that Indian writers in English have taken advantage of this trend to retreat into metropolitan or cosmopolitan elitism which produces literature intended only for the English-reading privileged classes within India or the international public outside.

The fiction of this period reflects the cultural translations, cultural dislocations, cultural crises and cultural degeneration. Hybridity, heterogeneity and pluralism prevail everywhere. Some of the major narrative devices the writers of this period employ are non-linear plots, multiple narration, flash back and flash forward, anti-heroes and heroines, more about common men, magic realism, intertextuality, mixed genres, story within story, chutnification and so on. These novelists have widely traveled, acquainted with many western theories and got exposed to the consequences of modernism with more emphasis on science and reason. In order to show their displeasure and to write back resorted to "magic realism", the style of combining ordinary events with dream like events. These writers resorted to magic realism to tell their own stories to the world, to decentre the centre, to bring



the peripheries to the centre and to reject the concepts of unity of time, place and action. In order to achieve this task they resorted to Indian traditions, beliefs, legends, mythologies and folklore. Thus, this Indian mine is being unearthed, familiarized to the west, written back and written home also.

The 'new' novel differs from the old in another aspect. It is in the sense that the new novel has become far more "globalised" in many senses. Anand (1905-2004), Narayan (1906-2001) and Raja Rao (1908-2006) have all lived in the West for a considerable time span, but their primary engagement has mostly been with India. But the new novelists go much ahead. Vikram Seth in his *The Golden Gate* (1986) selected all his characters that are American; and also in his *An Equal Music*, the characters are British and the scene European. Bhabani Bhattacharya in his *The Gabriel Club* of which setting is Hungary, took all the characters mid-European. The new novelists have been much fascinated by magic realism. The new novelists seem to have greater affinities with Marquez and Gunter Grass than with Narayan and Raja Rao. The young 'new' novelists of the 80s emerged as impressive arrays who are the contemporaries of Salman Rushdie. These novelists have also used the new born techniques. New novels now seem to have been westernized in terms of structure, style, technique and theme etc. it has been, too much so far away from the old heritage. The other practitioners of this new form are Amitav Ghosh, Shashi Tharoor, Vikram Seth, Upamanyu Chatterjee, and Allan Sealy etc. They are also called as *Rushdie's Children*.

Amitav Ghosh, Shashi Tharoor, Rohinton Mistry and Vikram Seth are well known novelists of this period. Amitav Ghosh's first novel, *The Circle of Reason* (1986) is a story of protagonist a Bengali orphan called "Alu" (Potato). He is called 'Alu' because his head is like potato, his real name is 'Nachiketa'. This name appears in Katha Upanishad who pursues the God of death importuning him to reveal



him the secret of existence. Alu is forced to run away from his village because he is falsely accused of being a terrorist. He is taken to the Middle East. Then he moves from al-Ghazira to Cairo, Egypt, the Sahara and finally to Algeria. The novel is full of interesting characters. His next novels, *In An Antique Land* (1992), *The Calcutta Chromosome* (1996) and *The Glass Palace* (2000) show him attempting different strategies. These novels are considered in their proper places later. His next novels are *The Hungry Tide* (2005) and *Sea of Poppies* (2008). Amitav Ghosh's *The Shadow Lines* (1989) won him the Sahitya Academy Award. *In An Antique Land* (1992) and *The Calcutta Chromosome* (1996) are different in theme, spirit and tone. His novel *The Glass Palace* (2000) traces the British occupation of Burma, the exile of Royal Family to India and their dwindling fortunes. It narrates the story of Rajkumar, the protagonist in a picaresque style. Most of his novels combine the areas of history and anthropology. His latest novels are *River Smoke* (2011) and *Flood of Fire* (2015)

Shashi Tharoor's first novel *The Great Indian Novel* (1989) is one of the finest examples of post-modern fiction in recent Indian English literature. He takes the title of the novel from the ancient Indian epic *The Mahabharata*. He portrays the chief characters and events in three thousand, year-old epic. *The Mahabharata* is the leading figure of political and developments in modern Indian history. He gives an ironic twist in a spirit of self-mockery. The venerable Bhishma becomes Gangadutta, a figure like Mahatma Gandhi. Priya Durodhani stands for Indira Gandhi who did the evil of splitting the congress party and the gagging of democracy during the infamous emergency. He uses in the novel, the technique of running a continuous parallel between antiquity and modernity. It parodies Vyasa's *Mahabharata* to analyse India under Mrs. Indira Gandhi rule. The novelist has shown the correspondence between the characters in *Mahabharata* and political figures and events in modern India. Shashi Tharoor himself spoke



about it, "to retell political history of 20th century India through a fictional recasting of events episodes and the characters from the Mahabharata" (Shashi Tharoor 5) In this novel, there is a fusion of myth and history. Tharoor dislikes communalism of any sort. He wants India's pluralism and diversity to be sustained. He admires novelty in novel. He frankly admits: 'I write about India because I care about India. I've not wanted to write about other places in the same way. At the same time... anchored to this place and to the preoccupations of Indians.' (Shashi Tharoor, *The Hindu*, Aug. 19, 2001).

Rohinton Mistry, (1952) lives in Canada, and has written novels in which Parsi characters play a major role. His novels are *Such a Long Journey* (1991) and *A Fine Balance* (1995). The "long" means hard and journey means the life of middle-aged, middle class Parsi bank clerk. Bank clerk lives in a Parsi tenement in Bombay. *A Fine Balance* is a much longer novel. It is hope and despair. The major characters take experiences and ultimately one of them commits suicide. Rohinton Mistry in his *Such A Long Journey* (1991) and *A Fine Balance* (1995) presents authentic studies of middle class Parsi life in Bombay. In his *Such a Long Journey* (1992) he deals with the predicament of modern individual. The protagonist, like a classical tragic hero, passes from happiness to misery. The novelist throws a light on social and political evil of India and ridicules the corruption in India. This is the story presenting the life of middle aged Parsi, that is full of hardships. The protagonist is a bank clerk, who unwittingly becomes the partner of his friend involved in bank fraud, though fortunately escapes. His friend mysteriously dies in prison. This novel is based on the famous case called "Nagarwala Case" during the rule of Mrs. Indira Gandhi. His *A Fine Balance* deals with the state of Emergency imposed by the Prime Minister, Mrs. Indira Gandhi. It presents a "fine balance" between hope and despair in the lives of the major characters. It presents how innocent people were deprived of their fundamental rights and



freedom. It focuses on the apathy of the innocent Indians during two years of Emergency period. His next novels are *Family Matters* (2002) and *The Scream* (2006). He was awarded the Neustadt International Prize for Literature in 2012.

Vikram Seth is a pioneer of the school of social realism. He has written a book of poems, *Mapping*, a travelogue, *From Heaven Lake*, three novels and a biography. Being inspired by Alexander Ruskin's *Eugene Onegin* (1831), a novel in verse, he produced his *The Golden Gate* (1986) a novel in verse. He has stunned the literary world by his voluminous novel *A Suitable Boy* (1993). This novel won much royalty and popularity to Vikram Seth. In this novel he has presented the history of a country through narrative. His novel, *A Suitable Boy* (1993) is a contrast to the *Midnight's Children*. The novel deals with war, peace, and middle march of India. Its title suggests the central action of the novel which is concerned with the search of middle aged lady. Mrs. Rupa Mehra finds a suitable bridegroom for her daughter. Her search becomes successful and Lata finds Haresh Khanna a young tanning expert quite suitable bridegroom. He depicts the social reality of the decade after independence. His second novel *An Equal Music* (1999) is a bold experiment. This novel's setting is entirely in the west and all the characters are European. It is a story of lovers, who are obviously considered "more equal" than others. Michael Holme is a young music student in London, and Julia, a fellow student whom he meets in Vienna where they both study music. A misunderstanding separates them. When he meets her ten years later in London, she appears as a married woman and mother of a boy.

Upamanyu Chatterjee is one of the most important realistic novelists. His novel *English, August, An Indian Story* (1988) is about young Agastya sen is known as "English August." His other novel is *The Last Burden* (1993). His next novel *The Mammaries of the Welfare State* (2000) is a sequel to *English August*. His other novel *Weight Loss*



(2006) is a dark comedy. His latest novel is *Way to Go* (2011). Upamanyu Chatterjee's *English, August: An Indian Story* (1988) is thinly autobiography of a sensitive administrative officer, August, who is posted to a small town where he finds life full of ennui, his colleagues dull, his work mechanical. August has to face monotony, creakiness. He suffers from the sense of isolation, physical mental and cultural dislocation, listlessness, meaninglessness and rootlessness of life and to get relief in such pathetic life and the stifling situation he takes support of drugs, drinking and masturbation. This novel has uncommon amalgam in expression through a mixture of wit, sharp expression and refreshingly foul language, a fundamentally anarchic iconoclasm but satirical tone.

In his *The Mammaries of the Welfare State* (2000), August has been portrayed as an unheroic hero without charm; without development after years of experience. The novel brought its author the 2004 Sahitya Akademi Award for English, by the Sahitya Akademi, India's National Academy of Letters. This novel also focuses on the Blunderland of Babudom, and its absurdities, bureaucratic red tape, corruption, nepotism, sheer pigheadedness etc. which have led the administrative system hopeless and futile. His *Weight Loss* (2005) presents story of Bhola, Protagonist and his lustful adventures with Subaltern of both sexes. Bhola is an embodiment of rootlessness, immorality, misanthropy, restlessness who seems to be sandwiched between confusion and self-hatred. He seems to be standing at the centre between indulgence and denial, conscience and materiality reasons and passions, rationality and irrationality. It reminds the readers of an ancient fable about a man who was caught between an urgent animality and distant sublimity and who could never enlighten himself how to be human being.

Communal disharmony has always diverted Indian English novelists to focus on the root causes of the communal riots and their



unwanted consequences. The worst communal riots in seventies and eighties and recent Gujarat massacre show that Gandhian principles of love and non-violence do not seem to be effective in bridging gap between two communities i.e. Hindu and Muslim. Nayantara Sahgal's *Mistaken Identity* (1988) realises the futility of Gandhian principles and believes that only a Hindu-Muslim marriage can bring the communal harmony back.

In Boman Desai's *The Memory of Elephants* (1988), is considered as a novel of Magical Realism for which the technique of going back to the past is used. In this novel Homi Seervai, the young Parsi scientist in U.S.A. invents a machine that can activate human brain. By means of that machine the scientist becomes capable to relieve the past, not only of his family, but that of his entire race. It is an encapsulation of "History of Parsi Community" with their origin, religion, life, culture and character. The fantasy in the novel is perfectly credible, given the first premise, and is put to significant use, viz. an encapsulation of Parsi history life, culture and character. The Magic Realism technique may give the novelist the widest possible scope for the exercise of imagination, but in that process, he always stands in danger of losing his hold on the structural values of fiction.

Belonging to much the same club as *Midnight's Children* and *The Great Indian Novel* is another novel. Allan Sealy (1951), wrote *The Trotter-Nama: A Chronicle* (1988). This novel is about Anglo-Indian. It was fainted by the controversy generated by Salman Rushdie's *Satanic Verses*. Allan Sealy's *The Trotter-Nama*, which is dedicated to the other post modern Tharoor's novel, this one gives a family tree, but Sealy's tree is more cleverly conceived and moves a step further towards a kind of verisimilitude by providing maps. Categories like 'Legend', 'Chivalry', 'Romance', 'Prose history', 'Decadence', 'Diaspora' and 'New Promise', distinguish the different generations of Trotters. Needless to say, the narrator belongs to the last of these. It (*Trotter-*



Nama: A Chronicle) is the story of seven generations of the Trotters, the descendents of a French mercenary, who settled near Lucknow in the 18th century. Finally it ends with most of trotters who are migrating to England and Australia, after India got independence from British rule. This title suggests a family chronicle history, legend, digressions, and humour of various kinds. Hence Sealy has used the technique of narrative like mock heroic and parody. Sealy's *Hero* (1990) deals with the political progress of a South Indian film-star towards his Prime-ministership. The theme of the novel is a departure from Anglo-Indian theme.

Farrukh Dhondy (b-1944) in his novel *Bombay Duck* (1990) has dealt with the contemporary issues such as communal fundamentalism which objects to the multinational caste of *The Ramayana*. He has focused on the picture of Bombay as a microcosm of India, and presented a deep insight into England what it is likely today in context of coloured immigrants particularly. The novel illustrates life realistically and interprets it intellectually. He succeeds in turning the traditional and conventional issues into matters of real intellectual concerns which normally do not affect man because he is ever prepared to submit to them unthoughtfully even though he is pricked and belittled at times by them. The novelist seems to believe that only such strides about thought can stimulate a cultural rethinking and perhaps a positive change or regeneration.

The writer chosen for the study Vikram Chandra belongs to the middle of the 90's, who established himself as a prominent literary icon in the history of Indian English novelists.

Vikram Chandra's novel *Red Earth and Pouring Rain* (1995) is a long and ambitious novel. The actions moved in the novel from India to USA and vice-versa covers two centuries. The characters include historical personages and Hindu Gods. The narrative moves jerkily



with flash back and dash forward and there are surrealistic effects. With four substantial books behind him Vikram Chandra has risen to prominence in recent years as one of the most acclaimed and critically lauded of the new generation of English-medium or Indian English writers. In the characteristic spirit of that literary movements his career so far is the product of a life spent between India and the West. He was born in Delhi in 1961, into a family with a professional inclination to writing and the cinema. The family moved to Bombay in 1978. His mother, Kamna Chandra, is the writer of several Hindi films including *Prem Rog* and *1942: A love story*. She has also written plays for all India Radio and Doordarshan and his father is a business man.

Chandra completed most of his secondary education at Mayo College, a boarding school in Ajmer, Rajasthan. In 1984 he graduated from Pomona College (in Claremont, near Los Angeles) with a B.A in English, with a concentration in creative writing. He then attended the film school at Columbia University in New York. In the Columbia Library by chance, he happened upon the autobiography of Colonel James Sikander (Skinner), a legendary nineteenth century soldier, born of an Indian mother and a British father. This book was to become the inspiration for Vikram's novel, *Red Earth and pouring Rain*. He left film school halfway to begin work on the novels.

Chandra is one of the followers of Rushdie in the style of writing. As a writer, Chandra hooks his audience with two baits, first there is his powerful use of language. He carefully constructed sentences to express profound thoughts and complex emotions with startling clarity. Second, he possesses the story teller's art of keeping his audience guessing. As the tales turn and twist like mountain roads, the audience is never quite certain where they will end up.

Vikram Chandra's first novel *Red Earth and Pouring Rain* is the highly interesting and ambitious which may be called an amalgam



of historical epic and magical realism. The book was received with outstanding critical acclaim. It won the David Higham prize for fiction and the Common Wealth Writers prize for best first book. It has been translated into nine other languages. Chandra sees himself as a modern story teller in the age-old Indian tradition a latter-day exponent of a very ancient art whose canonic examples include the *Ramayana* and *The Mahabharata* and indeed the tales of *A Thousand and One Nights* many of which are believed to be of Indian origin the novel, *Red Earth and Pouring Rain*, offers the readers a Chinese box structure of stories within stories framed the non-naturalistic circumstances of the displaced poet, Sanjay, reincarnated as a talking and writing white monkey telling tales of nineteenth century India.

Similar to *Arabian Nights*, the novel includes a series of stories told every night, not by Scheherazade but a monkey with a typewriter, who is a reincarnation of Sanjay, an 18th century poet. The monkey has been shot by Abhay, a college student studying in the US but visiting his family in India. In order to remain to alive the monkey must entertain Abhay's family with tales of his colourful former lives. Ensuring the delivery of the stories is Hanuman, the monkey god, Yama, the god of death and Ganesha, the elephant-headed remover of obstacles. If the stories are not completed to the satisfaction of the listeners, the monkey will be required to come back as a human once again. The lesson of karma dharma is predominating themes.

The focus upon themes relating to culture, race and language, in *Red Earth and Pouring Rain*, has led some commentators to examine the novel as an example of postcolonial fiction. Whilst engaging in his fiction with issues and themes of interest in the critical fields of post colonialism and post modernism, however, Chandra is also careful to distance him from these theoretical positions since he believes that they too, despite their anti categorical stance, have a tendency to become delimiting categories. He believes his fiction could be considered post-



modern, because of its self-conscious use of genre, because of the element of 'Kitsch' that creeps into some of the narratives, and because of its use of multiple narrators to tell stories within stories.

Vikram Chandra's literary work, *Love and Longing in Bombay* (1997) is a collection of five interlinked short stories. It secured him an award this time The Common Wealth Writers Prizes for the Best Book, Eurasia region. One of the stories "Dharma" was awarded the Discovery Prize by the Paris Review. Welcome's to the Season dock in Bombay where Mr. Subramaniam spins his tales for a select audience. There is the setting for a Vikram Chandra's collections and the stories which resonate long after the book is back on the shelf Chandra's prose is luminous, his tales satisfying Scheherazade would be impressed.

The novel is more accessible as it speaks from the perspective of the Indian context about universal commonalities. In the world in which international readers find themselves is architectural foreign and as some unfamiliar accessories they will soon regain themselves in the lives which unfold. *Love and Longing in Bombay*, (1997) is a series of five stories bound together by the frame narrative, in which Subramaniam tells the stories to the audience at the Fisherman's Rest, a bar just off Sasoon Dock in Bombay. Each of the stories told by Subramaniam, and relayed by Ranjit Sharma, represent an engagement with a different genre; although, as Chandra has made clear, his intention was to investigate and interrogate, rather than duplicate, traditional forms.

The result of this the self-conscious examination of genre is a ghost story in which the ambivalent and slightly disorienting ending does not provide us with a ghost, but with a psychoanalytically inspired interpretation of what ghosts might symbolize; a tale of Machiavellian intrigue that is conducted between women in private and domestic spaces; a nourish thriller in which the hero does not solve the crime,



but in a mode similar to other contemporary writers of detective fiction, is left with fragments that cannot be drawn into a whole; and two complex tales of homosexual and heterosexual love in which desire is bound up with a sense of loss, loneliness, and longing.

Vikram Chandra's second novel and third literary work is a novel *Sacred Games* (2006) a crime novel, a detective story, and a suspense thriller. Vikram Chandra's novel draws deep into the life of Inspector Sartaj Singh – and into the criminal underworld of Ganesh Gaitonde, the most wanted gangster in India. Sartaj Singh, a seasoned and cynical Bombay police officer, is summoned by an anonymous tip one morning, by a voice which promises him an opportunity to capture the powerful Ganesh Gaitonde, criminal overlord of the G-Company. The confrontation between Sartaj and Ganesh lies at the heart of this epic novel. In this novel, Chandra has built his multistoried novel inhabited by dons and cops, starlets and pimps, politicians and assassins, undercover operators and mysterious godmen, not with raw material collected from the junkyard of history. *Sacred Games* concerns itself with all the big themes: crime, wealth, friendship, honesty, and the way we live and love. Most of all, perhaps, it is a novel about Mumbai. It is portrayed as a city of infinite possibilities, capable of magically transforming the lives of some of those who come here for a living.

Vikram Chandra's latest literary work is a non-fiction work about the culture of computer programming and classical Indian aesthetics was published in 2013 by Penguin India as *Mirrored Mind: My Life in Letters and Code*; and in 2014 by Faber & Faber as *Geek Sublime: Writing Fiction, Coding Software*. The book was published in the US as *Geek Sublime: The Code of Beauty, the Beauty of Code* by Graywolf Press in September 2014. Vikram Chandra has been a computer programmer for almost as long as he has been a novelist. In this extraordinary book he returns to his early days as a writer, when



he was beginning *Red Earth and Pouring Rain*, and looks at the connections between these two worlds of art and technology.

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VOILATION OF HUMAN RIGHTS IN ALEX LA GUMA'S LEMON ORCHAD

T.David Paul Babu

Head
Department of English
K.V.R. College
Nandigama

Alex La Guma's *The Lemon Orchard* deals with the events that actually occurred in South Africa during racial violence when members of the oppressed groups finally refused to accept the injustices of the apartheid system. The story gives an excellent demonstration of how La Guma portrays the violation of human right in South Africa's apartheid rule. La Guma describes in chilling detail how a coloured teacher is roused from his sleep and led to the lemon orchard by five white men for whipping.

At the beginning of the story, the moon is hidden behind long, high parallels of the cloud. As if it does not wish to witness what is about to happen. It hides behind clouds and shows its disapproval by refusing to cast its light on the men. The coloured school teacher ignores the common belief that the white are superior to other races. He attacks a white man, who is the principal and a Church Minister. The whites are convinced of their superiority over coloureds and other races. They are determined to do all they could to ensure that apartheid's authority is not challenged. They feel that the teacher's attack of the white principal is an insult to the whole race and decided to teach him a lesson.

The white men tied the coloured man's wrists with a riem and wounded him around the ridges of his chin. This was the violation of human right He was afraid.



In the eyes of this white man, all should enjoy the immunity that they had from the apartheid regime. The white treat all the non-whites simply as untouchables. The racist contempt of the white men for the educated coloured man is well conveyed. One of the whites says: 'I will shoot whatever hotnot or kaffir I desire, and see me get into trouble over it' (134). These words of the white man clearly show the notion of injustice. Shooting any one for no reason is itself an injustice and insulting a man by calling him as 'hotnot' or 'kaffir' is another kind of violation of human rights. The fact is that the white man is sure that after shooting, there would be no legal proceedings. This is an indication of the society which is placed beyond all laws and human rights.

The white men use violence as a way of punishing the coloured man. By using it, they force him to respect white supremacy and never again attempt to challenge them. It clearly shows the brutality of the white. La Guma's motivation is to put into words the real situation of the human rights in the lives of the coloureds. At the same time, he expresses his feelings and creates sympathy

The story form a powerful indictment of the evils of the apartheid and violation of human right, particularly in relation to the coloured community of Cape Town. La Guma never forgets that his characters are human beings. He tries to represent the life's victims i.e., the insulted and injured, the forlorn and alienated.

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NANOMATERIAL

M.L. Hari Prasad

Lecturer in Physics
The Adoni Arts & Science College
Adoni

Abstract

Nanotechnology is the design, fabrication and application of nanostructures or nanomaterials and the fundamental understanding of the relationships between physical properties or phenomena and material dimensions. The density of states concentrates carriers in a certain energy range, which is likely to increase the gain for electro-optic signals. The quantum confinement of carriers converts the density of states to a set of discrete quantum levels. The finite size of the particle confines the spatial distribution of the electrons, leading to the quantised energy levels due to size effect..

1. Introduction

Nanomaterials are the particles (crystalline or amorphous) of organic or inorganic materials having sizes in the range of 1-100 nm. Nanomaterials are classified into nanostructured materials and nanophase/nanoparticle materials. The former refer to condensed bulk materials that are made of grains with grain sizes in the nanometer size range while the latter are usually the dispersive nanoparticles. To distinguish nanomaterials from bulk, it is vitally important to demonstrate the unique properties of nanomaterials and their prospective impacts in science and technology.

Technology in the twenty first century requires the miniaturization of devices in to nanometer sizes while their ultimate performance is dramatically enhanced. This raises many issues regarding to new



materials for achieving specific functionality and selectivity. Nanotechnology is the design, fabrication and application of nanostructures or nanomaterials and the fundamental understanding of the relationships between physical properties or phenomena and material dimensions. It is a new field or a new scientific domain. Nanotechnology also promises the possibility of creating nanostructures of metastable phases with non-conventional properties including superconductivity and magnetism. Machines that will greatly impact the world we live in. Examples of possible miniaturization are computers with infinitely great power that compute algorithms to mimic human brains, biosensors that warn us at the early stage of the onset of disease and preferably at the molecular level and target specific drugs that automatically attack the diseased cells on site, nanorobots that can repair internal damage and remove chemical toxins in human bodies, nanoscaled electronics that constantly monitor our local environment.

Nanomaterials have properties that are significantly different and considerably improved relative to those of their coarser-grained counterparts. The property changes result from their small grain sizes, the large percentage of their atoms in large grain boundary environments and the interaction between the grains. Research on a variety of chemical, mechanical and physical properties is beginning to yield a glimmer of understanding of just how this interplay manifests itself in the properties of these new materials. In general, one can have nanoparticles of metals, semiconductors, dielectrics, magnetic materials, polymers or other organic compounds. Semiconductor heterostructures are usually referred to as one-dimensional artificially structured materials composed of layers of different phases/compositions. The semiconductor heterostructured material is the optimum candidate for fabricating electronic and photonic nanodevices. It is seen that properties of these particles are quite



sensitive to their sizes. This is partly connected with the fact that surface to volume ratio changes with a change in particle size. A high percentage of surface atoms introduce many size-dependent phenomena. High surface area is an important feature of nanosized and nanoporous materials. Many potential industrial applications, such as separation science and catalytic processing, because of the enhanced chemical reactivity for optical applications, a wide range of nanostructure-based optical sources that include high performance lasers to general illumination can be fabricated. These industrial requirements can be accomplished by selecting an appropriate fabrication method of functional nanostructures with controlled size, shape and composition. However, assembling nanoparticles to form a nanostructure is a complex process. Numerous research groups are working out different synthetic strategies to find economically affordable ways for fabricating the nanostructures and simultaneously preserving the superior characteristics of the basic building units (nanoparticles) in various devices.

1.1. Classification of nanomaterials

Depending on the dimension in which the size effect on the resultant property becomes apparent, the nanomaterials can be classified as zero dimensional (quantum dots) in which the movement of electrons is confined in all three dimensions, one-dimensional (quantum wires) in which the electrons can only move freely in the X-direction, two-dimensional (thin films) in which case the free electron can move in the X-Y plane, or three dimensional (nanostructured material built of nanoparticles as building blocks) in which the free electron can move in the X, Y and Z directions .

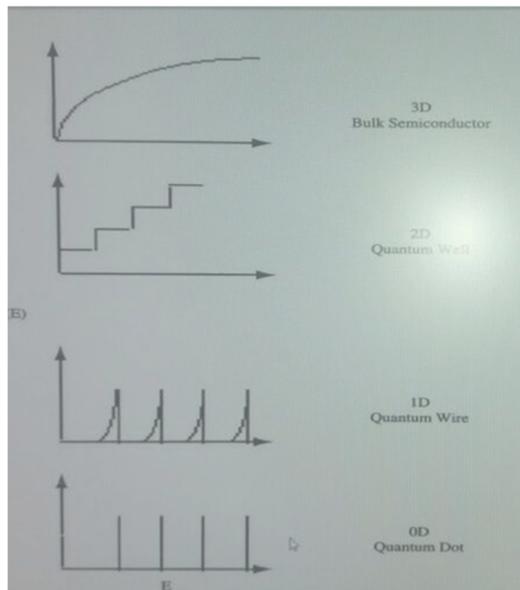


Figure 1.1 Variation of density of states with dimensionality

Semiconductor nanocrystals are zero-dimensional quantum dots, in which the spatial distributions of the excited electron-hole pairs are confined within a small volume, resulting in the enhanced non-linear optical properties. The density of states concentrates carriers in a certain energy range, which is likely to increase the gain for electro-optic signals. The quantum confinement of carriers converts the density of states to a set of discrete quantum levels. With consideration the small size of a semiconductor nanocrystal, its Chapter 1 5 electronic properties are significantly affected by the transport of the single electron, giving the possibility of producing single electron devices. The schematic diagram in figure1.1 illustrates the variation of density of states with dimensionality.

Passing from three dimensions to two dimensions the density $N(E)$ of states changes from a continuous dependence $N(E) \sim E^{1/2}$ to a step like dependence. The optical absorption edge for a quantum well is at a higher photon energy than for the bulk semiconductor and, above the



absorption edge, the spectrum is stepped rather than smooth the steps corresponding to allowed transitions between valence-band states and conduction-band states, while, at each step, sharp peaks appear corresponding to electron-hole (exciton) pair states.

In the case of zero dimensional systems, the density of states is illustrated as a delta function. The low-dimensional structure has proven to be very promising for application to semiconductor lasers, which is mainly due to the quantum confinement of the carriers and the variation of the density of states with dimensionality. The density of states has a more peaked structure with the decrease of the dimensionality. This leads to a reduction of threshold current density and a reduction of the temperature dependence of the threshold current.

Nanomaterials and related devices can be classified into three major categories, and suitable preparative methods are identified depending on the desired resultant structures. The first category of nanomaterials consists of isolated, substrate-supported or embedded nanoparticles, which can be synthesized by physical vapor deposition (PVD), chemical vapor deposition (CVD), inert gas condensation, aerosol processing, precipitation from supersaturated vapors, liquids, or solids etc. Low-dimensional semiconductor structures are usually fabricated by highly sophisticated growth techniques like molecular beam epitaxy (MBE) and metal organic chemical vapor deposition (MOCVD). Quantum dots can be grown in a relatively easy way via the chemical methods including the colloidal method, sol-gel method, self assembly, embedding in polymers, encapsulation in zeolites or in glasses and so forth. Many terms have been used to describe these ultra small particles, such as quantum dots, Q-particles, clusters, nanoparticles, nanocrystals and others. Usually the zero-dimensional structures prepared in physical methods like MBE and MOCVD are called quantum dots by physicists while the small particles formed in



chemical methods are called nanoparticles, nanoclusters, Q-particles or nanocrystallites by chemists.

The second category refers to materials having a thin nanometer-sized surface layer, which can be processed by techniques such as PVD, CVD, ion implantation, or laser ablation. The major advantage of these techniques is that the processing parameters can be suitably tuned to obtain a nanometer-sized surface layer. The self-organization and chemical self-assembly are also emerging as very important techniques for the deposition of materials layer-by-layer with controlled particle size and composition. Three dimensional (3D) materials having nanometer sized grains belong to the third category. The crucial aspect related to the processing of these materials is control of the chemical composition and the grain size. For example, the metastable 3D nanostructures such as glass, gels, supersaturated solid solutions, or implanted materials can be prepared by quenching the high temperature at equilibrium to the room temperature. The quenching helps to freeze the disordered structure with the composition varying on an atomic scale. Nanostructured-glass ceramics, which belong to the category of metastable 3D nanostructures, have been studied with immense interest in recent years because of the potential engineering applications. Another type of materials that belongs to this group is 3D ordered solid having building blocks as nanocrystals. The microstructures of such solids comprise crystals with varying orientations separated by interfaces, which may be coherent, semi coherent or incoherent. The ideal preparative route for such structures would involve the optimization of the processing conditions to ensure the formation of a microstructure with controlled grain growth so that all the unique properties of the nanobuilding blocks are preserved.



1.2. Types of nanomaterials

1.2.1. Fractals

Real fractals are self-similar structures that result from physical, chemical or biological growth processes. A colloidal suspension is a fluid containing small charged particles, monomers, which are kept afloat by Brownian motion and kept apart by coulomb repulsion. Changing the chemical composition of the solution can induce a change in the interaction and an aggregation process can be initiated. Lin et al. has indicated that the colloidal aggregation has universal features, which are independent of the nature of the colloidal systems. There are two limiting regimes for the colloidal aggregation. (1) A fast diffusion limited colloidal aggregation (DLCA) regime in which the reaction rate is determined solely by the time needed for the clusters to encounter each other by diffusion. (2) A slow reaction limited colloidal aggregation (RLCA) regime in which the cluster repulsion has to be overcome by thermal activation, a process that may require numerous encounters. The universal features have been demonstrated for colloidal aggregates of gold, silica and polystyrene.

1.2.2. Porous materials

Porous materials are characterized by a solid network having voids throughout the material and have been recognized as an important class of materials that can find applications in various fields. The percentage of porosity varies from ~ 5% to 25% in nanophase materials. The value is higher for consolidated oxide nanoparticles compared to the metal nanoparticles. The porosity enhances diffusion in nanophase ceramics. Doping of oxide nanomaterials with various types of dopants enables tuning of the properties to fit in a variety of applications. This has been a major area of research in recent years.

According to international union of pure and applied chemistry (IUPAC) porous materials are characterized by pore size categorized by



sorption behavior. They are microporous materials with pore sizes smaller than 2 nm, mesoporous materials with pores between 2 nm and 50 nm, and macroporous materials with pores larger than 50 nm.

Mesoporous materials can be synthesized by a wide range of techniques such as chemical etching, sol-gel processing and template assisted techniques. Ordered self assembly of hollow structures of silica, zeolites, carbon and Titania has drawn much attention recently because of their applications in low loss dielectrics, catalysis, filtering and photonics. The low density of the material results in very low dielectric constant, a candidate for low loss electronic devices. The synthesis of mesoporous materials can be useful for environmental cleaning and energy storage.

1.2.3. Zeolites

Zeolites are often referred to as molecular sieves because their physical shapes allow them to sift materials. In structure they look like nanoscopic galleries or chambers interconnected by nanoscopic tunnels or pores, all dug out of a solid oxide. There are hundreds of different zeolite structures. The special nanopore structure of zeolites is the secret of their catalytic capabilities, and they represent highly profitable applications of nanotechnology.

1.2.4. Fullerenes

Research in C₆₀ fullerene has sparked a great effort in carbon related nanomaterials. Fullerene and carbon nanotubes can be chemically functionalized and they can serve as the sites/cells for nanochemical reaction. Carbon nanotubes have been known since the ingenious discovery of Iijima in 1991. The long, smooth and uniform cylindrical structure of the nanotube is ideal for probe tips in scanning tunneling microscopy and atomic force microscopy. The ballistic quantum conductance of carbon nanotube was observed in defect free carbon nanotubes. This effect may have great impact on molecular electronics



in which carbon nanotubes could be used as interconnects for molecular devices with no heat dissipation, high mechanical strength and flexibility.

Self-organization and chemical self-assembly are promising techniques that provide inexpensive routes for the fabrication of nanostructures. In the immediate future, one can expect the miniaturization revolution in device fabrication to reach its peak in various industries. However, a recent study predicts that there is an optimum limit for miniaturization beyond which the second law of thermodynamics no longer holds.

1.2.5. Self assembly

Passivated nanocrystals superlattices Self-assembly passivated nanocrystals superlattices involve selforganization into monolayers, thin films, and superlattices of size selected nanoclusters encapsulated in protective compact organic coating. A key step in this process is the fabrication of size and shape controlled nanocrystal assemblies that have the potential to assemble into large superlattice crystals for technological applications.

Size and even shape-selected nanocrystals behave like a molecular matter and are ideal building blocks for two and three-dimensional cluster self-assembled superlattice structures. The electric, optical, transport and magnetic properties of the structures depend not only on the characteristics of individual nanocrystals, but also on the coupling and interaction among the nanocrystals arranged with long-range translational and even orientation order. Self-assembled arrays involve self-organization into monolayers, thin films and superlattices of size-selected nanocrystals.

1.2.6. Micelles

When the surfactant concentration exceeds the critical micelle concentration (cmc) in water, micelles are formed as aggregates of



surfactant molecules. In normal micelles the hydrophobic hydrocarbon chains of the surfactants are oriented toward the interior of the micelle, and hydrophilic groups of the surfactants are in contact with the surrounding aqueous medium. Above the cmc the physical state of the surfactant molecules changes dramatically, and an additional surfactant exists as aggregates or micelles. The bulk properties of the surfactant change around the cmc, such as osmotic pressure, turbidity, surface tension, conductivity and self-diffusion.

Reverse micelles are formed in the nonaqueous medium where the hydrophilic head-groups are directed toward the core of the micelles. In the case of reverse micelles there is no obvious cmc because the number of aggregates is usually small and they are not sensitive to the surfactant concentration. The general method of using reverse micelles to synthesize nanoparticles can be divided into two cases. The first case involves the mixing of two reverse micelles. Due to coalescence of the reverse micelles, exchange of the materials in the water droplets occurs, which causes a reaction between the cores and the nanoparticles are formed in the reversed micelles. The second case involves mixing one reactant that is solubilised in the reversed micelles with another reactant that is dissolved in water. Metal nanoparticles can be prepared by reducing metal salts in the reversed micelles. Reducing agents such as NaBH_4 , N_2H_4 and sometime hydrogen gas were used.

1.2.7. Self assembled monolayers

Self assembled monolayers (SAM) are a prototypical form of nanotechnology: the molecules that form the SAM carry the instructions required to generate an ordered, nanostructured material without external intervention. SAMs demonstrate that molecular-scale design, synthesis, and organization can generate macroscopic materials properties and functions. Although the details of the thermodynamics, kinetics and mechanisms of assembly will differ significantly, SAMs



establish a model for developing general strategies to fabricate nanostructured materials from individual nanometer-scale components (molecules, colloids, or other objects). SAMs are important components of many other forms of nanotechnology. Because SAMs can assemble onto surfaces of any geometry or size, they provide a general and highly flexible method to tailor the interfaces between nanometer scale structures and their environment with molecular precision. SAMs add chemical functionality and thermodynamic stability to the surfaces of relatively simple inorganic nanostructures (quantum dots, superparamagnetic particles, nanowires) and make it possible to connect them to more complex systems.

1.2.8. NC core/shell structures

Methods for overcoating a semiconductor nanocrystal (NC) with a second semiconductor material are well developed, and different kinds of core/shell structures have been successfully constructed including CdSe/ZnS, CdSe/ZnSe, CdSe/CdS, FePt/Fe₃O₄, CdTe/CdSe and CdSe/ZnTe core/shell nanoparticles. There are some requirements to prepare core/shell systems by epitaxy growth: (a) The existing NC seeds must withstand the conditions under which the second phase is deposited, (b) The surface energies of the two phases must be sufficiently similar so that the barrier for heterogeneous nucleation of the second phase is lower than that for homogeneous nucleation and (c) the seed NC and the overcoat material must not readily interdiffuse under the deposition conditions. Metal oxide nanoparticles (e.g. Fe₃O₄, TiO₂, MnO, BaTiO₃ etc.) can also be produced using this method.

1.2.9. Nature's nanoparticle factories

There are also different cellular organisms creating and using nanoparticles. One can find Fe₃O₄, Fe₃S₄, CdS, La (NO₃)₂, H₂UO₂PO₄, Ag, Te, Se, Au and Tc nanoparticles in natural systems. The most amazing example is the creation and use of magnetite



nanoparticles enabling the use of biomagnetism. The Fe₃O₄ crystals exhibit a magnetic moment and enable the organism to navigate within the magnetic field of earth. Magnetotactic bacteria live in anaerobic environments and the magnetic sensor enables them to swim downwards, away from the oxygen rich water-air surface.

1.3. Properties of nanomaterials

The size dependent catalytic properties of nanocrystals have been widely studied, while investigation on the shape (facet)-dependent catalytic behavior is cumbersome. It is seen that reactivity of nanoparticles increases with decrease in particle size, melting temperature of nanophases is considerably lower than their bulk counter parts and the color of a nanoparticle (especially semiconductors) changes with its size. At times a particle could behave as metallic or semi conducting depending on its size. The finite size of the particle confines the spatial distribution of the electrons, leading to the quantised energy levels due to size effect. This quantum confinement has application in semiconductors, optoelectronic and in non-linear optics.

1.3.1. Surface Plasmon resonance

Colloidal solutions of spherical gold nanoparticles exhibit a deep red color due to the well-known surface plasmon absorption. The surface plasmon resonance is caused by the coherent motion of the conduction band electrons, which interacts with an electromagnetic field.

The observed color originates from the strong absorption of the metal nanoparticles when the frequency of the electromagnetic field becomes resonant with the coherent electron motion. The frequency and width of the surface plasmon absorption depends on the size and shape of metal nanoparticles as well as on the dielectric constant of the metal itself and the surrounding medium. Noble metals such as copper, silver and gold, have a strong visible light plasmon resonance, whereas most



other transition metals show only a broad and poorly resolved absorption band in the ultraviolet region.

The various interesting properties exhibited by oxide nanoparticles are the consequences of the size reduction. The enhancement in electrical conductivity is predicted for nanosized conducting ceramics as a result of space charge contribution from the interfaces. Size effects play a crucial role in influencing the domain dependent magnetic and dielectric characteristics. Another interesting effect is size quantization in semiconducting nanoparticles. As the sizes of the semiconductor nanoparticles are reduced to dimensions

CONCLUSION

For decades metal-oxides have been extensively investigated by solid state chemists. Recently metal-oxide nanoparticles like, ferrites, vanadates, phosphates and tungstates have been the subject of much interest because of their unusual magnetic, catalytic, optical, and electronic properties. Most of these properties are due to particles of uniform size and shape distribution. However, to obtain metal oxides as nanoscale materials with well-defined size, shape and composition, traditional solid-state synthesis methods are unsuitable. Literature survey reveals that, ferromagnetic materials by the name ferrites have attracted the attention of chemists, physicists and technologists since they exhibit magnetic as well as semi-conducting properties and because of their broad applications in several technological fields including catalysis, permanent magnets, magnetic fluids, magnetic drug delivery, microwave devices and high-density information storage. For any particular application, the magnetic nanoparticles must possess specific properties. For example, data storage applications require particles with stable switchable magnetic states to represent bits of information, states not affected by temperature fluctuations. In bio-



medical applications, the nanoparticles must exhibit superparamagnetic behavior at room temperature.

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POST COLONIAL AND COSMOPOLITAN CULTURE OF VIKRAM CHANDRA'S LOVE AND LONGING IN BOMBAY

K.Mohana Rao
Lecturer in English
S.S & N College
Narasaraopet
Guntur, A.P.

Vikram Chandra's second novel, *Love and Longing in Bombay* (1997) is able to evoke something of the cultural complexity, the contradictions and vitality of life in post-colonial Asia. The book consists of a collection of five interlinked short stories. Each of the stories has been described as a tale from a well-established genre, i.e., "the ghost story", "the love story", or "the murder mystery". The stories use the devices of "the ghost story", "the romance", romantic love, post-colonial culture and the like. Each story explores the inner lives of the characters in question. It delves into their emotional experiences, their ambitions, passions and fears. The characters carry a kind of realistic weight to them. They are not simply symbols or archetypes but are constructed to communicate the author's ideas.

The characters themselves are nested within the rich cultural and social tapestry of modern, cosmopolitan Bombay. There is little or nothing of the "exotic" or the mythological in Chandra's portrayal of the city and its inhabitants. It is very much a set of stories told from the perspective of an inhabitant, familiar with the ways of the city. In that respect, *Love and Longing in Bombay* is quite unlike the writing of South Asian expatriates, such as V.S. Naipaul, or colonial writers such as E.M. Forster. The writing is not obsessed with notions of difference, nor does the writing focus on perceptions of "otherness". As observed by Yit Arun Teh: The stories convey a sense of authenticity of experience to the reader without a hint of the expatriate or neo-colonial



filters that so often appear in “books about India” (http://www.pentrace.net/review_103000002.html).

The novel is structured as a sequence of stories narrated in a city bar, the “Fisherman’s Rest” to an audience of regulars by a retired civil servant named Subramaniam. Since the book is subtitled “stories” linking them hardly seems necessary to appease the marketing forces that encourage writers to link their collections. In this book, a crucial keyword is “Listen” and indeed, the story telling motif is written into the fabric of Chandra’s text. The final story entitled “Shanti”, culminates in a creative act of story-telling that generates a marriage.

The five stories are linked by two characters; Shiva Subramaniam, who tells the stories and Ranjit Sharma, who reels them to the reader. The stories are entitled, ‘Dharma’, ‘Shakti’, ‘Kama’, ‘Artha’ and ‘Shanti’ all of them after Indian philosophical concepts. The first four are told by Subramaniam, in a city bar, to a group of regulars, one of them is Ranjit; the last, a more personal tale (of how Subramaniam meets his wife) he narrates in his own house, to Ranjit alone.

Set in modern Bombay, these five inter-connecting stories provide the frame of this immensely absorbing book. The narrator, Ranjit Sharma, a young software company employee, is drawn into the orbit of the wise, retired civil servant, Shiva Subramaniam, who serves as a kind of Scheherazade, telling stories that encompass many levels of human experience and subtly reveals the social and cultural levels of teeming Bombay. According to Hillery Johnson, Chandra’s novel marks a departure from the conventional mode of ancient Indian story telling. It portrays contemporary life in India’s most sophisticated city of Bombay. The five stories form as it were, an integrated whole and read like a full-length novel.



The first story, "Dharma", is about a fearless Major General, Jago Antia (real name Jehangir Antia). He has shown great deeds in the battlefield and seems to be without care in the world. But beneath this tough exterior lies a man who is haunted by a private grief and unable to confront it which eventually takes the shape of a ghost. Jago Antia returns home to Bombay after being crippled in the war. The narrator of the story, Subramaniam, begins the story with a whispering note. "I knew a man once who met a ghost;" he said. I still had my body turned around in the seat, but the rest of them turned to him expectantly. He said, "some people meet their ghosts, and some don't. But we are all haunted by them" (p. 3). Jago Antia, as the story unfolds, is haunted by the spirit of the small boy. It always disturbs the house. When Antia is about fifty, his missing leg gives him unbearable agony. He is a sincere punctual of discipline, famous for his sublime, for his tactical skill and his ability to read the ground. He has been awarded with gold medal at Kharak Vasla for his bravery.

He resigns his job and he reaches Bombay, his ancestral place. His house is situated in Khar. Amir Khan is the house keeper who is very old with a thin neck and a white beard. He is vexed with the disturbance of the spirit. "Sell it", Amir Khan said, "I am tired of it" (p. 11). Amir Khan persuades Jago Antia to sell the house urgently, but Todywalla to whom Jago Antia wants to sell it, cries foul. There is something in that house. "He found the staircase and went up, his thighs tense, moving in a fluid half-squat. Now he was truly watchful, because the voice was too young to be Amir Khan" (p. 12). Jago Antia dismisses it as nonsense and tells Thapa, his servant, a batman. Antia stands erect and he wants to sleep there all alone. "I will sleep tonight quietly and so will you. No more of this foolishness" (p. 16). Thapa and Antia move very slowly up the stairs. Antia moves and moves very slowly. Then the voice comes around the corner. They think that it is not the trick of the wind, not a hallucination. Thapa says it is still



against the wall. Then at once, the voice asks with a sob "Where Shall I Go" (p. 17). Then Jago Antia nods and has nothing to say. Then some arrangement is made for an exorcist to be brought immediately.

An exorcist named Thakker comes to find out the spirit and he feels that it is a child. The exorcist says that it is very strong and it is unmovable, it looks very pale, something most terrible and so nobody can move out the child ghost. "It is most powerful because it is a child and because it is helpless and because it is alone. Only one who knows it and who is from its family can help it. Such a person must go up there naked and alone. Remember, alone and naked, and ask it what it seeks" (p. 23). Then Jago Antia walks slowly up the stairs alone, kicks off his shoes and unbuttons his shirt, his pulse is rushing in his head. Each heart beat is like an explosion. "What can you want from me? I was a child too" (p. 24). He comes to the end of the balcony and he goes down the memory lane in a flashback and shut his eyes. Chandra uses poetic prose to describe Antia's past and creates an atmosphere befitting the occasion:.

He (Antia) shut his eyes. Some where deep came the poisonous seep of memory, he felt it in his stomach like a living stream, and his mother was looking at him, her eyes unfocussed in a kind of daze. She was a very beautiful woman, and she was sitting in front of her mirror now as she always did, but her hair was untidy and she was wearing a white sari. He was sitting on the edge of her bed, his feet stuck out, and he was looking at his black shoes and white socks, and he was trying to, be very still because he did not know what was going to happen next (p. 24).

Then we are told about Sohrab, Antia's brother who has died very young and Antia's ancestry has been personalized. Haunted by the spirit of the boy, Jago Antia goes to the roof and comes face to face with it. Chandra depicts the whole scene in a matter of fact tone:



When Jago Antia stirred weakly on the roof, when he looked up, it was dawn. He held himself up and said, "Are you still here? Tell me what you want." Then he saw at the parapet, very dim and shifting in the grey light, the shape of a small body, a boy looking down over the edge towards the ocean. As Jago Antia watched, the boy turned slowly, and in the weak light he saw that the boy was wearing a uniform of olive green, and he asked, "Where shall I go?"

Jago Antia began to speak, but then his voice caught, because he was remembering his next and seventh birthday, the first party without Soli, and his parents holding him between them, soothing him, saying you must want something, and he looking up at their faces, at the lines in his father's face, the exhaustion in his mother's eyes. Burjor Mama sits on the carpet behind him with head down, and Amir Khan stands behind, and Jehangir shakes his head, nothing. His mother's eyes fill with tears, and she kisses him on the forehead saying!

"Baba, it's all right, let us give you a present," and his heart breaks beneath a surging weight, but he stands up straight, and looking at her and his father, he says, "I want a uniform." So Jago Antia looked at the boy as he came closer, and he saw the small letters above the pocket, J. ANTIA, and the sun came up, and he saw the body clearly, he saw the enormous dark eyes, and in the eyes he saw his vicious and ravenous strength, his courage and his devotion, his silence and his pain, his whole misshapen and magnificent life, and Jago Antia said, "Jehangir, Jehangir, you're already at home" (pp. 30-31).



The story is well-written, both about the Major's army days and also about the home where he comes to live in Bombay and his haunting child ghost. The language is used literally to create the battlefields and the small house in front of the eyes.

The first story comes to close with Thapa and Amir Khan offering Jago Antia a cup of tea in order to bring him back to reality. Chandra concludes the story with a note of relief, "Thank you", Jago Antia said, "Then they drank the tea together" (p. 32).

"Shakti" is the story of the rise of an ordinary girl who becomes rich in Bombay high society. The heroine, Sheila Bijlani is a pretty airhostess, who marries a man of wealth and wants to be accepted in the Bombay high society. She is ridiculed by her arch rival because she is neo-rich. Later in the story, Sheila's son and her rival's daughter fall in love. There is opposition from the girl's family but Sheila finds ways to circumvent all that stands between her family's happiness.

"Shakti" is one of the best stories of the five in *Love and Longing in Bombay*. This is the story of rivalry between two businesswomen of high society. Sheila Bijlani and Dolly Boatwalla are ill-disposed towards each other. She was the most glamorous air hostess, though the daughter of a shopkeeper. Her life changed when she marries Bijlani who is a U.S.A. returned electrical engineer. She marries him for his money. He is a square, fat and mostly quiet man: "Everyone made fun of him at the start, but they went and got married, and people rolled their eyes, and a year passed and then another and another, and then they suddenly reappeared with an enormous flat on Malabar Hill, and there was a huge intake of breath clear down to Bandra, and now the story was that she had married him for his money" (p. 35).



Dolly Boatwalla is a long horsy-looking, once she has introduced herself to Sheila, but Sheila has not minded a bit and she has taken it as part of her education. Sheila smiles at her. "You look wonderful, what lovely scarf" (p. 36). Dolly Boatwalla lives in her Boatwalla mansion. There is a Lunch Club in Bombay, dominated by Dolly. Sheila is willing to let Dolly have her way, but Dolly is a little more sagacious. Then she wants to teach Sheila a lesson. Her looks are far different from her behaviour.

Chandra portrays the women of high society in a manner. Sheila is rejected admission to the Lunch Club, strongly opposed by Dolly. In spite of her former rejection, Sheila finally succeeds in joining the Lunch Club. Here, Chandra gives a vivid description of the club:

The women in the Lunch Club met once a month for lunch at one of the members' houses. After lunch they played cards. Then they had tea and went home. That was it, nothing very exciting on the face of it, but if you knew anything you knew that was where marriages were arranged and sometimes destroyed, deals were made, casually business was felt out, talk went on about this minister in Delhi and So-and-So's son who was school captain at Mayo. It was the real stuff, you know, masala-grinding, how the world works. (p. 37).

Sheila wants to host a lunch at her house, but her arch-rival sniffs and rejects Sheila's proposal. In the meanwhile she makes friends. They pressure, persuade, and insist that Dolly should give a chance to Sheila. Finally, Dolly accepts it "All right, if you must, can we talk about something else, this is really boring" (p. 37). The Lunch Club meets next at Sheila's house for lunch. When the dish is served in the lunch, Sheila's son, Sanjeev is introduced to members and they smile at one another over his head. Mani Menon, Sheila's friend likes the boy. "Isn't he so cute?" (p. 39). Mani Menon said, but Dolly is



offensive. Chandra uses something of common language and slang and it is nearer to reality. The bitterness between Sheila and Dolly takes a new turn. Chandra brings a contrast between the two in a simple but forceful language:

Dolly was not perfect, she was long everywhere, she was sallow, she wore old jewelry sometimes missing a link here and there, today she wore a tatty green scarf over her shirt, and that was just it. Sheila was perfect, and she knew that however hard she tried she could never achieve the level of careless imperfection that Dolly flaunted. It had nothing to do with perseverance or intelligence and it took generations. It couldn't be learnt, only grown with the bone. It was absolutely confident and sure of itself and easy. Dolly had it and she didn't look at it honestly, Sheila knew this. She knew it and she was absolutely determined that if it took her the rest of her life, she would defeat Dolly. That it had come to open conflict she knew, and she would not stand losing. (pp. 41-42).

As observed by Francis King; Exceptional Chandra, whose second work of fiction this is, shows himself to be that rare thing, a writer who is simultaneously a master story-teller and a master stylist . . . In the virtuosity of its writing, now glimmering with mystery and now flashing with menace, "Shakti," is an account of the rivalry between two women in Bombay high society. Their battle is a story of colonial life by Somersert Maugham, so sharp is the irony and so vivid the characterisation. But such stylistic dazzle was beyond Maugham, always so unadventurous in his writing (1997, [www.vikramchandra.com/vc/pages/Reviews_Love And Longing.aspx45k](http://www.vikramchandra.com/vc/pages/Reviews_Love_And_Longing.aspx45k)). (*Spectator*).



Eventually Sheila launches a new club called the "Shanghai Club" with the help of Mr. Fong. Dolly is invited to join it, "There was another moment there, and then Dolly cleared her throat. I have been very busy, what with the children being at home. Trying to keep them amused is so trying. Freddie told me, he saw T.T. at the pool" (p. 56).

The feud between the two can be taken as a symbol of the conflict which develops rivalry between women of high society who can do anything for the sake of vanity. False sense of dignity and vulgar display of wealth are taken as a distinguishing mark of new culture in the present day society. The desire to show up oneself and look down upon others becomes a way of life with the so called upper class women in the metropolis of our country. No wonder that both Sheila and Dolly fall a prey to this kind of modern malaise and continued their war to the bitter end. Chandra rightly observes:

Sheila and Dolly had conducted a ruthless but fiercely polite war for years, in which the victories were counted in receptions given and famous writers annexed and huge sums collected for causes and the casualties were bruised egos of partisans of either side, who cut each other in Derby boxes and flicked razor-sharp looks over shoulders at openings. But there were some rulers, a certain code of conduct that kept it all civilized until the incident of the blackball" (p. 44).

Like Capote at his very best, Chandra reaches deep inside these lives and uncovers the longing for love in a child that can turn even the best laid plans of an astute mother upside down and the social order with it . . . Salman Rushdie has called Chandra flamboyant, and Chandra does write with the flash and dash of the great batsmen his cricket loving characters so admire. But what makes him even more satisfying to read is that his writing is as focussed, precise and accurate as the best of fast bowlers (The Citizen, Canada).



The story takes a dramatic turn when Sheila's son, Sanjeev falls in love with Dolly's daughter, Roxanne, and expresses his desire before his mother to marry the girl. She is about eighteen and a fair girl, with the milky Boatwalla complexion. Chandra uses here a terse language to appreciate her beauty "She and Sanjeev had known each other by sight before, but the last time he had seen her was when she had just turned thirteen" (p. 59).

Sheila is shocked but she keeps her cool. Dolly takes Roxanne to London. Sanjeev's agony on not being united with Roxanne shatters him and makes his mother realize the futility of her feud with Dolly. At the wedding of Asha, her servant's daughter Sheila observes that her relatives and Dolly's relatives have to gather under the same shamiana to bless the newly wedded couple, and that the children of both families, Roxannes's second cousin and her niece, play there. This makes her change her mind. She is willing to make amends by asking Dolly to marry her daughter to Sanjeev. The story ends with a hope "may be I'll tell you about that another evening" (p. 62).

Apart from exposing the hollowness of the feud in upper class society and the hypocrisy of high people to whom 'the rest of the world is invisible,' Chandra has made references to living personalities like Amitabh Bachchan and Tiger Pataudi in his effort to create new myths around them. This is certainly a daring act to mythicize the living heroes in the field of art and sports. Raja Rao made such an attempt in *Kanthapura* to mythicize Gandhi, the father of the nation. Chandra has also made references to several films of Amitabh Bachchan like *Coolie*, *Deewar*, *Sholay* and *Muqaddar Ka Sikandar*. He has also used a lot of Indian words without making an attempt at translation. The success of the story lies in the fact that he has effectively recreated his characters in their own situation.

However, according to
this story is more suited to be converted into a Bollywood movie



rather than a good book. Sheila as a person or the society, in which the story is set, fails to get the reader involved. Their fights, grievances and triumphs seem quite trivial. This is not to say that the rich cannot have their sorrows, but those depicted in the book fails to evoke any empathy in anyone. But then, the use of language is superb as ever.

The central and third story "Kama" is a bleak descent into the heart of darkness of Bombay corruption. Chandra portrays the main character, Sartaj Singh in a realistic way. In the best of these stories, 'Kama' a dandified police inspector, his marriage disintegrating, has the task of investigating the murder of a seemingly respectable and happily married man. There is an obvious suspect, an alcoholic drifter, who is found wearing the deadman's "Rolex" watch and who is arrested, then dies in custody. But like the Bombay slums through which the inspector travels, the labyrinthine investigation weaves through innumerable malodorous back alleys and cul-de-sacs before coming up with a far more bizarre solution. Such an intricate story might have been devised by H.R.F. Keating, creator of the splendid inspector Ghote.

Kama means desire. "Kama" is an erotic tale of desire and manipulation. Sartaj Singh, a police investigator discovers in himself a heart as carnal as that of the victim whose case he follows. His search becomes inconclusive as he sees his own potential for violence.

"Kama", dives deep into the intricacies of the life in the city of Bombay and exposes the hypocrisy of the so-called sophisticated people. Sartaj is sincere, honest and dedicated to his work. The Police Inspector investigates into the murder case of Chetanbhai Ghan Shyam Patel, gets drawn into the 'spiralling layers of corruption and deceit' prevalent in the society. The murder is a mystery. The deceased person, Chetanbhai is known to be a misanthropist but true to the society. But his death is an uncleared mystery "Chetanbhai was then a man who liked people to know the make of watch that he was wearing



and its exact and precisely calculated value” (p. 81). Kaimal, Chetanbhai’s neighbour who is about sixty, tells the investing officer. “Mr. Patel was a very helping kind of man” (p. 88).

Chandra explores the divorce situation characteristic of a sophisticated and too civilized culture of people in the cosmopolitan city, Bombay. As the irony of fate would have it, Sartaj also reflects upon his discontented married life that ultimately terminates in divorce. When the police officer receives the divorce papers, he succumbs to shock:

Even after the papers had come, after they had been sitting on their dining table for a week, he had never believed that the word “divorce” meant something real. In his whole life he had never known anyone who had been divorced. He had never known anybody whose parents had been divorced. He could not remember a friend who had known anybody who had been divorced (p. 100).

Sartaj is the victim of a failed married life. He loves one of his classmates, named Megha. They share their views with each other and wanted to become life partners, “he was worldly in a way that had been impossible all those years ago when Sartaj and Megha had been the talk of the campus” (p. 93). When he was investigating the mysterious murder case, he is informed of Megha seeking a divorce. The worst surprise is that Megha comes to the flat of Sartaj and informs him personally about her decision. Then he has no trouble recognizing the scene that he has imagined a thousand times. In Sartaj’s house they both sit side by side and then she unfolds the message. “I came because I thought I should tell you myself. A tiny shrugging motion with her shoulder, and a hand drawing up and touching her mouth. I don’t want you to hear about it like that, from someone else” (p. 117). She



declares that she has decided to marry someone, called Raj Sanghi who is her family friend and neighbour.

Sartaj's own married life (rather the failure of it), makes him understand the murdered Patel's wedded life who did everything for money and pleasure and closes the file: "Under his hands there was Chetanbhai's case file, closed. It was over, according to the file, and there was a murderer who had died in the hospital" (p.159).

Reviews of this story are highly complementary. According to Neil-Jillett, short fiction is rarely more powerful than Chandra's masterpiece "Kama", which has an intense complexity that Ruth Rendell (writing as herself and as Barbara Vine) might achieve if she slowed down . . . Chandra enriches this first-rate detective fiction by having the search for the killer reflected in Sartaj's parallel journey into his own heart and soul as he faces a messy divorce and doubts about his competence and honesty. As Neil Jillett says, Chandra never loses control of his sensational material, never allows us to have serious doubts about the 24-carat quality of his art. (*The Sunday Age, Australia*) (1997.[www.Vikramchandra.com/vc/pages/Reviews_Love And Longing.aspx45k](http://www.Vikramchandra.com/vc/pages/Reviews_Love_And_Longing.aspx45k)).

Sartaj, the inspector, investigates the murder case very dedicatedly. He watches each corner of the suspected places and people who are related and connected with Chetanbhai. The police team of Sartaj arrests Shankar Ghorpade who wears the dead man's "Rolex" watch and is known as a bad character, a beggar, suspected pilferer and drunkard who says, "I am a bewda. I don't kill anyone. I just wore his watch" (p. 83). Ghorpade is suspected because of the stolen watch. In the police custody, he dies in detention but turns out not guilty in the end. Parulkar who is senior to Sartaj in the department, asks Sartaj to close the case because there is nothing new for evidence. In the meanwhile, Sartaj interrogates Ghorpade, Kshitij Patel, son of Chetanbhai and the mother. Chetanbhai's car is scrubbed clean and no



blood stains are left. Parulkar pressurise of Sartaj to close the file "these are delicate times, Sartaj", Parulkar said, "pushing too hard, without sufficient reason, on that family could lead to, let us say, sensitiveness" (p. 110). Shantilal Nayak is the local M.L.A. and sitting Home Minister. He talks to Parulkar on phone and tells him not to pursue the case too far.

Ut Sartaj perseveres in his efforts to seek out the truth of the mystery. Kshitij Patel, the only son of Chetanbhai Patel, is about nineteen who has passed the H.S.C. examinations and got second rank in the State. At the beginning of the case, he seems to be innocent in his replies to the policemen's questions. The boy enquires, "Has the police found out anything about the murder"? When Sartaj tells him he can't talk about the investigation he nodded understandingly and lapses into silence. But afterwards, at the station, he couldn't stop talking (p. 86). Towards the end, he is known to be a member of "Rakshaks". "Rakshaks" is a registered organisation. It has an office which contains a large cyclostyle machine, a dark gym and a rack of lathis. They punish the wicked and maintain parallel law and order system of their own. They think their every work is righteous.

In an ironic reversal, it turns out that the murdered man, Patel, has connection with a racket that exploits women sexually and runs a flesh trade. And what is worse is that he has not spared his own wife, Ashaben. Chandra exposes the secret life of people who are given to crime and sex but project an honest image in public.

The police inspector, Sartaj tells to Kshitij that his father is a dependable, hard working and dedicated. He is helpful to others and a good husband in the family. When Kshitij listens to Sartaj about his father, at once he bursts into tears. "Kshitij eyes were watery and a trickle seeped from his left nostril. "He was not a good man". His voice came out thick and anguished. In all his years Sartaj had never seen a face so full of pain as this one" (p 152). The story comes to an



end not only with the closure of the murder case but with Sartaj's divorce of his wife, Megha. The wheel has turned full circle. Chandra does not offer solutions to the problems presented in the story. There are only hints and guesses, and it is for the discerning readers to read meanings into it.

According to the story offers the right mix of crime, drama and insightful character detail, and Chandra manages to spin a really good yarn. The story is open-ended and somewhat ambiguous, yet not desultory. And the character of Sartaj Singh is immediately compelling: the disciplined, talented policeman who is deeply conflicted and suspects that ultimately the biggest crimes—the ones we do to ourselves—can never be solved.

The fourth story "Artha" is about two gay men, Iqbal and Rajesh, and their lives in crowded Bombay. Both live with their parents who have no clue about their sons' orientations. One of them struggles hard to make money so that they can afford some private living space; till then they had to be contented with meeting in crowded buses and parks. Again there is another story within this story, that of a woman who employs Iqbal. One enjoys this story most because it brings out the contradictions in India quite well. Two people, who cannot declare their gay orientations, one woman who is struggling hard to set her business, another woman who is quite orthodox and discriminates on the basis of religious affiliations, all interacting together and achieving some kind of balance.

"Artha" has a triple, Chinese-box narrative structure. Here the narrator, Subramaniam is told the story by a stranger on the Rajdhani train, when he was travelling from Delhi to Bombay. Artha is also about gangsters and the underworld. The main characters in the story are two – Sandhya and the protagonist, Iqbal Akbar. The story combines a similar unresolved mystery with the more contemporary themes of the IT industry and gender preference. The story 'Artha' a



more conceptual within a story, is about a young computer specialist whose contempt for art as a language changes when his friend disappears.

There are other minor character Anubhav (Sandhya's lover), Latif (Sandhya's son), Vasant (Sandhya's ex-husband), Ratnani (a builder), Rajesh (Iqbal's friend, the missing postal clerk) and a few others. Rajesh and Iqbal meet Anubhav in Sandhya's house. Sandhya is madly in love with Anubhav. He is a painter who always talks in metaphors. "The long canvas had colour it at the top, a wash of red and colour in it at the top, a wash of red and yellows and black. In the painting, in the background, there was a poster for Deewar that one, you know, Amitabh Bachchan with the Coolie's rope around his neck and legs wide apart" (p. 170).

Gradually the story unfolds that Sandhya has a son, an ex-husband and a mother. Anubhav thinks he is smarter and better than everybody, else always makes it easy to enjoy with his trip. Sandhya calls Anubhav "Bohemian". It has for her meaning of pretty, and the person who lives with parents and does not get married. She is under Anubhav's supervision. They buy art books at crossword who big glossy affairs. Chandra comments "This is the trouble with people who get their first good sex when they're thirty. You tell them the truth and they talk about culture" (p. 172).

Rajesh and Iqbal acquire a taste for champagne at some high society parties. On one such occasion, Rajesh claims intimacy with Ratnam; a rich builder but is humiliated by him. Rajesh is upset and goes missing for many days. Iqbal bravely tries in every possible way to trace him but in vain. Iqbal searches for him and in the process encounters the gangsters, the underworld people and is beaten by them. The bhailog (the underworld people whose leader is Govardhan Bhai) plays trick on Iqbal. Iqbal describes in a matter of fact tone a scene in the underworld when he is tortured by them:



When I managed to focus my eyes I saw three uniformed guards with lathis in their hands standing over me. To the left there was a man in plain clothes, with hair cut short and a very straight back. In his hands he held a sten gun, the muzzle pointed directly at me. And stepping through the gate there was the man with the clipped moustache from the Atreya Lane gym (p. 209).

The story has reference to a communal riot which creates havoc. People belonging to different communities who have lived together for ages turned enemies in no time. Iqbal comes to know that Rajesh worked with some 'bhai log' and one of them was Ratnani. Iqbal has lost a friend, Rajesh, to the people of the underworld. The sub-inspector's cryptic reply, "in this life some people just vanish" (p. 227).

Chandra explains the deplorable state of life in the modern metropolis. Painting turns out to be more lively than life. Iqbal concludes the story by imagining what Rajesh would look like in a painting (because Rajesh, the person, is lost for ever). "I will lie in my long narrow room and look at the strong fingers holding the white cigarette and wonder what it is in the shapes that is Rajesh" (228).

Love and Longing in Bombay is . . . an important landmark . . . contemporary and real . . . It is Bombay which comes alive in these stories—Bombay where different classes collide, confront and coalesce in each other, because it is the only place in India where the power of capital is palpable and money has its own dynamic. It is a city full of fervour, always on the move and its people are devoid of that corrosive emotion of self-pity. Vikram Chandra has been able to capture this spirit, but also the influence of the criminal underworld and the communal politics which has cast a long shadow over Bombay, transforming it to Mumbai. According to Manini Chatterjee, "these stories . . . make no overt statement but bring alive the extraordinariness that mark the most "ordinary" lives." (1997).



*www.Vikramchandra.com/vc/pages/Reviews_Love
Longing.aspx4sk* (The Hindu, Chennai).

And

The final story, "Shanti" has the railway platform as the backdrop where a drama between two young hearts, Shanti and Shiv is played out. Shanti is in search of her missing husband and the boy is enamored by this lady. It has a happy ending but that is not quite the essence of the story.

This story is written in a different vein. It is here that the teller enters into the tale and the story gets a personal touch. Subramaniam, the teller of the stories, invites the narrator Rajiv Sharma to his house to listen to how he meets Shanti and marries her. Here are very few characters but they are convincing as human beings. Frankie Furtado, the Assistant Station Master at Leharia, puts Mrs. Shanti Chauhan, a second class passenger, in first class because she is very beautiful; there are two other characters Anuradha, Shiv's sister and Rajan, the station master and her sister's husband.

Shanti visits Leharia every two or three months. The Assistant Station Master only watches and he respects her when she comes to the station to provide her 1st Class waiting room and a cup of tea. When the young Shiv sees her at first sight in the waiting room, he falls in love with her in his heart. He eagerly asks the assistant station master where she goes. The A.S.M. replies:

"Yes", Frankie said. He stood up straight, alive with pleasure. "Twice before. She comes through every two or three months, I think. Looking so beautiful and so alone."

"Going where?"



“I don’t know. She catches a *tonga* outside the station. I think to the cantonment. Her attache has stencilling on it” (p. 237).

Frankie helps Shiv a lot to realise his love for Shanti. When she visits the town Leharia, Shiv misses her. At once, Frankie runs out of the station to find Shiv and informs him about this matter. Then Shiv goes in search of her on his cycle. “Shiv threw his leg over his cycle and skidded out into the rain. His plastic cap tumbled away and splashed into the mud but Shiv rode on, spraying an arc over the road. He rode hard, leaning against the pedals, feeling the water pull at the wheels in the deep parts” (p. 240-41). The very next day, she returns to the station to go away and is in the I Class waiting room in the Railway station. Shiv introduces himself, “My name is Shiva Subramaniam” (p. 242). In the meanwhile, Mr. Frankie serves her a cup of tea. After sometime Shiv starts to talk to her. He is informed that she is a married woman who is in search of her missing pilot husband. On being asked about her husband she says:

He was in the first batch of Indian fighter pilots in the RIAF. He was flying a Hurricane over Burma in 1942. They were protecting transports. They were attacked by Japanese fighters. The last his wingman saw of him was the plane losing height over the jungle. The plane was smoking. That was all they saw” (243).

She is hopeful of her husband’s return but gradually the hope recedes. In the meanwhile, Shiv Subramaniam takes interest in her and tries to win her over. Shiv likes her name which is very beloved to him. When he informs his friend and Assistant Station Master, Frankie.

At this point, Chandra introduces a story-within-the story and makes Shanti tell the stories to Subramaniam. She tells him how she



has met the man with the bluest eyes who is also the “most evil man in the world” (p. 245). Then she tells another story about Zingu who has died because he thinks “all men are equal” (p. 252). He asks for equality of status with other upper caste people. For showing this kind of courage, he is killed along with his son. Then Shanti tells stories about ghosts as to how they have cast their spell on Janamohini and makes us aware of nuclear warfare as it affects Amma. These stories are told to build a kind of intimacy between Shiv and Shanti. One day he proposes to Shanti and she responds in this manner: “A shudder passed over Shanti’s cheeks, a twist of emotion like a wave, and she turned her face to the side in pain, as if he had hit her. But then she looked up at him, and he could see that her eyes were full. He was running now. Yes, she said” (p. 262).

Then his friend, Frankie, wishes him very gladly, “God help this country, with lovers like you” (262). At long last Shiv proposes to Shanti which she accepts happily and they become wife and husband.

‘Shanti’ is the story in which a lonely railroad operator, whose twin has died, finds himself reviving in the presence of a hopeful widow. Chandra’s best detail in this story is in the photograph exchange between the lovers. Shiv gives her a photo of the twin saying, “Actually it’s Hari. But it doesn’t matter. We’re identical” (p. 265). She gives him a photo with her late husband “her hand rested on the epaulettes of his jacket” (p. 265). Each pleasantly accepts the other’s photo. Shanti means peace.

The story comes to a close with the narrator being introduced to Shanti, Subramaniam’s wife. The fitting conclusion to the series of five stories comes when the narrator Ranjit Sarma feels like asking Ayesha whom he loves to marry him, so that they can get into life. The narrator concludes the story with an assertion of life. “I know I am looking for Ayesha. I will stand before her building and when it is morning I will call up to her. I might ask her to go for a walk. I might



ask her to marry me. If we search together, I think, we may find in Andheri, in Colaba, in Bhuleshwar, perhaps not heaven or its opposite but only life itself (pp. 267-68).

The five stories are linked by the two characters: Shiv Subramaniam, who tells the stories, and Ranjit Sharma, who relays them to the reader. As says, the imputed language – i.e., the language in which the tales ‘would have been’ told were the characters ‘real’ – of the stories narrated by Subramaniam is not an Indian language but English, allowing for snatches of dialogue, phrase or song imputedly in other languages. It is the job of the frame-narrator Ranjit, acting as stand-in for the author, to transmit the stories to the reader, again in English

As described by Shashi Taroor: Vikram Chandra conjures up an India of glittering Bombay sophisticates, gritty policemen, high finance and low crime. At the core of the book are two novellas of rare narrative force a sureness of touch and mastery of structure that are deeply satisfying. *Love and Longing in Bombay* stands out of a considerable achievement, one in which the author marries his storytelling prowess to “a profound understanding of India’s ageless and ever-changing society . . . The beguiling self-confidence of Mr. Chandra’s prose is its own vindication . . . Today, a new breed of Bombayite—speaking Marathi, disdaining cosmopolitanism and espousing sectarian discipline and Hindu resurgence—has come to power, and the city is officially renamed Mumbai. *Love and Longing in Bombay*, Mr. Chandra is advertising his allegiances. In the face of the Mumbaiikars’ nativism, his writing—worldly, eclectic and humane—reaffirms the “old” Bombay” (New York Times Book Review) (1997, www.vikramchandra.com/vc/pages/Reviews-Love-And-Longing.aspx45k).

The only major defect of the book is a lengthy and ludicrous passage, of the kind now so often deemed obligatory in present day



fiction in which Chandra describes a sexual encounter between the police inspector and his estranged wife.

As says, the five stories in this collection, woven around the classic framing device of an old man telling stories in a bar, run the stylistic gamut: high comedy of manners, magical realism, fabulation, crime writing worthy of Elmore Leonard, heartbreaking romance. They also capture the richness and feel of Bombay itself, making the city into an “unspoken character”, like the aged recluse that no one in the family sees yet everyone’s life revolves around” According to “Kama” is a gripping tale of detection where the mysteries of the heart conquer the mundane resolutions of the police investigator. Singh, recently and irrevocably divorced from his wife, struggles with the dark places the failure of his marriage has taken him while trying to solve an apparently open-and-shut murder case. The story has all the familiar pleasures of the detective genre without descending into full cliché. As is the case with all superior examples of the genre, this can be attributed to the character of Singh himself. Singh is one of those creations that all writers secretly hope to stumble upon: the character who instantly compels with his believability. Reflective, moral, cynical yet filled with hope, Singh takes his place alongside the modern fictional detectives who simultaneously doubt and keep faith in the power of detection to make sense out of life as.” According to Vince Benedict, Scope Magazine, UK (1997.www.Vikram chandra.co m/vc/pages/Reviews_Love And Longing.aspx45k).

In *Love and Longing in Bombay*, Vikram Chandra has adopted a new technique of story-telling: the five stories in this collection are told by the same person and are interlocked with a dozen of shorter narratives, fused together as it were, by a ‘story-within-the-story’ technique. One reads these stories to see Bombay inside out. Violence, crime, activities in the underworld, club-culture, witch-hunting—all the negative qualities that dehumanize the modern man are highlighted in



these stories with consummate skill. What seems to be more important in this collection of stories, is the use of Indian words by way of code mixing, that successfully recreates, the characters in our own situation.

As Rigelhof comments; Chandra's fiction is street smart and politically aware, acerbic and romantic, virtuosic and driven by inner life, high-spirited and broadly comic, very contemporary yet rooted in popular traditions carried forward from Victorian times . . . Chandra's distinctive achievement lies in the ways he ingeniously connects that which is oldest and deepest within Hindu traditions with whatever is newest and most superficial in Bombay society while writing variations on genres of more westerly origin. . . In its breeziness, bitchiness, and drollery, "Shakti" is the verbal match of the gossip-driven stories in Truman Capote's "Answered Prayers".

As Virginia Crompton says, the five stories are all thought provoking stories, yet they are also stylish mysteries. Chandra's style is reminiscent of the nineteenth-century short story in his elegant plots and his interests in ghosts (in "Dharma"), high society (in "Shakti"), detectives (in "Kama") and gangsters (in "Artha"). But *Love and Longing in Bombay* is very much set in Bombay and in the twentieth century—the nostalgic poise of the prose is blended with the sweep and chaos of modern Indian city life. *Love and Longing in Bombay* is a thoroughly enjoyable collection written by an accomplished and promising writer (literary review, U.K.) (1997.[www. Vikramchan dra.co m/vc/pages/Reviews_Love And Long ing.as px45k](http://www.vikramchandra.com/vc/pages/Reviews_Love_And_Longing.as_px45k)) (*Literary Review*).

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ASSESSMENT OF NOISE POLLUTION CAUSED BY VEHICLES ON HIGHWAY IN NANDIGAMA ANDHRA PRADESH, INDIA

P. Rajanikanth

Lecturer in Physics
Kakani Venkataratnam College
Nandigama, Krishna Dt
Andhra Pradesh

Abstract

Noise is one of the popular pollution due to the rise in the utilization of heavy duty motor vehicles, We make sounds practically every seconds of our day, but to the extend it has reached an unfavourable high intensity which had cause many disturbances and irritation to others emotionally that has adverse effects on our daily activities. Since there are no sufficient studies on noise pollution in India, this study was carried out to determine motor vehicle noise levels in Nandigama municipality Highway NH 9 (NH 65 Now), this place is situated in Krishna District, Andhra Pradesh, India, its geographical coordinates are Latitude: 16° 48' 37" N, Longitude: 80° 18' 58" E. Noise measurement were taken in the morning and evening to determine noise pollution all over the highway as motor vehicle transportation noise. The results showed that noise should be the major environmental problems and studies aim at preventing it should have great priority.

Keywords: Nandigama Municipality, Highway NH 65, Noise, Motor Vehicles, Noise Pollution, Survey.

Introduction

Noise pollution is recognized as a major problem for the quality of life because of the increase in the number of motor vehicles and machineries in all over the world. Noise in cities has reached up disturbing levels. Residences far from noise sources and near silent



secondary roads are currently very popular. People prefer to live in places far from noisy areas. Many surveys addressing the problem of noise pollution in many cities throughout the world have been conducted and have shown the level of uneasiness that noise causes in people's lives depending on its duration and volume, the effects of noise on human health and comfort are divided into four categories; physical effects, such as hearing defects; physiological effects, such as increased blood pressure, irregularity of heart rhythms and ulcers; psychological effects, such as disorders, sleeplessness and going to sleep late, irritability and stress; and finally effects on work performance, such as reduction of productivity and misunderstanding what is heard. The municipality of Nandigama is a small municipality in terms of its population. This assessment was planned to determine the extents of noise levels in a municipality highway living area.

Noise Standards in India

Noise has been recognized as ambient air pollutant. Standards in this regard are laid down under environment (Protection) Rules, 1986 and under the Model Rules of the Factories Act, 1948. The Central Pollution Control Board constituted a committee on noise pollution control. The committee recommended noise standards for ambient air and for automobiles, domestic appliances and construction equipment, which were later notified in Environment (Protection) Rules, 1986 as given below in Table(1).

Table(1) Noise Standards for Different Category of Area

Area code	Category of Area	Limits in Day time dB	Limits in Night time dB
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silence Zone	50	40



Experimental

This study was conducted in 2013 in Nandigama NH 9 now NH 65 (Figure- 1) is located 49 km north of Vijayawada and 220 km west of Hyderabad. The river Muniyeru flows in the outer part of the town. Nandigama has four seasons; Summer is the longest extending from March to July and temperatures reach 49 degrees in mid May. Nandigama is a municipality covering many villages under its administration. There are approximately 41 villages under this municipality. Nandigama has one law-and order police station no traffic police station, a one assistant Sessions Court, 2 junior civil judge's courts, Government hospital, more than 20 colleges and 50 schools. Nandigama has long history sathavahanas ruled it later krishnadevaraya, kakatiyas the balija kings also. The town has a population of approximately 38227 people. Nandigama has APSRTC (state transport) bus station well connected to many major cities in A.P. The NH9 (NH65 now) which connects Hyderabad and Vijayawada passes through Nandigama. The town is well connected to Vijaywada. It is connected to river krishna which is 15 kms away at gudimetla ramannapeta village.

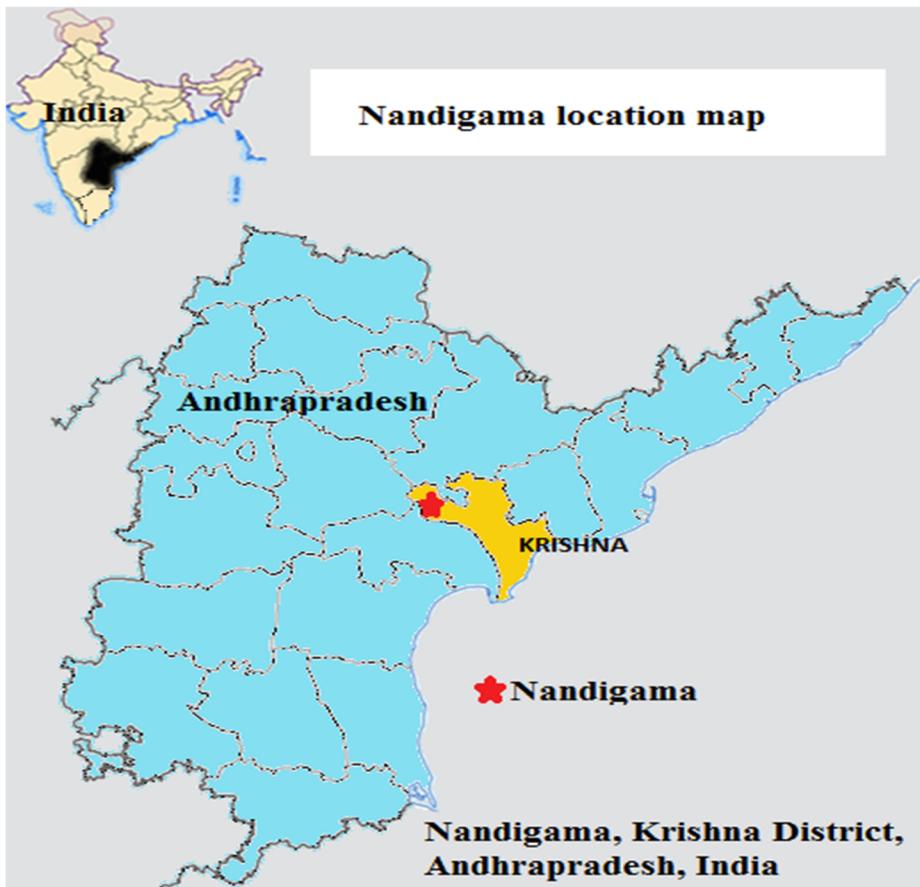


Figure 1: Location map of Nandigama Municipality

The first step of the assessment was to select the main places on NH 9 (NH 65 Now) which passes through Nandigama. Noise pollution was determined in 13 main places on highway NH9 (NH65 now) ((1)Highway by pass cross road towards vijayawada, (2) Ravindra bharathi school,(3)DBH girls school,(4)Sri chaitanya school,(5)Narayana school, (6)Lakshmi prasanna theatre,(7)DBH boys school,(8)New APSRTC bus stand,(9)Old bus stand centre,(10)Market yard,(11)Highway by pass cross road towards Hyderabad,(12)By pass chandapuram cross,(13)By pass ramannapet cross)) and how many types of vehicles go on this highway per hour is counted and where



noise problem takes place is determined. In addition, vehicle number according to their types was obtained from RTO Nandigama. On the highway most suitable 13 measurement places were selected for observations but only highest exceeded limit level data obtained. Measurements were performed on Monday, Wednesday and Friday. Noise measurements were conducted at 13 different places and data obtained at a height between 1.2 m and at a distance 2 - 3 m from noise sources. The study was carried out using the digital sound level meter (TES-1350A) and in addition, an external device is arranged to give warning when noise crosses the limit value of 55 dB (commercial area 65 dB and residential area 55 dB at day time) by beeping sound. In the present study, a noise sample size of 5 minute in each hour was taken at the selected place. Noise sample were collected in dB (A) scale at every 30 second interval (i.e. 2 counts per minute) or total 10 readings in one sample size. The continuous monitoring of noise level was observed during 8:00 am to 03:00 pm and 5:00 pm to 10:00 pm. A noise map of the Nandigma NH 9 (now NH 65) was created after the evaluation of the data and the results of three highest noise places in residential area are indicated in the map (Figure-2).

Results

Evaluations on noise Measurement were based on limit values of CPCB standards by law in India and highest noise values are found at 3 of 13 measurement places in the highway at Lakshmi prasanna centre, New APSRTC bus stand, Old bus stand centre, which are shown in the location map (places 6,8,9). All the days the recorded values are more than the limit values. The maximum noise pollution is recorded is during the passage of Lorries and buses when blowing horns which is notable.

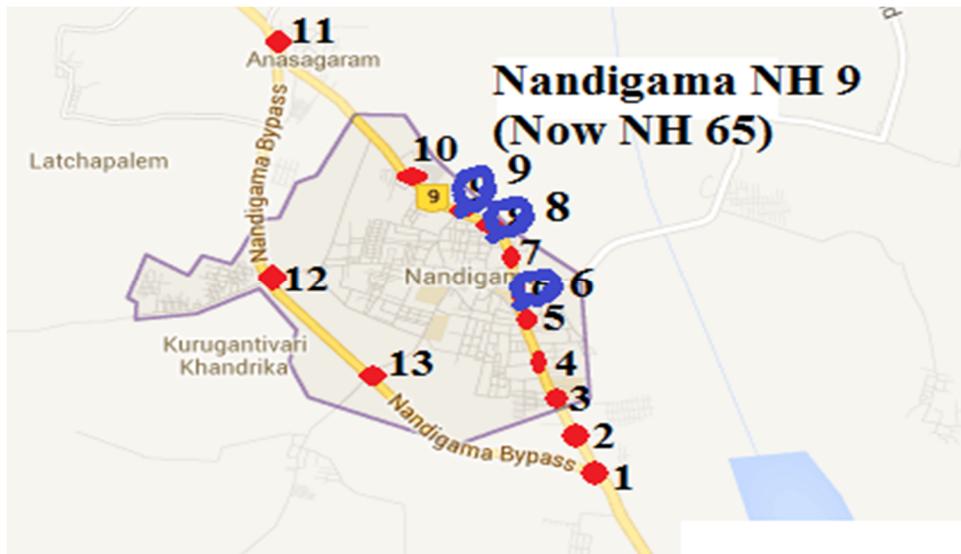


Figure 2: Three highest noise places in residential areas

Noise intensity dB(A) at location place No.06 (Lakshmi prasanna centre)

S. No.	Time/hour	Min. dB(A)	Max.dB(A)	Average
1	8 to 9 AM	47.6	50.2	48.9
2	9 to 10 AM	65.4	98.3	81.8
3	10 to 11 AM	62.3	95.2	78.7
4	11 to 12 AM	60.1	78.4	69.2
5	12 to 1 PM	61.5	65.6	63.5
6	1 to 2 PM	51.6	60.2	55.9
7	2 to 3 PM	60.4	69.3	64.8
8	5 to 6 PM	65.6	106.5	86.0
9	6 to 7 PM	63.2	96.5	79.8
10	7 to 8 PM	64.2	101.5	82.8
11	8 to 9 PM	60.1	107.5	83.8
12	9 to 10 PM	62.3	112.6	87.4



Noise intensity dB(A) at location place No.08 (New APSRTC Bus stand)

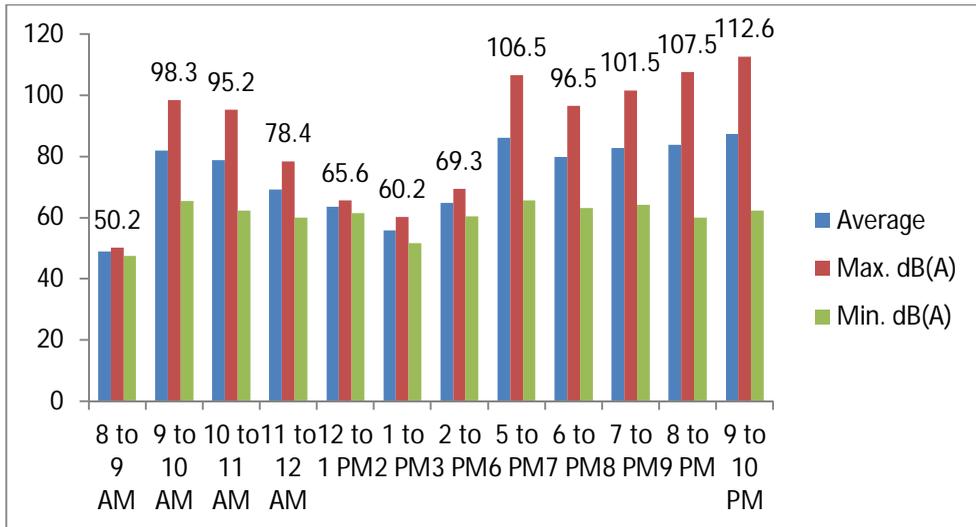
S. No.	Time/hour	Min. dB(A)	Max. dB(A)	Average
1	8 to 9 AM	49.2	50.6	49.9
2	9 to 10 AM	66.5	108.3	87.4
3	10 to 11 AM	60.3	94.2	77.2
4	11 to 12 AM	62.1	80.4	71.2
5	12 to 1 PM	60.5	66.6	63.5
6	1 to 2 PM	52.6	61.2	56.9
7	2 to 3 PM	63.3	69.5	66.4
8	5 to 6 PM	68.5	109.5	89
9	6 to 7 PM	63.8	115.5	89.6
10	7 to 8 PM	65.2	104.6	84.9
11	8 to 9 PM	65.3	103.5	84.4
12	9 to 10 PM	62.3	108.3	85.3

Noise intensity dB(A) at location place No.09 (Old Bus stand centre)

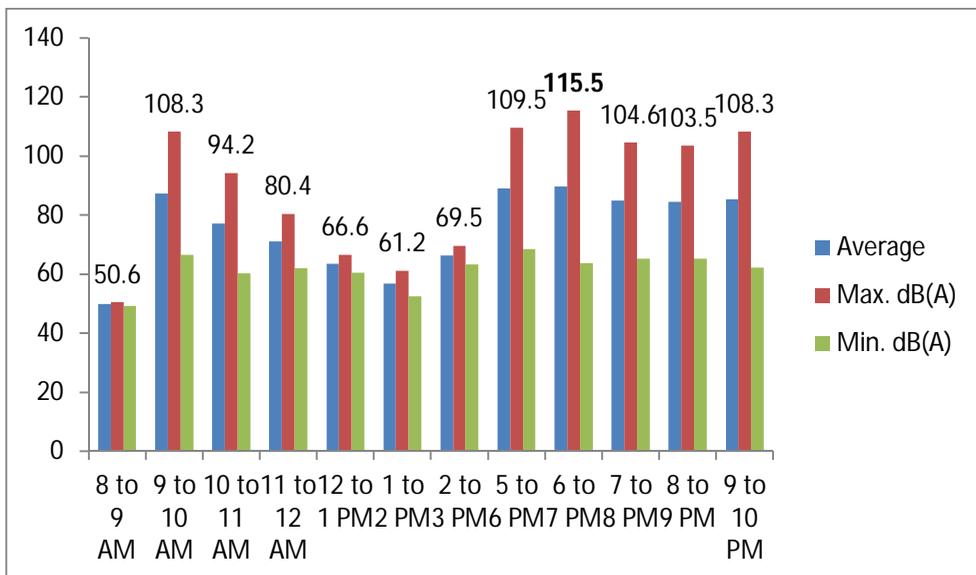
S. No.	Time/hour	Min. dB(A)	Max. dB(A)	Average
1	8 to 9 AM	45.6	60.2	52.9
2	9 to 10 AM	55.4	99.5	77.4
3	10 to 11 AM	62.6	90.4	76.5
4	11 to 12 AM	56.5	75.8	66.1
5	12 to 1 PM	61.8	68.6	65.2
6	1 to 2 PM	52.3	61.2	56.7
7	2 to 3 PM	59.4	89.3	74.3
8	5 to 6 PM	62.5	101.5	82
9	6 to 7 PM	60.2	110.8	85.5
10	7 to 8 PM	64.4	102.4	83.4
11	8 to 9 PM	63.5	108.5	86
12	9 to 10 PM	63.5	105.5	84.5



Noise intensity dB(A) at location place No.06 (Lakshmi prasanna centre)

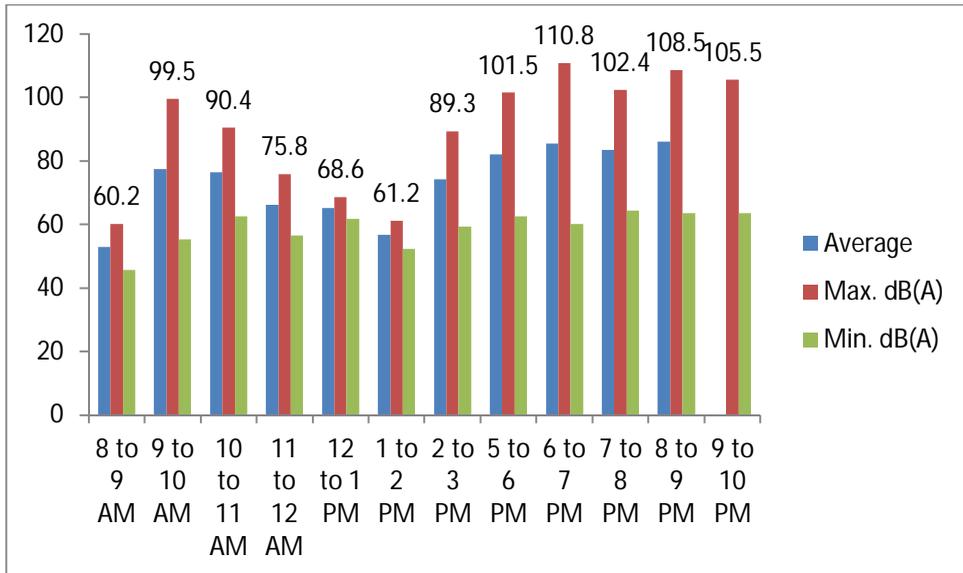


Noise intensity dB(A) at location place No.08 (New APSRTC Bus stand)

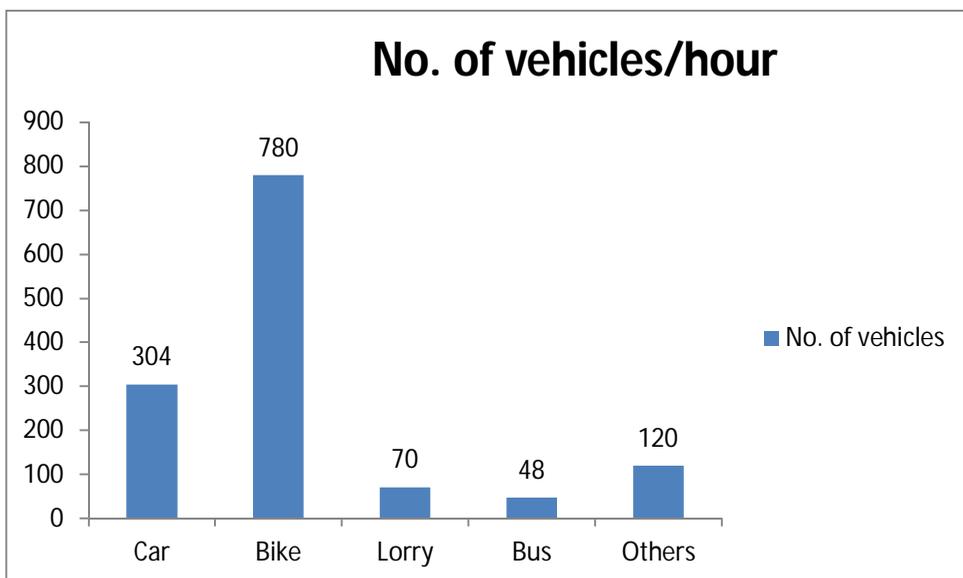




Noise intensity dB(A) at location place No.09 (Old Bus stand centre)



The number and the Type of the vehicles passing on the Location place No. 08 in an hour

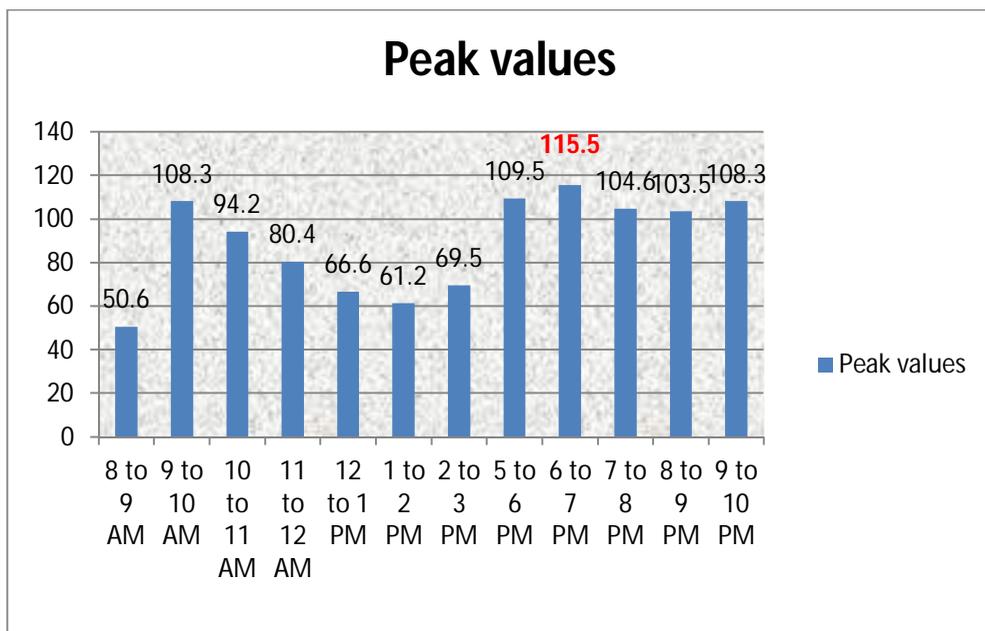




Discussions

It was observed that the level of Noise Pollution during passage of vehicles is much higher when compared with the standard limits. The highest sound levels recorded at three places in Nandigama highway which are shown in the location map (Figure 2), The results were surprising in these three places particularly in location place No. 08 from which all the vehicles travels at a time. In place No. 08 maximum sound level of 115.5 decibel is observed. In general at all the places the sound level is observed to be much greater than the permissible limit.

Noise intensity peak dB(A) at location place No.08 (New APSRTC Bus stand)



Conclusion

From the observations taken at the selected places, it was found that the sound exceeds permissible limit of 55 dB for residential and 65dB for commercial area. On all study at the selected places the maximum



noise limits were ranging between 50.6 dB to 115.5 dB. The people staying in noisy area especially above 70 dB(A) should take precautionary measures in order to avoid noise induced hearing loss, deafness, heart attack, increase in cholesterol, high blood pressure, hyper tension, causes emotional disturbance, constriction of blood vessels. Motor bikes also cause a considerably high noise level; therefore, people should be encouraged to use bicycles on their ways to work. In addition, use suitable silencers for vehicles and noise preventive devices, ear muffs, suitable road covering materials, changing road elevation, increasing the public awareness. Therefore, protections related to planning, technical, biological, legislative and educational issues should be taken in order to avoid negative effects of noise pollution on environment. We have to strive for the development of the country.

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कालिदासकाव्येषु अध्यापकः

डा. चुक्का प्रवीणः

रीडर् , संस्कृत विभागः ,

आन्ध्रा क्रिस्टियन् कलाशाला ,

गर्तपुरी , आन्ध्रप्रदेशः ।

चरवाणी - ---७-म्हल्लम्हन्-

विद्युत्सूत्र - chukkapraveen689@gmail.com

विदन्ति अनया विद्या।

यया ज्ञातया ज्ञानमुत्पद्यते सा विद्या॥

इति विद्या शब्दार्थः । पुराकाले वेदविद्यैव विद्या शब्देन व्यवहियते स्म । शास्त्राणि वेदाङ्गानि इति व्यवहृतानि । खगोलशास्त्रे ज्योतिषे , भौतिकशास्त्रं च न्यायशास्त्रे अन्तर्भूतमिति तदानीं व्यवहारो दृश्यते । ऋग्यजुस्सामाधर्वणकाः चत्वारो वेदाः । शिक्षा , व्याकरणं , छन्दशास्त्रम्, निरुक्तम् , ज्योतिषम् , कल्पः इति षट् वेदाङ्गभूतानि शास्त्राणि । यज्ञ फलबोधिनी यज्ञक्रियाविशेष द्योतिका च मीमांसा । पदार्थ विज्ञान निरूपकं न्यायशास्त्रम् । अष्टादशपुराणानि लौकिक धर्मबोधकं धर्मशास्त्रमिति चतुर्दशविद्याः पुराकाले प्रसिद्धाः ।

प्रायशः सर्वत्र वाङ्मये सवेषां कवीनां ग्रन्थेषु च एताः एव विद्याः उदाहृताः । कालिदासोऽपि एवमेव चतुर्दश विद्याः उदाहृतवान् । किन्तु , योग्यः अध्यापकः कीदृशो भवेत् , योग्यस्य शिष्यः गुरौ कथं वर्तनीयः इति विचारः केवलं कालिदास काव्येष्वेव उपलब्धते । लोके गुरवः शिष्यं सद्विषयकमेव ज्ञानं बोधयन्ति । असद्विषयकं च परिहरन्ति । एवं सति सद्वृत्तिः कथं भवतीति ज्ञात्वा शिष्यः सुखी ज्ञानी च भवतीति आचार्याणामाशयः । कालिदासस्तु गुरुभिः असद्विषयमपि उपदेष्टायमेव यद्ज्ञानेन शिष्यः असतः अत्मानं रक्षितुं प्रभवति तदाचरणे विमुखो भवतीति सूचितवान् । गुरुः सदसत्



विषयकं ज्ञानमुपदिशति सन्मार्गमेव अनुष्ठेयः इति शिष्यमनुशास्ति इत्यपि बोधितवान् ।

नयविद्भिः न वेराज्ञि सदसत्योपदर्शितम् ।

पूर्वं एवाभवत्पक्षः तस्मिन्नाभवदुत्तरः ॥

इति रघोः विद्याज्ञ्यास विषये सूचितवान् । न केवलं राज्ञामेव एष विषयः

आचरणीयः, किन्तु साधारणोऽपि विद्यार्थी तथा भवेत् ।

मालविकाग्निमित्र नाटके आचार्यः केवलं वैतनिकः न भवेत् अर्थात् मम अनया वृत्या वेतनलाभो भवति, बोधने अबोधने च न मे रूप्यकमपि परिहीयते । अतः यथावकाशमेव बोधयामीति अद्यतनाचार्यैव पाठने अश्रद्धालुः न भवेत् । मे पदवी शाश्वती ततो मां न कोऽपि चालयतीति प्रयत्नेन आचार्याणां तथा व्यवहारो भवति । श्रद्धालुः आचार्यः स्व ज्ञान वृद्धये शिष्यं बोधयितुं च सदा जागरूको भवेत् । विद्याविषयिकाः चर्चाः अपि शिष्यैः सहोपाध्यैश्च अयं कार्या । यदि स्व मतं समीचीनं तत् स्थापने भीरुरपि माभूत् । तथा सति परैः निन्द्यो भवति । परिहास्यश्च भवतीति उपाध्याय रीतिं वर्णितवान् ।

लज्धास्पदोऽस्मीति विवादभीरो -

स्तितिक्षमाणस्य परेण निन्दाम् ।

यस्यागमः केवलजीविकायै

तं ज्ञानपुण्यं वर्जितं वदन्ति ॥

---मालविकाग्निमित्रम् । व-क्त्र

आस्पदशब्दः प्रतिष्ठार्थकः । “ आस्पदं प्रतिष्ठायां ” इति सूत्रेण निपातितः । नेयं प्रतिष्ठा कीर्तिरूपा । किन्तु, स्थिरस्थानरूपा इति रूपते अन्वेया । यशोरूप लज्धप्रतिष्ठः विवादरूपः यशोहानिर्भवतीति विवादात् न भीतो भवति । यः पदव्यां लज्धस्थैर्यः स एव भीतो भवति इति कालिदास आशयः ।



उज्जमः आचार्यः कीदृशो भवेदिति तत्रैव नाटके कालिदासः दर्शितवान् । अधीतिः,
बोधः , आचरणं , प्रचारः इति विद्यायाः चतस्रः दशाः भवन्ति ।

अधीतिः - कण्ठस्थीकरणं , धारणं च ।

बोधः - तद्विषयकं ज्ञानम् , अर्थावगतिश्च ।

विद्याज्यास समये विशेषतः एतद्व्यमद्यापि अपेक्षितं भवति । केवलमधीत्य यः
अधीतस्य अर्थं न जानाति सः भारवाहक गार्धभतुल्यः इति वेदशास्त्रेषु दृश्यते । अधीतिः
विद्यार्थिभिश्च कर्तव्यम् । किन्तु बोधनं अध्यापकस्यैव भवति । बोधयितुं उपाध्यायः
शक्तः प्रवीणस्य भवेत् । वचः कौशलेन स्फुरद्रूपणे च क्वचित् गुरुः शिष्यमतिं आकृष्य
तं बोधयितुं प्रभवति । सैव शक्तिः संक्रान्तिः उच्यते । या विद्या गुरौ स्थिता तां शिष्ये यो
गुरुः संक्रमयितुं प्रभवति सः श्लुध्यः । यद्यपि संक्रान्तो प्रवीणः स्वयं अध्याप्य विषये
असमर्थः गुरुः केवल संक्रान्ति कौशलेन न शोभते । अतः सद्विद्या श्लुष्टाऽपि गुरोः
मुखस्था उपस्थितौ विद्यमाना च भवेत् । एवं स्व विहितं शिष्ये यस्संक्रमयितुं प्रभवते
स एव उज्जमः उपाध्यायः इति कालिदासः स्पष्टमुक्तवान् ।

श्लुष्टा क्रिया कस्यचिदात्मसंस्था

संक्रान्तिरन्यस्य विशेषयुक्ता ।

यस्योभयं साधु स शिक्षकाणां

धुरि प्रतिष्ठापयितव्य एव ॥

---मालविकाग्निमित्रम् । व-क-

एवं गुरुः स्वयं शास्त्र विषये स्वयं पण्डितः शिष्याध्यापने श्रद्धालुः , विवादेज्यः
विद्याविषयेज्यः न भीरुः , केवल स्वोदारपूरणेन न तुष्टः उज्जमोपाध्यायः इति कालिदासः
स्पष्टमुक्तवान् ।

एवं विधमाचार्योपलज्य मन्दोऽपि शिष्यः कुशाग्रबुद्धिः भवति । गुरुणा शिष्ये



स्थितं बुद्धिमान्द्यं प्रथमं परिहरणीयम् । तदैव स शिष्यः अध्यापयितुं योग्यो भवति । यथा पङ्केन कलुषितं पयः पानयोग्यं न भवति तथा मन्दधीः शिष्यः विपश्चितं गुरुं लङ्घ्वा मूर्खोऽपि शिष्यः बुद्धिमान् भवति । कलुषित पयसि अङ्गोलबीजगन्धक्षेपणेन पयः प्रसाद्यं भवति । ततः सुपेयमपि भवति । एवं गुरुः शिष्ये प्रथमं जाड्यापनोदनं कुर्यादिति कालिदासेन सूचितम् --

मन्दोऽप्यमन्दतामेति संसर्गेण विपश्चितः ।

पङ्कच्छिदः फलस्येव निकषेणाविलं पयः ॥

---मालविकाग्निमित्रम् । क-क-

प्रकृष्टं निश्चिनोति चेतति चिन्तयति वा विपश्चित् । “ पृषोदरादीनि यथोपदिष्टम् ” इति निपातनात् साधुः (पा . सू . ऋ-फ-क-) । गुरु विषये विपश्चित् शब्दः अत्र साधुप्रायः । विद्वान् विपश्चित् दोषज्ञः इत्यमरः (ख-ख-भ-) । रामाश्रमी व्याख्यायां तत्रैव पूर्वोक्त क्रियात्रयात्मिका व्युत्पत्तिः विपश्चित् शब्दस्य निरूपिता । अस्यायं पाठ्यक्रमः , बोधनक्रमः , योग्यः इति शिष्यविषये गुरुः स्वयं निश्चिनोति । कृतनिश्चयो भवतीत्यर्थः । ततः स क्रमः विषयो वा स्वयं ज्ञातश्चेत् बोधयति चेतति इत्यर्थः । पुनः किमेष अवगन्तुं शक्तः इति स्वयं चिन्तको भवति । एवं निश्चायकः , चेतकः , नित्यचिन्तकश्च उपाध्यायो भवेदिति अत्र कालिदासः स्पष्टमुक्तवान् । यदि गुरुः अनर्हाय उन्नमं विद्यां ददाति , स तां धारयितुं अन्यं बोधयितुं न शक्नोति । अतः किमर्थमियं विद्या अयोग्याय दत्ता इति गुरुः आत्मनः कृत्यमनुशोचति ।

शाकुन्तले एवमयोग्याय विद्यां दत्त्वा तान् विद्यां गुरुः अनुशोचति इति एकत्र उक्तवान् । शकुन्तलां पतिगृहं गमयन् कण्वः तां योग्येन परिणीतां ज्ञात्वा अभिनन्दति । “ वत्से ! सुशिष्य परिदत्तेव विद्या न शोचनीयोऽसि संवृज्जा ” इति । योग्ये शिष्ये दत्ता



विद्या मौक्तिकशुक्तौ पतितं अङ्गभः इव उज्जमां स्थितिं प्राप्नोति । अन्यथा तप्तायसि पतितः
जलबिन्दुरिव नष्टा भवति । योग्येन आचार्येण अनुशिष्टः शिष्यः तां सार्थकीकृत्य आचार्यस्य
यशसः परिवर्धको भवति । अस्मादाचार्यात् इयं विद्या मया प्राप्ता इति यदि शिष्यः परैः
श्लूढ्यमानायां स्व विद्यायां वदति तदा एवं विधस्य प्रतिभाशालिनः आचार्यः सर्वदा
श्लूढ्यः इति गुरुरपि मान्यो भवतीति कालिदासः स्पष्टमुक्तवान् ।

पात्रविशेषे न्यस्तं गुणान्तरं व्रजति शिल्पमाधातुः ।

जलमिव समुद्रशुक्तौ मुक्ताफलतां पयोदस्य ॥

---मालविकाग्निमित्रम् । क-क-

एवं कालिदासेन उक्तानि आचार्य लक्षणानि संक्षेपतः उदाह्रियन्ते ।

क. विद्याविषये अध्यापकः कदापि चर्चायाः न भीतो भवेत् ।

ख. धनमात्रलाभेन तुष्टः अध्यापने प्रमज्जो न भवेत् ।

फ. स्वयं च बोध्यविषये पण्डितो भवेत् ।

ब. शिष्ये स्वाधीनं संक्रामयितुं कुशलो भवेत् ।

भ. शिष्य योग्यतां परीक्ष्यैव विद्यां दद्यात् ।

म. शिष्यमेधामनुसृत्य कीदृशी विद्या , कियत् अवधेया इति निश्चित्य शिष्यम्
अध्यापयेत् ।

एवं योग्ये शिष्ये निक्षिप्ता विद्या समुद्रशुक्तौ वर्षाङ्ग्यः यथा मौक्तिकं भवति
तथा प्रकाशितां व्रजति गुरोः प्रतिष्ठां प्रज्यापयति च ।



BUSINESS ETHICS – ENVIRONMENTAL CHALLENGE

M. Ramakrishna

Lecturer in Economics
The Adoni Arts & Science College
Adoni, Karnool

D. Nalini

Lecturer in Zoology
The Adoni Arts & Science College
Adoni, Karnool

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We all know that the civilizations evolved along rivers with good environment. The inter connectedness of the human existence on the earth is most clearly reflected when we discuss questions of environment and ecology. Growing environmental pollution across the Globe has been a cause of concern to everyone. Rapid Industrialization and development have only expedited to the destruction. Carbon trading is like any other market trading. The Humans only think their economic welfare with environmental goods. The operative term is 'interrelationships,' implying that an interdependence exists among all entities in the environment". Many companies discharge waste into water bodies, particularly rivers. If the toxins kill certain plants in a river, then many fish could also die. Animals can die from toxins, such as air pollution; and they can die when they lose their habitat. The meadow eventually loses all its grass and the villagers are left with a serious problem of having no way to feed their animals. Most people think that either those who are responsible for environmental damage or those who benefit from it should pay the costs. Consider each possibility. Trade and its impact on the environment is one of the most important ethical issues not only because harming the environment often violates our right to non injury. Businesses traditionally saw no need to protect animals, but many moral philosophers no longer see any reason to value ourselves over other animals at any cost.



The human society has been killing birds and animals since human life started he acquired the skill of hunting for this survival. Hunting was his main profession during their time. Even hunting was the means of survival in those times. But it is continued to destroy the animals birds even after evolution of the civilization.

Do humans have any ethical obligations with respect to the nature world?

We all know that the civilizations evolved along rivers with good environment. The environment is playing a definite and positive role in survival of the mankind. With environmental problems, each year Natural and manmade disasters often cause the thousands of deaths of Humans and Animal life, injuries and loss of property, infrastructure and assets substantial economic losses.

It's a well known fact that resulting in the early (or) ancient civilizations in the world to collapsed because of ecological factors. The inter connectedness of the human existence on the earth is most clearly reflected when we discuss questions of environment and ecology. The long debate about environment and development is not yet settled even while the nations struggle to find a model of sustainable development without destroying the ecology.

When the Modern Human Civilization increases on the earth with its enormous wants, the Environment is destroyed. Growing environmental pollution across the Globe has been a cause of concern to everyone. Rapid Industrialization and development have only expedited to the destruction. The Multinational Companies have been utilizing over indiscriminately the natural resources for increasing their profit. Carbon is an element stored in fossil fuels such as coal and oil when these fuels are burnt, carbon dioxide is released. Carbon trading is like any other market trading. Carbon has been given economic value allowing people, companies (or) nations to trade it.



Most of the valuable and rare species have become extinct by Human business activities. The Humans only think their economic welfare with environmental goods. The disappearance of valuable and rare species and plants aggravated the loss of ecosystem and new drugs. Adams elucidated the pressure balance among environmental, economic and social functions under a sustainability frame work.

Business and Ecology

Businesses damage the environment when natural resources are taken from the Earth and waste is disposed. All of this is done within the natural environment, a kind of ecological system or "ecosystem." *Ecology* refers to the science of the interrelationships among organisms and their environment. The operative term is 'interrelationships,' implying that an interdependence exists among all entities in the environment". For example, a river is an ecosystem that contains a large number of living organisms that exist in a complex web of dependence and interdependence.

Many companies discharge waste into water bodies, particularly rivers. Sometimes this is relatively harmless to the ecosystem, but increasing the amount of waste could become too toxic for some of the organisms living there. If the toxins kill certain plants in a river, then many fish could also die. This in turn could role fishermen of their jobs who make a living by catching fish in the pond. All of the damage done to the pond, fish, and fishermen are "externalities" or "spillover"—costs to third parties. Business transactions aren't always just transactions between two people during trade. Sometimes other people and nonhuman entities are also harmed by business transactions.

Imagine that a company dumps twice as much pollution into a river to save Rs. 6,00,000/- a year, but it kills the fish in the river. The fishermen lose nearly Rs. 7,00,000. a year a result of the pollution as their primary source of income is lost. In that case, the company's



decision to dump more waste into the river actually causes more harm than good. Hence it's unfair to earn money at the expense of pollution when other people have to struggle to earn to pay for those profits.

Moreover,, financial loss isn't the only one we are dealing with. The fish and other animals and plants that eat the fish are also harmed. It's not justified that we have a right to harm animals indiscriminately to save money or make money. However, whenever we take the Earth's resources or pollute, animals are often harmed. Animals can die from toxins, such as air pollution; and they can die when they lose their habitat.

Is it always Justified to intrude into ecosystems and harm living organisms? It seems unlikely to me given how impossible and impractical it is. It's almost impossible to do business without causing harm to ecosystems because the Earth's resources are vital to conduct business and sell products, and many companies have no choice but to dispose the waste and pollute one way or another.

It's not obvious to me how damage done to the environment is Sanctioned, nor is it obvious to what extent people are justified to harm the environment. Nonetheless, it's morally desirable to do so as little damage as possible while conducting business and attempting to make a reasonable profit. It's possible for a company to lose all profit in an attempt to protect the environment, but it seems unreasonable to think that all companies should lose their profits to environmental protection. There might be some companies that are so perilous and harmful that they shouldn't exist in the first place, but many companies that harm the environment only do so because it's necessary to meets our needs.

Business's traditional attitudes towards the environment

Businesses have traditionally shown egregious indifference towards the environment. Environmental protection was rarely seen as an issue. A



company would harm the environment to whatever extent was possible to become profitable, and they often harmed the environment despite the fact that it was unwarranted to do so. Shaw discusses the attitudes of businesses that lead to unwarranted environmental damage. In particular, people saw the "natural world as a 'free and unlimited good'". People at one point, thought that the world's resources could be exploited without an end and without any morally significant harm done. Pollution could damage the environment, but the damage done was considered to be insignificant because the world is abundantly rich in resources.

However, resources aren't unlimited and many people and animals are harmed from environmental damage. In Garrett Hardin's parable, "The Tragedy of the Commons," he describes the importance of the environment to human interests based on the fact that it's limited. He describes the villages which share a pasture and let farm animals graze indiscriminately. The meadow eventually loses all its grass and the villagers are left with a serious problem of having no way to feed their animals.

Hardin's parable is often relevant to real life issues, such as overfishing. If the fish population is depleted by fishermen, then the fishing industry will go out of business.

The Morals of Environmental Protection

How is the environment relevant to business ethics? First, it's in our interest to protect the environment insofar as we are human beings and we are often harmed by environmental damage and measures to protect the environment can benefit us all. Second, many people don't feel responsibility for harming the environment because they don't personally do much harm to it. Third, companies that harm the environment have externalities (and harm others) that they unfairly benefit from, which can violate our right to non-injury (ibid.). I would



like to add that externalities can also be in the form of harm done to animals and plants.

The costs of pollution control

How much effort and cost should we devote to protecting it ?

We can protect the environment by implementing standards on the companies and limit the amount of pollution allowed thus, and we can try to protect the environment and do what is necessary to restore it back to a balanced state. Of course, the costs of protecting and helping the environment can be expensive, and people don't want to pay those costs. How do we decide when we must pay greater costs to help the environment?

One possibility is a cost-benefit analysis. We can assess the harm and the benefits done to people by harming the environment. Consider a company that pollutes twice as much nearly to save Rs. 10,000 in production costs. If the harm done to society by doubling the pollution is nearly Rs. 1,30,000 from health costs and sick days, then it seems to be immoral for the company to double its level of pollution. Although it's hard to link pollution to specific sick days and medical costs, imagine that we could. In that case, it would be just to charge the company with the Rs. 20,000 worth of sick days and medical costs, so the company would actually lose money by increasing pollution.

However, the cost-benefit approach is often an impractical approach and it might be impossible to know how much harm a company's environmental damage is worth. Additionally, the cost-benefit approach isn't just about money. We have to consider the pain, suffering, and death that can be caused by pollution; and that might be impossible to measure. That's especially true if we have to consider the damage done to trees and plants.



Who shall pay the costs?

No one wants to have to personally pay the costs to protect and restore the environment. Most people think that either those who are responsible for environmental damage or those who benefit from it should pay the costs. Consider each possibility:

1. **Those responsible** – The problem with this answer is it's not entirely evident who's responsible for harming the environment. Even if we all agree that big business harms the environment the most, they don't all harm it equally and it's hard to assess the actual damage each business does. Some people have argued that consumers are to blame for harming the environment because they demand products at a reduced cost and buy products from companies that disproportionately harm the environment. However, Shaw claims that urbanization, Consumerism, and a growing population are to blame; so we are all somehow responsible for harming the environment. That might be true, but I don't see how that excuses the companies from harming the environment more than is necessary just to raise profits and make others suffer from their decision; nor do I see how it excuses consumers from buying indiscriminately from the companies known for abusing the environment or buying unnecessary goods that cause harm to the environment.
2. **Those who could benefit** – The Companies that harm the environment indiscriminately can benefit the most and it's often others who are harmed the most from environmental damage, so it might be most appropriate for them to pay the most to protect and restore the environment. However, Shaw argues that this is not a good proposition because we all benefit from harming the environment "albeit, not to the same degree". Again, I don't see how this objection can be taken seriously



given how much more some people benefit from pollution than others Shaw even mentions that “flagrant polluters” benefit from polluting much more than others. Additionally, Shaw argues that this proposition ignores the importance of responsibility, and I agree that there is something strange about making people pay costs for something they aren’t responsible for. Imagine that I steal Rs. 130/- from a stranger to give to a friend. Should I have to pay the stranger Rs. 130/- back, or should my friend? It seems most appropriate for me to pay the Rs. 130/- because I’m responsible for the theft. Thus, the companies have to take the responsibility for paying damages.

Trade and its impact

Trade and its impact on the environment is one of the most important ethical issues not only because harming the environment often violates our right to non injury, but also because environmental damage has been incredibly harmful to both people and other animals. Not to mention that many environmental issues can create even more devastation in the future, such as the possible depletion of the world’s resources to future generations.

The importance of the environment not only shows traditional failures of business ethics of the past and the present, but it also helps clarify the importance of externalities and animals. Businesses, traditionally saw no need to pay for externalities, but we now know that externalities are of grave importance and are often a matter of life and death. Businesses traditionally saw no need to protect animals, but many moral philosophers no longer see any reason to value ourselves over other animals at any cost.

We think of the precious animals life and sit puzzled findings ways of saving animals. And it is high time we wake-up and our moral



responsibility to nature and to the future is of unprecedented importance and urgency that we cannot escape.

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LIBRARY AND INFORMATION SCIENCE EDUCATION IN INDIA IN DIGITAL ERA

Rekha Saha

Librarian

Seth Soorajmull Jalan Girls' College
8/9, Bankim Chatterjee Street
Kolkata

Abstract

The paper deals with Library and Information Science (LIS) education in India. It discusses the growth and development of the subject. Both the *traditional libraries and the digital libraries exist in India*. To provide guidelines for developing LIS education in the country and in designing the curricula University Grants Commission (UGC) has played a very important role. The universities and the professional associations also have an important role in the growth and development of the subject.

Regular LIS courses offered by different universities, specialized courses by NISCAIR (INSDOC), DRTC, NCSI, etc., distance LIS education by open universities and certificate course offered by BLA and some other organizations are also discussed here. The recent emphasis is given on e-learning in LIS education in India. The problems of LIS education in the Indian context are discussed. The recommendations of National Knowledge Commission (NKC) provide an opportunity to reform and changes in the development of LIS education in India.

Keywords Library and Information Science (LIS) education; Library Schools; Library professionals; Distance education

1. INTRODUCTION

Library and Information Science (LIS) education in India has completed 100 years in 2011. India has largest educational systems. At



the time of Independence there were only 20 universities and 500 colleges. India has 784 universities as on 2nd December 2016 and 37204 colleges as on 2014. To meet the growing demand for higher education, a number of distance education programmes are growing up in India. The growth and expansion of distance education programmes have generated e interest in student. Currently LIS education in India is passing through a turning point and has become a fast developing subject with a multidisciplinary approach. Today LIS education not only includes the library specific subject but also extended to subjects like computer application, statistics, information science, management studies and operation research. With the changing scenario modern librarianship has become a profession with a diversity of opportunities and challenges for LIS students and professionals.

2. OBJECTIVES

The objectives of LIS education have been revolutionized with the E Concept. LIS students are presently given more practical oriented Computer knowledge with extensive use of IT in libraries. LIS schools should think seriously in terms of the changing context. Students are given adequate knowledge of computers and communication technologies, networks and networking, operating Systems, Internet concepts, database management systems, along with adequate practical exposure to handle these technological devices.

Automation activities in Special, research, university and academic libraries have been increased. Most LIS professionals are using e-mails, CD-ROMs, LAN, and Machine Readable Catalogue for resource sharing. Lack of computer knowledge and use of computers are seen in the libraries in rural areas.

In India, libraries are switching themselves from the traditional type of services to online services and E-generated library services. The



situation is changing rapidly with the application of IT in the Libraries. Networking of computers has made this possible.

The main purpose of the LIS professionals is to provide relevant information to users at shortest possible time. The LIS professionals are concerned with the speed, cost and the reliability of information transfer.

3. LIS EDUCATION IN INDIA

LIS education in India started in 1911, Today nearly 100 Universities in India are running the LIS courses and imparting Certificate Course to MPhil and PhDs. Several universities are running Distance Education Programmes. UGC's initiative in providing adequate infrastructure to the LIS departments has enabled them to equip with IT laboratories. The National Accreditation and Assessment Council (NAAC) under UGC have provided good infrastructure, for both libraries and teaching departments. Several professional bodies, and the Academic Staff Colleges have organised large number of conferences, workshops and refresher courses. The IATLIS also organised a National Conference on the Study of the Infrastructure Facilities available in the LIS departments .

3.1. GROWTH IN LIS EDUCATION

Documentation Research and Training Centre (DRTC), Bangalore under Indian Statistical Institute in 1962 provided a specialised training programme in documentation. Indian National Scientific Documentation Centre (INSDOC), presently known as National Institute of Science Communication and Information Resources (NISCAIR), was established under Council of Scientific and Industrial Research (CSIR), Delhi, in 1957 started a course in Associateship in Documentation in 1964. It organised short-term training programmes for librarians and continuing education for LIS professionals. These two institutions are providing specialised training in documentation and



information . They have updated their curriculum regularly with the changing time.

A Review Committee for LIS education was setting up in the country in 1961 under the chairmanship of Ranganathan. The Committee gave recommendations that had impact on

LIS education. Some of these are:

- i. Have separate faculty for teaching ;
- ii. librarians acting as part-time faculty;
- iii. delineated separate objectives for BLIS and MLIS courses;
- iv. a student teacher ratio of 1:10 for BLIS and 1:5 for MLIS etc.

The formation of Indian Association of Teachers of Library and Information Science (IATLIS) in 1969 was another important happening . It organised its first seminar in 1970 on teaching methods in library science. University of Calcutta introduced two-years MLIS in 1974. Karnataka University, organised a seminar to discuss the changes in BLIS syllabi to accommodate components of documentation and information . University of Delhi organised a national seminar on development of curriculum in 1978. The University added another milestone when it introduced MPhil programme for the first time in the entire commonwealth region. The second PhD being awarded to Dr Pandey S.K.Sharma almost twenty years after the first PhD was awarded to Dr D.B. Krishna Rao.

Microcomputers appeared in library activities and services during the 1980s. Library schools began incorporating computers in the syllabi. University of Delhi was the first to introduce an optional paper on computer application. Two-years integrated MLIS in the North Eastern Hill University (NEHU) was introduced in 1986 and Madras University in 1988 A correspondence course at certificate level was introduced by M.L. Sukhadia University and Kashmir University . Punjabi University



started a diploma course. University of Madras initiated postgraduate courses. Andhra Pradesh Open University started a degree course in 1984. Indira Gandhi National Open University, New Delhi, introduced BLIS in 1989. It has played a pioneering role in LIS education, and conducts BLIS, MLIS, PhD and PGDLAN (one-year postgraduate diploma).

4. ROLE OF UGC, UNIVERSITIES AND PROFESSIONAL BODIES

The role of University Grants Commission (UGC) is very important in designing the curricula and in providing guidelines for developing LIS education in the country. The Ranganathan reports on University and College Libraries and Library Science Education were the first landmarks. Report of the Kaula Committee on Curriculum Development in LIS Education was published in 1992.

The impact of UGC Efforts:

- i. continuous development of the curriculum with changing times;
- ii. the UGC recognised LIS as a discipline as other pure and applied subjects;
- iii. growth of teaching departments in various universities;
- iv. necessitated the need for qualified personnel to teach the subjects

Introduction of LIS courses at the university level started in 1915 when Punjab University started a certificate course. Andhra University started a diploma course in library science, later upgraded as a postgraduate diploma in 1961. A postgraduate diploma course in librarianship was started by Madras University in 1938. Banaras Hindu University (BHU) was the second university to start a postgraduate diploma course in 1941 and started MLIS courses in 1965. In 1943 part-time evening course lead to Diploma in Librarianship started by



Bombay University. University of Calcutta started a one-year diploma course in 1945 and upgraded to BLIS in 1969. University of Delhi started the first postgraduate diploma course in 1947.

PhD programme was launched by the university in 1949. University of Delhi was the first to start a doctoral programme in library science.

The first PhD was awarded in 1957 to D.B. Krishna Rao from the University of Delhi. Library science courses were started in five more universities — Hyderabad, Osmania, Punjab, Poona and Rajasthan by the end of 1960. There were 12 library schools in 1960s.

The first school was set up by Andhra Desa Library Association in 1920. Madras Library Association (MALA) started a School of Library Science in 1929. The three main professional Associations are:

(i) Indian Library Association (ILA), (ii) Indian Association of Special Libraries and Information Centres (IASLIC), (iii) Indian Association of Teachers of Library and Information Science (IATLIS). The associations organised annual conferences at the national and international levels. The IATLIS with ILA and IASLIC organised jointly a National Seminar on 'Hundred years of Library Science Education and its Future' in October 1987. IATLIS and AGLIS organised jointly a National Seminar on 'IT and its Impact on LIS Education and Library Management' in 1996. Two unique courses were developed by the Documentation Research and Training Centre (DRTC) and the Indian National Science and Documentation Centre (INSDOC) to organize the needs of special libraries.

5. INDIAN LIS COURSES

W. A. Borden and A. D. Dickinson established the first training courses in library science in India at the central library, Baroda in 1911 and at Punjab University in 1915. Madras Library association and Bengal



library association started certificate courses in 1929 and 1935. Postgraduate courses started in other universities, such as -

- i. Andhra University (1935),
- ii. Banaras Hindu University (1941)
- iii. University of Delhi (1947).

University of Delhi was the first institution to start the M.Phil courses in 1977. LIS courses which are currently available in India are listed below:

- i. Certificate course in Library and Information Science (C.Lib.Sc)
- ii. Diploma in Library and Information Science
- iii. B.Lib.Sc. /BLIS (Bachelor Degree in Library and Information Science)
- iv. M.Lib.Sc. /MLIS (Master Degree in Library and Information Science)
- v. PGDLAN (Post Graduate Diploma in Library Automation and Networking)
- vi. M.Phil (Master of Philosophy) in Library and Information Science
- vii. Ph.D (Doctor of Philosophy) in Library and Information Science
- viii. D.Litt in Library and Information Science

6. DISTANCE EDUCATION

India has a good infrastructure of distance education programmes in LIS. Indira Gandhi National Open University (IGNOU) provides LIS facility exclusively. IGNOU offers Bachelors, Masters, and Postmasters degrees and doctoral programmes in LIS through distance education mode.



7. MODERNISATION IN LIS EDUCATION

In 1990s UNESCO gave the free software CDS/ISIS to libraries. It provided expertise for training. It also provided International experts trained resource persons in the country. The decade gave birth to library and information networks such as INFLIBNET, DELNET, CALIBNET, etc. in India to overcome the increasing resource crunch. The developments in telecommunication technology were also slowly incorporated in the curriculum. International School of Information Management (ISIM) was established to offer MTech and PhD degrees in information systems and management.

National Knowledge Commission (NKC), Government of India has recommended certain measures for development of LIS education in India. These are:

- i. National Mission on Libraries should be set up for a period of three years.
- ii. Modernise LIS education, training and research facilities.
- iii. To keep the LIS sector enriched of latest developments,
- iv. To establish a well-equipped institute for advanced training and research in library and information
Science
- v. To establish cooperation between the teaching/research faculty and practicing librarians at all academic and research institutions.
- vi. There should a student teacher ratio of 1:10 for BLIS and 1:5 for MLIS etc.
- vii. All departments of LIS should have computer centres and well-equipped departmental libraries



viii. Appropriate physical facilities must be made available to each LIS Department.

ix. E-learning materials should be provided.

8. PROBLEMS OF LIS EDUCATION

There are several problems of LIS education, such as :

- i. Insufficient infrastructure facility
- ii. Inadequate trained manpower.
- iii. Restriction for the usage of regional languages for studying LIS course.
- iv. Stress on teaching of customary aspects by not giving enough scope for IT and practical aspects of library automation.
- v. Non- introduction of students to LIS before they join the course.
- vi. Lack of coordination and cooperation between library and department of LIS.
- vii. Lack of training facility of LIS schools
- viii. Lack of economic resources
- ix. Lack of supporting strategy
- x. Lack of standardization
- xi. No solid effort to establish a mechanism for certification of LIS Course

9. CONCLUSION

Libraries hold a special position in the development of a society. LIS education system in India indicates that the quality improvement is essential and unavoidable, not only for its survival but also for facing the major changes and challenges. The use of information technology for training LIS students and professionals has become vital for



meeting the challenges. The importance of the role of library schools to train manpower for coming decades can be a factor to the progress of the nation. India can be considered as a feasible partner in reshaping LIS education in developing countries. Librarians and teachers should come together to defeat all shortcomings and take LIS education to greater heights.

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HUMAN RIGHTS EDUCATION HISTORY

G. Sambaiah

P.B.N.College, Nidubrolu
Guntur, Andhra Pradesh

The emphasis on Human Rights Education began in 1995 with the beginning of the UN Decade for Human Rights Education, though previously addressed in 1953 with the UNESCO Associated Schools Program, which served as an “initial attempt to teach human rights in formal school settings”. The first formal request for the need to educate students about human rights came about in UNESCO’s 1974 article Recommendation concerning Education for International Understanding, Cooperation and Peace, and Education Relating to Human Rights and Fundamental Freedoms.

The participants of the International Congress on the Teaching of Humans Rights eventually met in 1978 to form a specific definition of what would be required application of the education in formal curricula. The aims at which the Congress agreed upon including the encouragement of tolerant attitudes with focus on respect, providing knowledge of human rights in the context of national and international dimensions as well as their implementations, and finally developing awareness of human rights translating into reality whether social or political on national and international levels.

Human Rights Education became an official central concern internationally after the World Conference on Human Rights in 1993. This conference brought the issue of educating formally to the top of many countries’ priority lists and was brought to the attention of the United Nations. It was two years later that the United Nations approved the Decade for Human Rights Education, which reformed the aims of application once again. Since the development of the UN



Decade, the incorporation of human rights education into formal school curricula has been developed and diversified with the assistance of nongovernmental organizations, intergovernmental organizations, and individuals dedicated to spreading the topic through formal education.

Today the most influential document used to determine what qualifies as human rights and how to implement these ideas and rights into everyday life is the Universal Declaration. This declaration was adopted by the General Assembly in 1948, making December 10 annual Human Rights Day ever since. To this day the 30 article compilation is seen as “a common standard of achievement for all peoples and all nations”.

HUMAN RIGHTS EDUCATION MODELS

1. Values and awareness The Values and Awareness Model focuses on transmitting “basic knowledge of human rights issues and to foster its integration into public values” based on its philosophical-historical approach. This model is what people commonly think of when human rights are concerned with the target audience being the general public with topics including global human rights and more cultural based matters.

2. Accountability the Accountability Model is associated with the legal and political approach to human rights in which the learners which the model targets are already involved via professional roles. The model is incorporated by means of training and networking, covering topics such as court cases, codes of ethics, and how to deal with the media.

3. Transformational This model of education focuses on the psychological and sociological aspects of human rights. The topics towards which this model is effective are those including vulnerable populations and people with personal experiences affected by the topic, such as women and minorities. The model aims to empower the individual, such as those victims of abuse and trauma. The model is



geared towards recognizing the abuse of human rights but is also committed to preventing these abuses.

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A REVIEW STUDY OF CHARACTERISTICS MATERIALS FOR MICRO DEVICES

E. Sanjay Kumar

Lecturer in Physics

S.V. Arts, Commerce & Science College

Chagalamarri, Kurnool (Dist)

Abstract

The characteristics of materials like ferrites, garnets, ferroelectrics, relaxor ferroelectrics, temperature compensated dielectrics and copper coated PTFE based composited which are used extensively in microwave devices are discussed.

Keywords: Microwaves, ferrites, garnets, ferroelectrics, relaxor ferroelectrics, dielectric resonators and metalized PTFE.

The transmission lines for the guided propagation of electromagnetic waves in the microwave frequency range (1GHz to 100 GHz) are waveguides and microwave integrated circuits (MIC). The waveguide components/devices are bulky and expensive but can carry high power whereas MICs show their versatility in low power, lightweight, miniaturized microwave systems. The development of this wave-guide based components and MICs depends upon the availability of materials with specific characteristics. Hence the physicochemical properties of such materials have an impact on microwave technology. In this paper, a few sets of such microwave materials and their characteristics which make them suitable for microwave devices are described.

Microwave Materials and Characteristics

The primary requirements of microwave materials are also dc conductivity, low dielectric and magnetic losses, and temperature independent dielectric or magnetic properties. Some of the materials that satisfy these requirements are ferrites, garnets, ferroelectrics and



temperature compensated dielectrics which are ceramic materials and copper clad composites based on PTFE which are used as substrates for MICs.

Ferrites and Garnets

Spine, ferrites are a class of magnetic materials which a general formula MFe_2O_4 (M being a divalent metal). M can be replaced with divalent metals with the chemical formula $M_{1-x}M_xFe_2O_4$. The parameter x varies from 0 to 1, thus changing the physical parameters as per device requirements. M can also be replaced with monovalent and trivalent metals and lithium and lithium zinc ferrites belong to such a family (Baba et al., 1971). Garnets are another class materials with the cations being rare earths and iron. An example of such a family of compounds is yttrium iron garnet ($Y_3Fe_5O_{12}$). One can prepare garnets and ferrite powder materials using conventional ceramic methods and this is most widely used by industrial organizations.

A comparison of ferrite and garnet compounds is given in Table 1. Various techniques are currently employed in characterizing these materials at microwave frequency. However, the most reliable method cavity perturbation technique has been used for the microwave characterizing of these materials and the details are given by Muthy and Raman (1989). The specifications of the ferrite material for isolator attenuator application are given table 2 and some characteristics of lithium ferrite for such devices are given in table 3.

Ferroelectrics

Ferroelectrics are electrical analogues of ferromagnets displaying Curie-Weiss law in their dielectric constant variation with Temperature (Lines and glass 1977) for microwave applications they are used above the Curie temperature (T_c) that is, in the paraelectric region because these materials don't exhibit their characteristic hysteresis, piezoelectric and pyroelectric effects in the paraelectric state but still



exhibit large electric constant which depends on voltage and temperature with a lower dielectric loss. Majority of the applications utilizing ferroelectrics depend on their large non-linearity in dielectric constant at a particular temperature above T_c either under dc bias or under varying field strength of the microwave power (Horton and Donaldson 1967). A ferroelectric whose T_c is below room temperature, having low dielectric loss at room temperature, exhibiting large non-linearity in dielectric constant above T_c but depends on temperature only sluggishly is ideal for microwave applications. Materials like $BaTiO_3$, $SrTiO_3$, $(Pb_x Sr_{1-x})TiO_3$ with $x=0.315, 0.35$ & 0.45 , $(Ba_{0.75}Sr_{0.25})TiO_3$ are used widely in microwave applications. All of them crystallize in perovskite structure with T_c below 393 K. They are used in the ceramic form and have resistivities of the order of 10^{11} to 10^{13} ohm met.

Under the applications of a dc bias voltage both the dielectric constant and loss of a ferroelectric will decrease. The non-linear dielectric properties enable them to be used in microwave filters, limiters, phase shifters, switches, mixers and modulators and as the active element for microwave parametric amplifier/oscillators, harmonic generators and electromagnetic shock wave generators.

The advent of ferroelectric thin films will help this field as it will decrease the amount of dc voltage required to bring in enough change in the dielectric constant (Das, 1967). Ferroelectrics generally have relaxation in or around the microwave region. They can be used only at frequencies far away from the relaxation region. Ferroelectrics are characterized using coaxial cavities at smaller microwave frequencies and by a transmission technique at higher frequencies. However, a dearth of the data exists about the large signal microwave dielectric properties of ferroelectrics. Table 4 contains the data of a few ferroelectrics which are used in microwave applications. Unless



otherwise specified the materials given in this table employed in ceramic form (Das 1964)

Relaxor ferroelectrics

Another class of materials, which shows novel properties to that of its ferroelectric counterpart, is relaxor ferroelectrics. These materials are often identified by its frequency dependent diffuse phase transition. Unlike ferroelectric materials, the relaxor ferroelectrics do not possess well defined domains below T_c and also does not exhibit optical anisotropy. Several investigations have been in progress to understand the diffused nature of the phase transition in this material. Many relaxation models have been proposed to date to explain the phenomenon. $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3$ was the first material reported to be relaxor ferroelectrics and very well studied on technical as well as scientifically for its large dielectrics constant near the room temperature (Smlenskii, 1958)

In this material the disordered nature of Mg and Nb ions is considered to be instrumental in producing local field fluctuation, which ultimately diffused the phase transition. Relaxor ferroelectrics are widely used as multilayer capacitors, piezoelectric actuators and transducers. The composition $0.9\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3-0.1\text{PbTiO}_3$ is widely used as pyroelectric detector for its large pyroelectric coefficient near T_c (Uchino K, 1986)

Materials for dielectric resonators

Dielectric resonators are used in MICs for frequency control. They are just a ceramic pellet in the form of a parallelepiped or cylindrical disc (Fiedziszko 1986). When a continuous band of microwave is passed through a dielectric resonator, it will resonate at a few discrete frequencies determined by the geometry and dimensions of the pellet. Since the electromagnetic field can satisfy the boundary conditions in more than one mode, one will get a series of modes each



having different field pattern. The most widely used mode is TE_{011} mode. The material used for making dielectric resonators should satisfy the following conditions (Subba Rao et al., 1990)

- (a) The dielectric constant should be high (generally 10 to 100)
- (b) The dielectric loss should be low ($\tan \delta = 0.0003$)
- (c) The temperature coefficient of resonant frequency τ_f must be very small (τ_f must be less than ± 50 ppm).

A large ϵ will aid the miniaturization while a low dielectric loss will result in a high Q value. But the value of τ_f depends on both the temperature coefficient of dielectric constant (t_ϵ) and coefficient of thermal expansion (α) since $\tau_f = -(t_\epsilon/2 + \alpha)$

Materials with compensating t_ϵ and a given low value of τ_f . τ_f depends only on the lattice dynamics of the material while t_ϵ can be controlled through heat treatments. The materials should not have any relaxation near the frequency range of interest. The materials which are widely used as DR have perovskite or perovskite related structures. But the role of secondary phases in DR materials is considerable. They help sintering as well as in enhancing the desirable properties.

Dielectric resonators are used in various types of filters and oscillators and as miniature radiating elements in microwave integrated circuits. Coupling to DR is easy and can replace bulky cavity resonators in many applications. These temperature compensated dielectrics are characterized in the microwave frequency range using a method popularly known as Courtney's method (Courtney 1970).

Characteristics of some representative temperature compensated dielectrics are given in Table 5 (Nomura 1983; Wakino et al, 1984).



Copper coated PTFE (polytetrafluoroethylene)

Metalized fluorocarbon polymers (PTFE) with woven or nonwoven glass fiber and with high dielectric constant ceramic fillers offer combinations of properties suitable for applications like microwave antenna (Traut, 1980) and microwave integrated circuits (Olyphant and Ball, 1970). For these microwave applications the microwave substrate chosen should meet certain exacting demands like uniform dielectric constant, controlled thickness and low loss (Woenbkem 1979). The copper coated PTFE substrate is most commonly used for this purpose. The substrate was conditioned in sodium hydrozide, acetone and water mixture. The preconditioned substrates were subsequently pretreated with stannous chloride sensitizer and palladium chloride activator. The copper coating was achieved by electroless method using a copper bath. Electroplating of copper should be resorted to for further increase in the thickness if required. One can use electroless method to deposit copper for good adhesion, uniformity smoothness. This approach is least expensive and reliable. The characteristics of copper coated PTFE for microwave devices are that the dielectric constant is around 2.2 and dissipation factor is 0.0001.

Dielectric relaxation in organic liquids and its mixtures

In liquids the molecules has the rotational freedom and its dispersion occurs at microwave frequencies. So studying the dielectric properties at microwave frequencies will reveal the dielectric relaxation of polar molecule and its variation with respect to the interaction with neighboring polar as well as non polar molecules. The effect of hydrogen bonding on the dielectric relaxation can also be studied at microwave frequencies(V.R.K. Murthy, 1979).

Conclusions

Considering the strategic role enjoyed by the microwave technology in aerospace and communications, the demand for materials with more



specific characteristics will be increasing, especially for miniaturized microwave systems. Ferroelectric thin films can get a renewed interest. Temperature compensated dielectrics can be used as MIC substrates also. Properties of high temperature superconductors are being exploited for various microwave applications. Materials with low loss and high ϵ are required for developing MICs in the lower microwave frequencies. Overcrowding of microwave frequencies and the special characteristics of millimeter wave force more and more systems to operate in the millimeter range, which requires materials with low dielectric constant and low loss at that high frequencies.

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DEFLOURATION OF WATER BY ADSORPTION ON FLY ASH

M.M.V.Y.Swamy

Lecturer in Chemistry
K V R College, Nadigama
Krishna, Andhra Pradesh

Abstract

In order to improve the durability of fly ash concrete, a series of experimental studies are carried out, where durability improving admixture is used to reduce drying shrinkage and improve freezing-thawing resistance. The effects of durability improving admixture, air content, water-binder ratio, and fly ash replacement ratio on the performance of fly ash concrete are discussed in this paper. The results show that by using durability improving admixture in nonair-entraining fly ash concrete, the compressive strength of fly ash concrete can be improved by 10%–20%, and the drying shrinkage is reduced by 60%. Carbonation resistance of concrete is roughly proportional to water-cement ratio regardless of water-binder ratio and fly ash replacement ratio. For the specimens cured in air for 2 weeks, the freezing-thawing resistance is improved. In addition, by making use of durability improving admixture, it is easier to control the air content and make fly ash concrete into nonair-entraining one. The quality of fly ash concrete is thereby optimized.

1. Introduction

Coal is widely used in China as fuel for power plants because of its dependability and economy. In 2009, more than 375 million tons of fly ash was generated from coal-fired power plants in China. How to effectively use fly ash is still a major social problem. In order to construct recycling society, researchers have found many ways to make efficient use of fly ash in civil engineering field [1–10], but in fact the



use of fly ash in building construction is still limited. The main reasons are as follows. The quality of fly ash is unstable because the quality of fly ash changes greatly with that of coals [11, 12]; there is lower early age compressive strength of concrete due to lower activity of fly ash [13, 14]; (3) pozzolanic reaction of fly ash leads to decreased pH value of concrete, which results in a poor carbonation resistance [15–17]. In addition, in order to ensure the resistance of freezing-thawing action, it is necessary to entrain a certain amount of air in the concrete. However, air-entraining admixture is adsorbed by the unburned activated carbon in fly ash which reduces air-entraining capability of fly ash concrete [18, 19]. Therefore, it is the key issue to keep serial and stable air in fly ash concrete. In other words, the air content control of fly ash concrete is difficult.

On the basis of the above mentioned background, this paper focused on the nonair-entraining concrete. The effects of durability improving admixture, air content, water-binder ratio, and fly ash replacement ratio on strength development, drying shrinkage, carbonation, and freezing-thawing resistance of fly ash concrete are to be investigated.

Materials Used and Concrete Composition

The characteristics of materials used and the properties of fly ash used are shown in Tables 1 and 2. Table 3 shows the experiment factors and ratios. shows the interpretation of marks. The mixture proportion and properties of concrete are shown in Table 4

Table 1: Characteristics of materials used.

Cement	Ordinary Portland cement Density: 3.16 g/cm^3 ; specific surface area: $3280 \text{ cm}^2/\text{g}$
Binder	Fly ash
Fine	Mountain sand Density in oven-dried condition: 2.56 g/cm^3 ; water absorption: 1.72%; fineness modulus:



aggregate	2.67
Coarse aggregate	Crushed stone Density in oven-dried condition: 2.64 g/cm ³ ; water absorption: 0.81%; maximum size: 20 mm
Admixture	Air-entraining and water reducing admixture Air-entraining admixture for fly ash: nonionic surface active agent Durability improving admixture: glycol ether derivative (nonwater solution)

Table 2: Properties of fly ash used.

Ignition loss [%]	Density [g/cm ³]	Blaine's value [cm ² /g]	MB absorption [mg/g]
1.4	2.24	4160	0.51

Table 3: Experiment factors and ratios.

Fly ash replacement ratio	0%; 15%; 25%
Water-binder ratio	60%; 50%; 43%

4. Conclusions

The following conclusions were drawn from the work presented above on the effects of durability improving admixture, air content, water-binder ratio, and fly ash replacement ratio on fly ash concrete properties. (1) By using durability improving admixture in nonair-entraining fly ash concrete, the compressive strength of fly ash concrete can be improved by 10%–20%, and its initial compressive strength



improved also.(2)Irrespective of the presence of air, durability improving admixture, or fly ash replacement ratio, both tensile strength and modulus of elasticity are dependent on compressive strength.(3)By using durability improving admixture in fly ash concrete, the drying shrinkage is reduced by 60%.(4)Carbonation resistance of concrete is roughly proportional to water-cement ratio regardless of water-binder ratio and fly ash replacement ratio. The ratio of carbonation velocity coefficient of fly ash concrete is $ST : PL : D = 1.0 : 0.7 : 0.6$. Also, carbonation acceleration experiment of concrete with more than 15% fly ash replacement ratio depends on the carbonation depth at the start.(5)By using durability improving admixture for 2 weeks of curing in air (drying process), the freezing-thawing resistance can be improved even in nonair-entraining concrete.

By making use of durability improving admixture, it is easier to control the air content and make fly ash concrete into nonair-entraining one. The quality of fly ash concrete is thereby optimized. In the field of application fly ash concrete, the use of nonair-entraining mode and durability improving admixture is a valuable option.

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METHODS OF TEACHING ENGLISH: AN OVERVIEW

Smt.Y.Supriya
Lecturer in English
S.V.R.M. College
Nagaram, Guntur

Smt.LMR Swarupa Rani
Lecturer in English
S C S Kalasala
Gudlavalleru, Krishna

Of all the factors that contribute to the rapid progress of the nation, education is undoubtedly a vital one. Only quality education can play such a role. The quality of education is enhanced through effective teaching which will enable students to gain knowledge in a very congenial environment as independent learners and reach greater heights in life. (Muijus and Reynolds, 2005) For effective teaching, a teacher has to adopt an appropriate method choosing from varied options. This choice is made on the basis of the students' background, knowledge, learning ability, and environment and learning goals. Teachers also consider while deciding upon the suitable teaching method the students' different ways of learning, different styles of receiving things and exhibiting them. They always choose those techniques which suit those varied learning styles in order to enable the students to get information and improve comprehension. The different methods and techniques employed will ascertain that all the students with different learning styles will be provided equal opportunities to learn.

NEED of the Hour-

The teaching of English as a Foreign Language is on great increase in the world today. English language teachers in non-English-speaking countries have realized through experience that the only use of either traditional or modern methodology will not serve the purpose of teaching English as the second language. Teachers have also made a finding that traditional as well as modern methods only can help the students to master the form, the use, and the content of the target



language. Harvey (1985) states: "What might be called traditional methods and skills are not necessarily unworkable alongside modern EFL teaching methods. The idea that the two are mutually exclusive is absurd." Thus this paper is intended to investigate empirically through the relentless search of a second language teacher who compares, analyzes, evaluates and examines the ancient and modern methods in order to explore and evolve a more convenient and effective method for motivating the second language learners to use English for communication purposes. Since the aim of any methodology in foreign language teaching is to improve the foreign language ability of the student, the second language teacher is supposed to be resourceful enough to make a good analysis of different methods and approaches in order to proceed with a wise choice of an appropriate method for any specific teaching item. He or she cannot follow any one particular method for every teaching item but seek a suitable method either ancient or modern to achieve the desired result. Every class will be an experiment if the second language teacher evaluates and chooses a suitable method.

METHOD of Choice-

Of the three primary second language teaching methods: the Direct Method, the Grammar-Translation Method, and the Audio-Lingual Method, it is difficult to decide which is the most predominant because each has its own strengths and weaknesses, and the student's goals and abilities will determine which is the best for that student. The Direct Method also known as the Oral or Natural method encourages the active involvement of the student in both speaking and listening in the new language in everyday situations. The learner is trained to think in the target language rather than to translate. He or she hears and uses the language before writing in it. This process consists of a gradual acquisition of grammatical structure and vocabulary. The traditional method of teaching Latin and Greek led to



the development of The Grammar-Translation Method. This method focuses on the written language using translation exercises, reading comprehension and imitation of texts. Learning is meant for the mastery of grammatical rules and memorization of vocabulary lists. Audio-Lingual Method is the self-teaching method and it is also known as the Aural-Oral method. The learning is based on repetition of dialogues and phrases about everyday situations. When the expressions are imitated, repeated, and drilled to make the response automatic. Reading and writing come later only as reinforcements of what the learner practices.

The Direct Method helps the student to develop the ability to communicate quickly because she is encouraged to practice and create responses in the target language during practice. It enables the learner to understand what another person says and eventually develops the capability to speak. This is the suitable method for instruction with a live trainer and also where speaking and listening are most important. The Grammar-Translation method requires the learner to spend a lot of time understanding the language structure which is helpful in reading and particularly in writing. Listening and speaking will thus be neglected where as grammar and vocabulary are emphasized throughout. When the student's goal is to achieve a high level of writing and reading ability in a foreign language, versus speaking and listening, grammar translation method is the best method to adopt. Though the Audio-Lingual Method also makes the learner to communicate quickly, that is possible within the limited range as the repetition allows. It is useful to improve comprehension only and also when the speaker uses phrases that the learner has studied. Even reading is limited, and an understanding of how to use the language is very limited. This method can be opted for self-made study when a live trainer is not available.



Traditional Teaching Methodology-

As Traditional approach to the teaching of the target language regards the language as a body of grammatical rules and an unlimited number of words that are combined according to the rules, the teacher has to spend a lot of time explaining them to the Students and thus enable the second language learners to use the language. It is thus teacher- centered and teachers serve as rich source of knowledge. The teacher's explanation, mostly translations as practice is followed by exercises, revision and assignment. It is believed that under the supervision and able guidance of the teachers, second language learners can build a large repertoire of words, sentences and grammatical patterns and produce them accurately and quickly in the appropriate situation. Even as passive receivers, second language learners derive great motivation from the teachers in that challenging task of developing skills and areas of knowledge of the foreign language separately.

The way of thinking and living of people of an area, their ideas of education, their learning styles and habits shown in the acquisition of a language will be reflected in the teaching methodology adopted especially for the teaching of the second language. It will enable them to learn the structures of the language and to get the knowledge of the language rather than language skills. Hence in the teaching of English language when adequate and proper explanation of grammar along with limited translation from or to the target language become an essential part of second language teaching, students would get acquainted with the sentence structures through vocabulary and sentence pattern exercises and get proficiency in the target language.

In traditional teaching methodology, no attention is paid to the teaching of the basic language skills except writing skill since it regards the written language as the highest priority in learning a foreign language. If one can write in a foreign language, he or she is considered



to have reached the goal. As students can explore only narrow avenues of the language and the syllabuses are mostly grammatical, traditional language teaching has been used very often in schools world-wide and is still the predominant classroom method. The traditional methodology lays the responsibility for teaching and learning mainly on the foreign language teacher and it is believed that if students are present in the lesson and listen to the teacher's explanation and examples, they will be able to use the language. Vocabulary lists, grammar rules, and sample sentences are provided for the students for practice. Students are expected to practice sentences and create the correct patterns after grammar rules are explained to them. Besides they receive the long lists of vocabulary. There is no oral or pronunciation work, since the written language is taught first, and 'familiarizing with the target language' is focused rather than any ability to use the language.

Grammar Translation Method-Economic and Effective:

The grammar translation method employed techniques that included memorization of dialogues, question and answer practice, drilling exercises and different types of speaking and writing exercises. It produced habits of converting vocabulary items and grammatical forms first into the mother tongue and only then is the meaning formed and expressed in the target language. Doing a little bit of translation in students' native language is both economic and effective in explaining a concept. Classes taught in students' native language is a good way of saving the valuable time of the students. Briefly the translation of sentences from or to mother tongue and communicating in the students' own language reveals the students' reception and comprehension.

The teacher should make the students aware of fundamental conceptual differences in the two languages and help them understand the concepts in English properly. If an error still occurs, the teacher is advised to correct it as soon as possible. Though the learners



learn by making mistakes, the practice of using the wrong things will cultivate improper habits. Good habits are formed by having students produce correct sentences and not through making mistakes. The second language learner's possibility of making mistakes are to be either reduced or completely avoided through conditioned chances for producing utterances in written or spoken form like doing drills and reproducing dialogues. From the beginning, students are encouraged to get mastery over the target language through accuracy before the practice of making mistakes becomes the part of the learner's speech. Teachers will correct the mistakes of the students immediately when noticed and make the students forget those mistakes. Routines should be broken in no circumstances. The typical procedures are described and the teacher starts with the revision of the previous lesson. The teacher with the supervision of every student individually involve them in teaching and learning through doing exercises, taking tests, responding to the questions etc. The teacher explains a new topic and practices it with exercises. He sums up the topic and sets assignments for the next lesson.

The limited use of translation from and to the target language is the essential part of second language teaching. The sentence structures of the target language will become familiar to the student through the vocabulary work and pattern drills which will ultimately result in competence of the second language learner. Grammar and pattern drills are to be taught with relevance to meaning and use. If it is done in contexts, students will be aware of the basic principles of appropriateness. But this traditional methodology used for teaching English as a foreign language serves partially the purpose of teaching English for communicative purpose as students should get familiar with the usage of language rather than knowledge. They would get linguistic competence if the contexts and knowledge of the target language are made as realistic as possible. Apart from the elaborate



explanations of the rules of grammar, the teacher has to show the appropriate real life situations to the students in which they are motivated to use the language. When different types of verbs- transitive and intransitive are described, examples are to be given to show how intransitive and transitive verbs can also be interchangeable from real life situations as

1. Birds are flying high.
2. The boy is flying kites.

Both accuracy and fluency are equally important in language learning but accuracy is made more significant than fluency in grammar-translation method. As linguistic details are focused in such class rooms, students are very much satisfied their language productions and correct answers. They are particular about exact words, grammar points and sentence patterns. The relationship and preference between accuracy and fluency will be decided on the basis of teaching conditions and the requirements.

Communicative Approach-

Today there is a great demand for those who can use English for communication purposes accurately and fluently. Unless there is basic knowledge of English, accuracy is not possible. Besides, accuracy is built on the habit of using correct expressions fluently. This should be done only in the classroom as students have little exposure for getting acceptable form of English outside the class room. With rigorous practice in language classes, students are expected to get accuracy. When students are encouraged to use the language spontaneously and fluently, they will get acquainted with the language system.

Once the students have mastered the language, form and accuracy, they will be given intensive fluency practice. Instead of controlled and semi-controlled exercises, students should be guided to



use language freely even with errors. Teachers will never consider their errors while assessing their fluency practice as error making is natural and common but not disgraceful. Students are thus aware of their weaknesses and they will try to avoid their errors. Thus accuracy and fluency are equally balanced and maintained simultaneously.

The mastery over the form of the language along with the ability to use it for communication are interdependent and one without another is of use. At the beginning, the mastery over the language the language system i.e. linguistic competence is developed with the spontaneous, flexible, and correct manipulation of principles of the target language which acts as the basis of communicative competence. The learner's readiness to use suitable techniques in order to conduct oneself in certain language situations will result in ability to communicate in the target language. After grammar, form and knowledge are imparted through traditional teaching, communicative competence will develop from such linguistic competence. Different types of classroom activities like role play, simulation, and interaction in real-life situations will develop communicative competence along with linguistic competence.

The second language teachers should arrange for the constant practice for the learners through class room interactions and activities which will facilitate their learning. The teacher as the facilitator will involve all the students in the communicative process among the students and monitor it giving various tasks and guidance through advice. The teacher is no more the leader of the class but students themselves become leaders on their own in communicative process. Teacher's intervention is completely avoided. Instead teachers become independent participants in the teaching-learning group and encourage students to take part in the communication process spontaneously. The teacher observes the learning process keenly by giving directions to the students to come out with their abilities. Han pointed out that the



teacher had to recognise the distinctive qualities of the students and help them develop them to a great extent.

The teacher's role in contemporary English language teaching changed over the years but it is still important as a communicative activator. He or she will act as the source of resources along with the role of guide and manager of activities. The main and important role as a researcher and learner will contribute much to the existing knowledge, abilities and experience.

EFL teaching with its traditional setting, is markedly different in different social and cultural contexts. Communicative approach can be applicable in any context. To make this approach work well, it must be reconciled with the traditional method like grammar-translation method.

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ROLE OF SANSKRIT IN PRESERVATION OF WILD LIFE BIO - DIVERSITY AND ENVIRONMENT

Dr. T.Venkateswarlu

Lecturer in Sanskrit
S.V.A.C. & Science College
Chagalamarri
Kurnool (Dt.), Andhra Pradesh

Sanskrit literature reveals that our ancestors never looked upon forests and Environment, as just a cluster of trees, but they deemed it as a total Biological live landscape. Starting from atom – molecule – cell – community of plants and organisms, they were also aware of the umbilical links to land, water, oceans, atmosphere, stratosphere, hydrosphere, lithosphere, which are intimately linked and interdependent.

They also revealed that nature, works with several gears, springs, wheels within wheels in a unified fashion with perfection, built in with self repairing and healing power.

Eminent scientist like Einstein strongly believed in nature's inherent harmony. This concern throughout was to find a unified foundation of physics. According to our seers and sages as well as Einstein's observations were that "nature is like a vibrating veena" with perfect rhythm with live waves. They were also aware of the vital functions of non – living entities and speed etc.

The non – living entities are life supporting resources and they perform their functions with precisions or else there will be devastating effect. Similarly micro – organisms to largest terrestrial and aquatic mammals and plants retain and maintain razor sharp organizations. They also acquire required quantity of air, water, energy (Caitanya) from nature without any kind of distortion and disturbance and they never abuse these precious orchestrated unit of life.



The highlighted importance of plants, trees and their distribution to maintain the climate, rainfall and ambient temperature, are vital for the life to exist in the planet. They were also aware of the importance of holistic concept of nature and never meddled casually.

These understandings have laid a strong foundation to acquire a Divine personality. This was further laid to understand the cosmic, empirical, and social integration of nature with human soul. According to them these are inseparable and function in harmony that man is a miniscule part of universe. They have to put in suitable words that he is in all, and all are in him and no one can isolate and survive in isolation from the environment.

The concept of universe:

1. Adhibhuta (Physical ecological components of nature and they will provide an environment to the life).
2. Adhyatma (Which creates an organic life on the earth to perform defined functions within the framework of nature).
3. Adhidaiva (The divine ecological components such as oxygen prana vayu i.e., flame of the life, water is an elixir of life i.e., jeeva jala and bio-diversity assemblage which supplies food needs to the living organisms because they are the primary food producers).

These assemblages of communities of plants and animals communication with suitable forces instinctively and adhere to in areas of (1) person to divinity, (2) person to soil, (3) person to air, (4) person to water, (5) person to assemblage of bio-diversity, (6) person to person.

Atharva veda deals with the man living in the rich varied bio-diversity. The fellowship of man and nature is the central theme of Atharva Veda. The spirit of Atharva Veda illustrated in the Prudthvi Sukta i.e.

1. The trees and plants firmly stand on your,



2. The sea, the rivers and water reservoirs are found in you,
3. The animals roam on you and birds fly over you,
4. The hills and mountains are richly decorated,
5. The fragrant breeze moves on you,

Oh – Mother, I am your child. This sukta is not mere emotional attachment, but it speaks of inseparable umbilical links to survive and it highlights all benefits we derive from Her.

It is needless to emphasize that life system on this planet are well designed for self sufficiency and it always prospers, nourishes and flourishes.

They were aware of the modern theory of entropy i.e. every time energy changes hands and envelops as a life unit and locks up in the universe. (Entropy is measure of unavailability of systems of thermal energy for conversion, into mechanical and biological works.

But intensive and extensive human activities are enhancing this entropic doom or heading for a planetary suicide.

Sanskrit literature did recognize all living creatures and also aware of their perfect chemical mixes for designed entropy which operates within the species as well as among the communities.

Kautily's Arthashastra written between 321 B.C. – 300 B.C. emphasizes about forest policy – legislation – importance of conservation – and management aspects. This shastra also highlights the harvest technology for animals and plants and provides comprehensive management guidelines depending on animal, social and sexual behavior. They also mention the breeding season and their cosmic links to the planets to different animals and plants.

Agama shastra clearly enunciates the mandatory guidelines to manage and protect forest wealth.



Vrksa Ayurveda, Gaja Ayurveda, Ashwa Ayurveda etc., will speak about the scientific management aspects of contemporary modern sciences like biotechnology, and genetic engineering were practiced by inducing and also to bear fruits and floweres even during off-season and to increase the aroma and flavor the size and to change the colour of flower and fruit and above all to develop permanent resistance for pests and deceases. Their main goal was to maintain the health of the soil and provide appropriate micro-macro nutrients in assumable form to the plants as well as to nurture micro flora and fauna.

In Yagnavedi: They elaborately explain do's and dont's while exploiting the biological resources. They had amazing scientific insight of biological functions and also they were very clear in their approach to maintain the ecological integrity.

Similarly, Dharusangraha: They explained the mathodologies of utilizing the living resources in a scientific manner, strictly prohibiting certain acts and with a clear mandate to exploit resources sustainably without disturbing the ecosystem. For example, (1) They totally prohibited the exploitations of dead and fallen trees because they will provide food and shelter to varities of organisms and niche for breeding, because of adequate food security and they provide protection to harbor inside to save their offsprings from predators.

While degradation of the deadwood, it creates a food web and sustains wide range of living creatures. While degrading this complex chemical substances like lignin it enriches the oxygen to the soil profiles and supplies adequate oxygen to the anaerobic living organisms. Thus life process sets in, by degradation and decomposition and builds up biological and ecological capitals.

Sangraha Vedi: They highlight the harvest technology without hurting the organisms e.g. while plucking tulasi leaves, nail should not come into contact with tulsi leaves there should be no metallic contact.



Similarly, the sacred plants i.e. Dhavana (Artemisia) and Maraga (Orienum) etc., of the Aromatic plant species offered in rituals to Deities whenever they use such aromatic plants are used for pujas and rituals, it was a usual practice to plant double or there times the requirement. This clearly reveals the concern for conservation of such valuable plants.

Our Ancestors were also aware that these plants play invaluable role in Aroma therapy for example in satyanaraynaa vrata, 24 leaves and 24flowers offered in the ritual, provided essential volatile oi's for the participants. This clearly indicates that for various rituals, they have recommended a set of leaves and flowers and the season i.e. when the active principles are rich, the users get maximum benefit by offering the recommended set of flowers and leaves. In the contemporary world, the scientists are recommending alternate methods of treating various ailments. Aroma therapy in one of the recommended system to treat various ailments, especially psychometric disorders, nerves' disorder and physical / mental stresses etc.

Puspa Ancayavedi

There is code of conduct to be adhered to, while harvesting flowers which are scientific and meaningful, to safeguard the future generation of the species by safeguarding the seed setting and also to prevent biological stress to the plant e.g. 1) They insisted to harvest only just bloomed flowers i.e. before fertilization. After fertilization it is almost like a pregnant creature so they prohibited collection of flowers after fertilization. (2) Collection of flowers in the evening was prohibited. (3) they also prohibited collection of long lasting flowers, because it will be a rich source of fool and nectar to insects, birds, ants and especially to bees. The most outstanding example is ficus species. The ficus species supports the distinct type of wasps. The wasps enter the unripened fruit and locate the gall flower and lays eggs. While



coming out wasps carry pollen and transfers pollen to the next fruit. This arrangement is well designed for perfect biological function. Amazingly our ancestors were aware of biological phenomena and certain acts.

Stala Vrksa

Certain endemic species were declared as Sthyalavrksas by our ancestors to conserve endemic bio-diversity. The responsibility of the community to protect and propagate that species were also stipulated. It is amazing to note that preservation of bio-diversity was practiced even during vedic age.

Certain ecological key stone species were linked to each deity and communities were made to respect the tree species and to protect them as.

SANSKRIT AND HUMAN EXCELLENCE

It is a matter of tragedy that even after fifty years of independence, India has not been able to establish herself as one of the leading nations excellence, which is an essentiality for attainment of a prestigious position in the committee of nations. Fortunately, this urge for establishing superiority over all nations was there in pre-independence India; and it is because of this that Indian freedom fighters could brave all types of mechanisms of tyranny invented by British Imperialism in its endeavour to retain its control over the country. In post –Independence India the scenario has completely



THE DYNAMICS OF CONSUMER BUYING BEHAVIOUR IN RURAL MARKETS: AN ANALYTICAL STUDY OF JAMMU AND KASHMIR

Dr. Dil Pazir
Sr. Assistant Professor
Bgsbu, Rajouri

Abstract:-

Rural marketing is one of the fast growing marketing sectors nowadays with the base covering more of the potential markets. Indian rural markets consist of nearly 70% of the potential buyers of various goods and services. Rural market provides a strong expansion base for the marketers presenting a large share of untapped attractive profit segments. With the change in the buying behaviours of the consumers, the rural consumers buying behaviour is also influenced by a number of variables. The present study has been undertaken in district Rajouri of Jammu and Kashmir. Through present study the various factors have been evaluated that influence the customer behaviour in the rural markets. The present study also brings out the various challenges and opportunities that are faced by the marketers in marketing of rural services.

Key words: - Rural Market, Rural Consumer, Rural Services

INTRODUCTION

The present marketing atmosphere and economic set-up have brought the corporate under contemporary roofs of modern India, which is challenging the current standards of segmenting, targeting and reaching the customers. India as a nation has come a long way from the place where only urban population which constitutes 20 per cent of customer base for companies are responsible for 80 per cent of their profits. The companies have reached a point where they are witnessing a turn down in their growth rates in urban markets due to market excessive saturation where it's impossible to tap more profits. The



companies thus are looking for more avenues and have shifted their marketing paradigm from just urban markets to rural markets which have a huge potential in terms of growth and profit. In short rural markets present a huge, untouched and untapped market which can prove to be turnover in marketing approaches of the companies. With the change in the life styles of the rural population has adhered to the changing styles with youth being more educated and have the driving force for this is rural youth who are educated, have access to technology and have openness to change. Further rural markets have gained importance, as the overall growth of economy has led to the substantial increase in the purchasing power of the rural communities. National Commission on Agriculture defined "Rural marketing as a process which starts with a choice to produce a marketable farm product and it involves all the aspects of market structure or system both functional and institutional based on economic and technical consideration and includes pre and post-harvest operation, assembling grading storage transportation and distribution. Talking about Indian rural market it has a vast size and demand base which offers great opportunities to markets and the companies. The rural markets forms an important part of the total market structure of India economy.

As per Iyer (2010) Rural Marketing is a task that manages all actions involved in assessing, stimulating and converting the purchasing power of rural consumers into an effective demand for specific products & services and moving these products & services to the people in rural areas to create satisfaction and a better standard of living and thereby achieving organizational goals. The process should be able to include the attitudinal and socio-economic disparity between the urban and rural customers. A major part of rural marketing falls into this category. It includes the transactions of urban marketers who sell their goods and services in rural areas, like pesticides, fertilizers, seeds, FMCG products, tractors, bicycles, consumer durables, etc and is



known as urban to rural marketing. The next segment of marketing involves agricultural marketing where a rural producer seeks to sell his produce in an urban market, like seeds, fruits and vegetables, milk and related products, forest produce, spices, etc and is put in the category of rural to urban market. The next segment includes the activities that take place between two villages in close proximity to each other, like agricultural tools, handicrafts and bullock carts, dress materials, etc and falls in the category of rural to rural marketing.

Companies face many challenge in taking the rural markets, some of the more critical being understanding rural consumers, reaching products and services to remote rural locations and communicating with vastly heterogeneous rural audiences. This research paper focused on the various aspects of rural marketing such as evaluation of rural marketing, opportunities and challenges of rural marketing. Indian rural market has a vast size and demand base. Rural marketing involves the process of developing, pricing, promoting, distributing rural specific product and a service leading to exchange between rural and urban market which satisfies consumer demand and also achieves organizational objectives. Rural marketing is promotion of a company's product in the rural market by using strategies which differ from the urban market. The rural market is more prices sensitive but it has preference to quality. Rural marketing is confused with agriculture marketing. The later denotes marketing of produce of rural areas to the urban consumers or industrial consumers while rural marketing involves delivering manufactured or processed input or services to rural consumers.

In the changing years, rural markets have gained a significant place in the countries like China and India, as the by and large expansion of the economy has resulted in substantial increase in the purchasing power of the rural communities. With the onset of the green revolution in India, the rural areas are consuming a large quantity of industrial and



urban manufactured products. To reach out to such markets a unique marketing strategy, namely, rural marketing has taken shape and being into implementation. Rural India, mostly termed as “high opportunity” market, is no longer just an opportunity, but is now yielding results. The concept of Rural Marketing in India Economy has always played an influential role in the lives of people. In India, leaving out a few metropolitan cities, all the districts and industrial townships are connected with rural markets. The rural consumer is one who says out of the boundaries of the urban market. Indian rural customer is recognised with illiteracy and poverty and a very basic knowledge about the products or the services that is being offered to them. The rural consumer is mostly dependent on agriculture and have a very little or close knowledge about the kind or brands and other specific attributes attached to the products or the services. Moreover products are sold loose, giving high competition to branded sealed products. Ignorance and illiteracy are accompanied by strong influence leaders like the local panchayat members, caste and religious leaders etc. Since rural consumers are economically, socially and educationally backward.

RESEARCH METHODOLOGY

For the conducting the study primary data was collected through a self administered questionnaire. The data was collected so as to study the demographic profile of the customers and the various factors influencing the buying behaviour of the customers. The study uses simple random technique for the survey. For the study 200 questionnaires were distributed among the rural customers using different products and services and for the study 150 responses were found useable for the study.

OBJECTIVES OF THE STUDY

1. To study the demographic profile of the rural markets.



2. To study the various variables influencing the buying behaviour of the customers.
3. To highlight the various challenges and opportunities faced by the marketers in rural markets.

ANALYSIS AND DISCUSSION

Table 1: Demographic Profile of the Respondents

Demographic variables	No of respondents	Percentage (%)
Gender		
Male	90	60
Female	60	40
Total	150	100
Marital status		
Married	115	77
Unmarried	35	23
Total	150	100
Age		
Below 20 years	25	17
25-35 years	45	30
35-45 years	30	20
45-55 years	35	23
Above 55 years	15	10
Total	150	100
income		



Below 20000	54	36
20000- 25000	38	25
25000- 30000	42	28
Above 30000	16	11
Total	150	100

As per the results shown in table 1, 60% of the respondents are males. The marital statuses reveal that 77% of the respondents are married. 30 % of the respondents were from the age group of (25 – 30 years). 36% of the population has below 20000 income.

Table 2: Mode of information

VARIABLES	RESPONDENTS	PERCENTAGE (%)
Television	40	27
Radio	20	13
Newspapers	15	10
Posters	25	17
Banners /hoardings	20	13
Mobile	10	7
Word of mouth	14	9
Others	6	4
Total	150	100

As per the results shown in table 2, 27% of the respondents use television as the mode of communication to know about the product/



service, 25% of the population came to know about the product / service through posters. 20% of the respondents through radio and banners/holdings respectively. 15 % of the respondents became aware through newspapers. 14% of the respondents through word of mouth . 10 % through mobile and 6% through other means.

Table 3: Purchase decision

Variables	Respondents	Percentage (%)
Brand name/ awareness	22	15
Price	50	33
Discounts offered	44	29
Celebrity endorsement	10	7
Language	15	10
Others	9	6
Total	150	100

In table 3, the results reveal that 50% of the respondents depend on price of the commodity while making a purchase. 44% of the respondents on the discount offered. 22% on the brand name/awareness. 15% on the mode of language used. 10% on celebrity endorsement and 9% on others.

Table 4 : Purchase influencers

Variables	Respondents	Percentages (%)
Family	40	27



Reference groups	35	23
Word of mouth	28	19
Peer groups	20	13
Others	27	18
Total	150	100

As per the results in table 4, 40 % of the respondents are influenced their families while making a purchase. 35% of the respondents are influenced by their reference groups.28% of the respondents by the word of mouth. 27% of the respondents by other means and 20 % by their peer groups.

CHALLENGES IN RURAL MAREKTING

Despite of the development of the rural market there are many hurdles to be faced by the marketers to enter the market. The market apart from providing a number of potential space for marketers, has a number of hurdles. The major challenges faced by the marketers in rural marketing involves:-

- The village structure is also a main cause of problem as most of the villages are small and scattered. The scattered nature of the villages increases distribution costs, and their small size affects economic viability of establishing distribution points
- Transportation being an important feature in the process of movement of products to reach the consumers from production point to consumer plays very vital role. The transportation infrastructure is extremely poor in rural India. This is also one of the reason, most of the villages are not accessible by many companies.



- Communication has always been a barrier in rural areas as In India, there are 18 recognized languages. All these languages and many languages are spoken in rural areas. English and Hindi are not understood by many people. Due to these problems, rural consumers, unlike urban consumers do not have exposure to new products
- As production and consumption cycles rarely match, storage function is the basic need for storing the goods before they are supplied. In warehousing too, there are special problems in the rural perspective. It is almost impossible to distribute effectively in the interiors in the absence of adequate storage facilities.
- In rural markets, distribution is difficult because, lack of adequate banking and credit facilities. The rural outlets require banking support to enable transfer of funds, to get replenishment of stocks, to facilitate credit transactions in general, and to obtain credit support from the bank. Retailers are unable to carry optimum stocks in the absence of adequate credit facilities.
- Smaller packages are more popular in the rural areas. The lower income group consumers are not able to purchase large and medium size packaged goods. It is also found that the labelling on the package is not in the local language. This is also a major constraint to rural consumers in understanding the product distinctiveness and for a financial product to sell; some more challenges came to the picture in additions to the scattered rural market, communication (where literacy also takes a strong part) and transportation.

OPPORTUNITIES IN RURAL MARKETING

- According to the 2001 census, 740 million Indians forming 70 per cent of India's population live in rural areas. The rate of



increase in rural population is also greater than that of urban population. The rural population is scattered in over 6 Lakhs villages. The rural population is highly scattered, but holds a big promise for the marketers.

- Purchasing power of the rural people is on rise. Marketers have realized the potential of rural markets, and thus are expanding their operations in rural India. In recent years, rural markets have acquired significance in countries like China and India, as the overall growth of the economy has resulted into substantial increase in purchasing power of rural communities.
- The rural market is growing steadily over the years. Demand for traditional products such as bicycles, mopeds and agricultural inputs; branded products such as toothpaste, tea, soaps and other FMCGs; and consumer durables such as refrigerators, TV and washing machines have also grown over the years.
- There is development of infrastructure facilities such as construction of roads and transportation, communication network, rural electrification and public service projects in rural India, which has increased the scope of rural marketing.
- The standard of living of rural areas is low and rural consumers have diverse socio-economic backwardness. This is different in different parts of the country. A consumer in a village area has a low standard of living because of low literacy, low per capita income, social backwardness and low savings.
- The rural consumer values old customs and traditions. They do not prefer changes. Gradually, the rural population is changing its demand pattern, and there is demand for branded products in villages.



- The urban products cannot be dumped on rural population; separate sets of products are designed for rural consumers to suit the rural demands. The marketing mix elements are to be adjusted according to the requirements of the rural consumers.

CONCLUSION

Rural markets in India hold great potential for business aspiring for long term growth, which is just waiting to be tapped. Progress has been made in this area by some, but there seems to be a long way for marketers to go in order to derive and reap maximum benefits. As per the analysis it was observed that 27 % of the rural population is dependent on television as a means of communication. 50% of the respondents make their purchase decisions based on the price of the commodities. While as 27% of the respondents purchasing decisions are influenced by their families. Thus the marketers should understand that the rural consumer is still not that mature about the market patterns and as such they should adhere to such means and ways that are known to the rural population. Moreover, rural India is not as poor as it used to be a decade or so back. So over the next few years, various new approaches will emerge. Companies will have to build trusting relationships with local communities, building trust can support a company's aspiration to grow and earn profit. Although there are a number of challenges for the marketers when it comes to marketing of goods and services but at the same time the opportunities provided by the market cannot be overlooked.

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THE STATUS OF ELEMENTARY EDUCATION OF INDIAN TRIBES: A PREDICTIVE STUDY BASED ON WEST TRIPURA

Dr. Goutam Saha

Asstt. Professor of Statistics
M.B.B College, Agartala, Tripura

Abstract:

Quality education is followed by quantity education (sometimes literacy rate) in the history of education in a country. Knowledge and employment are two key features of quality education which are, principally, shaped by the level of Elementary Education right at the beginning. However, enrolment, promotion and drop-out have interlinkage which explains the state of things of tri-dimensional process (input-process-output) of Education. The present paper aims to analyze the correlational status among enrolment, promotion and drop-out in elementary level of the Tribal students of West Tripura district. Secondary data sources have been used in terms of 3 ratio variables (DR, PR and PTR) for this present study. Descriptive statistics are used to validate the objective of the study. The studies are further enriched by some key correlation coefficients and two partitioned diagrams. The findings will be helpful to understand and comprehend Elementary Level of Educational status of Tribal students in the West Tripura district. On the light of which government can assign suitable policy tools.

Keywords: Dropout Rate, Promotion Rate, Pupil-Teacher Ratio, Correlation Coefficients Partitioned Diagram.

Introduction:

Elementary Education is the foundation of both knowledge and employability of a grooming person. It gives fillips to develop cognitive skill and aspiration for a gainful career. This level of education is, prima facie, determined by educational legacy of the family, economic



standard of living, parental care and learning skill etc. The Tribal students have been facing some special constraints from that of the mainstream population. Recognising the principle of equity in socio-economic development, the state of the things in the Elementary Level of Education pertaining to the Tribal children has social value. Continuous efforts are made by the Govt., NGOs and other similar bodies to enhance both the quantitative and qualitative aspects of education of that social stratum. The present study focuses on the possibilities of further achievement in this area of analysis.

Objectives of the Study:

The principal objectives of the study are enumerated as under:

- To take the stock of the present scenario in the context of the Elementary Level of Education of Tribal students of the State.
- To understand the responsiveness of DR (Dropout Rate) and PR (Promotion Rate) at different levels of PTR (Pupil-Teacher Ratio).
- To study the effectivity of educational policies and practices of State Govt. in increasing the PR and reducing the DR for expected results.
- To prescribe the appropriate policy-mix on the basis of secondary data analysis

Data and Tools:

In this Analysis the secondary data of SSA has been utilised pertaining to the year 2004-05 to 2014-15 as the unique source.

The popular Statistical tools of Arithmetic Mean (AM) and Correlation Coefficients (r) have been used on selective basis. Partitioned diagrams on the basis of two means of corresponding variables have been



constructed in somewhat different fashions to make eye opening analysis and policy clips.

Statistical Analysis-I:

In this segment of analysis the Statistical table with some selective heads is used to facilitate a fruitful data analysis. In this table 3 type both rates have been accommodated with three selected columns. It is further followed by twin pairs of correlation coefficients and explanations there by.

Table 1: Growth Rate of Total Drop-out Rate, Total Promotion Rate and Pupil-Teacher Ratio (for all Students) of Elementary Education-Tribal Students of West Tripura District

Status Year	DROP-OUT RATE OF TRIBAL STUDENTS				PROMOTION RATE OF TRIBAL STUDENTS				PTR	GR _{PTR} (%)
	BDR	GDR	TDR	GR _{TDR} (%)	BPR	GPR	TPR	GR _{TPR} (%)		
2004-05	31.10	32.77	31.89	-	34.84	33.38	34.15	-	36.99	
2005-06	28.97	28.59	28.79	-9.72	34.79	33.18	34.02	-0.38	38.98	5.38
2006-07	19.78	20.36	20.05	-30.36	24.00	25.50	24.71	27.37	37.78	-3.08
2007-08	10.58	11.66	11.11	-44.59	42.88	44.83	43.85	77.46	35.03	-7.28
2008-09	9.15	13.53	11.22	0.99	36.58	38.61	37.54	14.39	38.54	10.02
2009-10	8.68	8.61	8.64	-22.99	43.17	46.93	45.00	19.87	44.85	16.37
2010-11	6.58	9.01	7.81	-9.61	51.87	52.00	51.94	15.42	34.62	-22.81
2011-12	6.00	5.17	5.58	-28.55	53.42	55.38	54.42	4.77	32.93	-4.88
2012-13	8.66	8.52	8.59	53.94	50.00	54.67	52.45	-3.62	34.32	4.22
2013-14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	34.21	0
2014-15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	31.14	-9
AM	14.39	15.36	14.85	-0.11	41.28	42.72	42.01	0.09	37.12	0.00

Source: SSA Booklet, Government of Tripura (2001-02 to 2014-

15), 2015.



BDR: Boys' Drop-out Rate; GDR:Girls' Drop-out Rate; TDR: Total Drop-out Rate; GR_{TDR} : Growth Rate of Total Drop-out Rate.

BPR: Boys' Promotion Rate;GPR: Girls' Promotion Rate; TPR: Total Promotion Rate; GR_{TPR} : Growth Rate of Total Promotion Rate.

PTR: Pupil-Teacher Ratio; GR_{PTR} : Growth Rate of Pupil-Teacher Ratio; AM: Arithmetic Mean.

In the adjoining table data statement is produced in three principal ratios (DR, PR and PTR). DR and PR have been further sliced into Boys, Girls and Total columns. A percentage column corresponding to TDR, TPR and PTR is raised in each case to diversify the analysis.

About DR:

DR decreases steadily under Boys, Girls and Total columns. The highest level is being almost 30 and the lowest level is attained at almost 6 in all cases. This is a remarkable achievement.

About PR:

The PRs are improved from almost 34 marks (2004-05) to 50 marks (2012-13) in case of Boys, almost 34 to 55 in case of Girls. Similar pattern is repeated under Total category.

About PTR:

PTR registers 36.98 in 2004-05, reaches its apex value (44.48) in 2009-10 following by gradual decrease to 31.14 in 2014-15.PTR is encouraging in the West Tripura district under study.

Growth Rates of TDR, TPR and PTR:

Growth rates of TDR are negative all through. Conversely the growth rate of TPR is positive all through. These reflect the sustained story of success in the respective categories. However the growth rate of PTR, sometimes, increases or decreases. The highest negative rate of growth



or decline in PTR (-22.81) is registered in 2010-11 under the West Tripura district.

Correlation Coefficient between BDR and GDR $r_{BDR,GDR} = 0.986$

SHORT EXPLANATION:

BDR, GDR and their composite output TDR have been diminished significantly over the period of reference (2004-05 to 2014-15). $r_{BDR,GDR}$ reveals the inter-gender consistency of the steady downfall of Tribal Drop-out Rate (DR). In this case it is found that BDR and GDR have decreased over the relevant period quite consistently and harmoniously. This represents a positive aspect in the area of diminishing DR pertaining to Elementary Level of Education of Tribal students in the West Tripura district.

Correlation Coefficient between BPR and GPR $r_{BPR,GPR} = 0.982$

SHORT EXPLANATION:

Recognising that there should be gender neutral achievement of Tribal Boys and Girls in the area of Promotion Rate it is found that ($r_{BPR,GPR}$) is extremely high which fingers out to the fact that PR has increased consistently and almost steadily for both Tribal Boys and Girls over the period of reference. No gender disparity in achievement of higher PR is reflected in the data analysis. Precisely speaking, there exists gender balance in the attainment of higher level of PR by the Tribal Boys and Girls in the West Tripura district.

Correlation Coefficient between PTR and TDR ($r_{PTR,TDR}$) = 0.417

SHORT EXPLANATION:

The value of Correlation Coefficient between PTR & TDR stands 0.417 which is a moderate value. Logically speaking the higher PTR will result in lower TDR and the Correlation Coefficient is expected to be at least moderately negative. In this case it is moderately positive. Thus



the result is paradoxical. Increase of PTR is not the only key determinant of falling DR. The quality dimension and accountability of teachers side by side with critical minimum infrastructure of schools etc. may be given precedence.

Correlation Coefficient between PTR and TDR ($r_{PTR, TDR}$) = 0.261

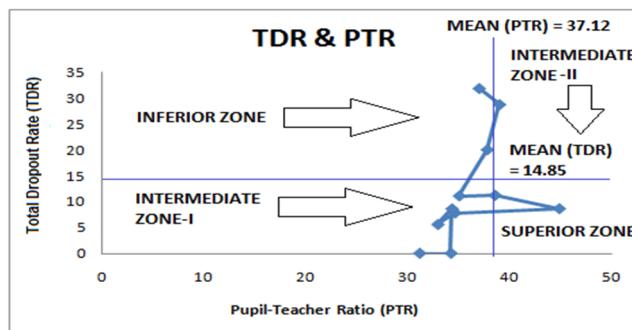
SHORT EXPLANATION:

The value of Correlation Coefficient in this case is supposed to be high not speaking of very high as other key factors must be recognised. In this case the value of Correlation Coefficient is 0.261 which is not the expected value. Thus the growth of PTR is not very effective in increasing the TDR of the Tribal students. Other factors like the level of school infrastructure, the economic background, learning skill and attitudes of the students may have some sort of influence.

Statistical Analysis II:

The partitioned diagrams relating to two pairs of variables are employed to understand the state of progress or achievement of the Tribal Boys and Girls under West Tripura district in the Elementary Level of Education. This will give more succinctness of the present analysis.

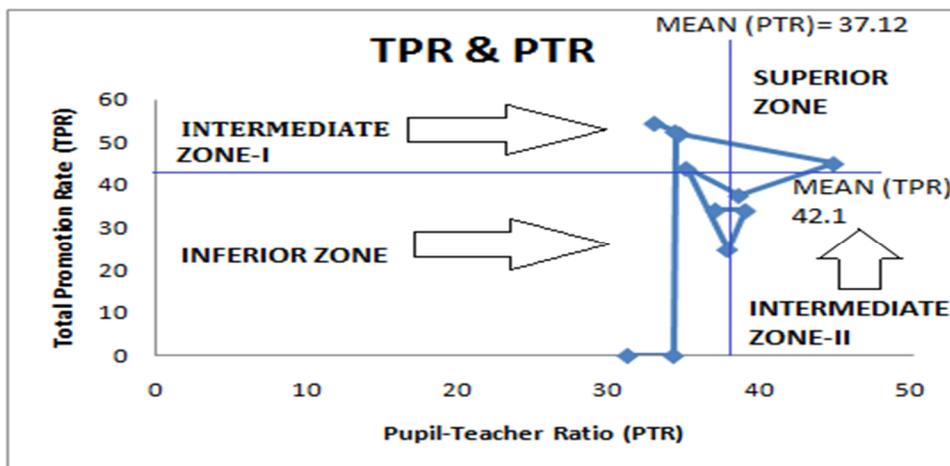
Fig 1:PARTITIONED DIAGRAM-I (Relationship betweenPTR & TDR):





In this diagram the bold blue curve represents the relationship of PTR & TDR corresponding to the Elementary Level of Education of Tribal students under West Tripura district. It is obvious that higher PTR and lower TDR represent the desired state of things (Superior Zone). In this case PTR and TDR behave like input and output in the educational system. The stated diagram is partitioned into four zones with properties of their own. The State Govt. will device policies and direct actions for reaching the superior zone characterised by lower TDR than the mean level (14.85) and higher PTR than the mean level (37.12). Following the arithmetic of the West Tripura district a common guideline can be proposed. If the PTR and TDR situation falls within the intermediate zones I & II respectively than PTR should be increased in the first case and TDR should be decreased in the presence of higher PTR by suitable management of the schools in the second case. However when the situation is explainable by the inferior zone then there will be a policy-mix of curtailing TDR following increase of PTR by the education authority and Govt.

Fig 2: PARTITIONED DIAGRAM-II (Relationship between TPR & PTR):





This diagram as like as the preceding diagram manifests the arithmetical scenario of PTR & TPR in a partitioned setting. As it is obvious that higher level of PTR and higher level of TPR are the ultimate objectives of an educational entity or state craving for achievement in the educational dimension. For partitioning the diagram almost a decade long data of SSA have been used to arrive at the mean values of both PTR & TPR for some reasonable analysis. The rectangular block lying to the north-east of the diagram represents the superior zone and similarly the south-west rectangular block represents the inferior zone. The intermediate zones are splitted up into I & II for underlining the separate policies for reaching to the coveted superior zone. Arrow blocks are used to specify the direction. When a situation falls in intermediate zone-I, just increase of PTR will lead a school or a system of schools to the coveted position at the superior zone. In a situation lying in the intermediate zone-II the higher PTR will facilitate to improve TPR in a significant way under the ostensible guidelines and infrastructural assistance from the end of the Govt.

Policy Guidelines:

- (i) The present set of policies should be carried out further to sustain the present process of educational expansion.
- (ii) The quality education at the Elementary Level is to be improved by raising the probability of employment of the present generation with more cognitive skill development and effective education.
- (iii) PTR is not enough unless the teachers are well skilled and accountable to the students. Presently new accent is given in this area. This should be continued in the just way.
- (iv) There should be new thrust on health and values of the students' right at the Elementary Level to get competitive employment in the changing scenario.



Conclusions:

Keeping in mind all the constraints of a development process the overall findings are very impressive. The educational expansion in quantitative terms relating to the selected community and district is very encouraging. However the quality aspect of education needs some other parameters (infrastructure facility, continuous comprehensive evaluation or CCE, social awareness and health development programmes etc.) for fruitful analysis.

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EXCHANGE RATE DETERMINATION AND BALANCE OF PAYMENTS; THEORIES AND APPROACHES

Dr. Sukhamaya Swain

I. Introduction

According to the official statistics from Bank for International Settlements, foreign-exchange trading stood at an average of \$5.3 trillion a day. In other words, it comes out to be \$220 billion per hour. A higher currency makes a country's exports more expensive and imports cheaper in foreign markets. A lower currency makes a country's exports cheaper and its imports more expensive in foreign markets. A higher exchange rate can be expected to lower the country's balance of trade, while a lower exchange rate would increase it. Thus, exchange rates are very vital and the slightest changes can make or mar a country's economy on a long term horizon. This paper focuses on determination of exchange rate in the floating exchange regime. The forces that guide the determination of exchange rates have for years drawn serious concerns from many scholars all around the global.

II. Determinants of Exchange Rates

1. Inflation Rates

Changes in market inflation cause changes in currency exchange rates. A country with a lower inflation rate than the other country (the one in comparison) will see an appreciation in the value of its currency. This is as per the simple theory that prices of goods and services increase at a slower rate where the inflation is low. This theory is also termed as *Purchasing Power Parity* theorem by some.



2. Interest Rates

Changes in interest rate affect currency value and dollar exchange rate. Forex rates, interest rates, and inflation are all correlated. Increases in interest rates cause a country's currency to appreciate because higher interest rates provide higher rates to lenders, thereby attracting more foreign capital, which causes a rise in exchange rates. *Interest factor usually comes in along with Inflation.*

3. Country's Current Account / Balance of Payments

If a country exports more goods, the importing country will have a higher demand for the currency of the exporting country so as to meet its requirement. A country's current account status (surplus or deficit) reflects balance of trade and earnings on foreign investment. A deficit in current account due to spending more of its currency on importing products than it is earning through sale of exports causes depreciation. Balance of payments fluctuates exchange rate of its domestic currency.

4. Government Policies

Countries incur large public debts to pay for government funding and public welfare projects. Though domestic economy seems to be stimulated with this, international economy suffers. Thus they attract less foreign investors. It is also possible that the government prints more currency to pay some part of the debt. This will further increase supply of money in the market which will ultimately result in inflation. Economic conditions which make the country less attractive to foreign investors ultimately affect its foreign exchange rates.

5. Terms of Trade

Related to current accounts and balance of payments, the terms of trade is the ratio of export prices to import prices. A country's terms of trade improves if its exports prices rise at a greater rate than its imports prices. This results in higher revenue, which causes a higher



demand for the country's currency and an increase in its currency's value. This results in an appreciation of exchange rate.

6. Political Stability & Performance

A country's political state and economic performance can affect its currency strength. A country with less risk for political turmoil is more attractive to foreign investors, as a result, drawing investment away from other countries with more political and economic stability. Increase in foreign capital, in turn, leads to an appreciation in the value of its domestic currency. A country with sound financial and trade policy does not give any room for uncertainty in value of its currency. But, a country prone to political confusions may see a depreciation in exchange rates.

7. Speculation

If a country's currency value is expected to rise, investors will demand more of that currency in order to make a profit in the near future. As a result, the value of the currency will rise due to the increase in demand. With this increase in currency value comes a rise in the exchange rate as well.

III. Historical perspective

Phase I

Pre 1914, the benchmark for trade was a commodity called Gold. Countries used gold as a medium of exchange. The monetary strength of a country was determined by the quantum of Gold. Under a gold standard, the amount of gold a nation holds in bank vaults determines how much of its money circulates. If a nation's gold stock increases through trade, for example, the country issues more currency. Likewise, if its gold stock decreases, it issues less.

All countries are assumed to have fixed exchange rates and independent monetary and fiscal systems and thus they have the need



to hold international reserves for settlement of payment imbalances. This has not been based on an explicit agreement among nations, but represents the outcome of historic evolution.

Gold as currency has obvious problems. First, there is relatively little of it while there are more people and goods all the time. So in the long term, the gold standard exerts a downward pressure on prices as money becomes relatively tighter and its value increases.

Everything was fine and so was this benchmark until the year of World Wars 1914 onwards and 1940s. The benchmark was further complicated by the Great Depression. Researchers tried to normalize these changes in currencies but gold as a measure failed.

Phase II

The earliest systematic unity or ratification came at Bretton Woods in 1944. The need for having a stable system of foreign exchange rate determination was there at it was addressed to a large extent in this conference. The hero of Great Depression, Keynes had already set the ball rolling claiming that "the importance of rule-based regimes to stabilise business expectations something he accepted in the system of fixed exchange rates." The conference was attended by forty-four countries. IMF and IBRD (now known as World Bank) was born at this venue. The members agreed on implementing a system of fixed exchange rates with the U.S. dollar as the key currency.

The system of Bretton Woods of 1944 with its fixed exchange rates do not exist anymore today. Its institutions and procedures had to adjust to market forces to survive but still its goals are as valid today as they have been in the past. The benefits of the Bretton Woods system were a significant expansion of international trade and investment as well as a notable macroeconomic performance: the rate of inflation was lower on average for every industrialised country except Japan than during the period of floating exchange rates that followed, the real per capita



income growth was higher than in any monetary regime since 1879 and the interest rates were low and stable.

In the Bretton Woods system of the 1950s, the US was the center region with essentially uncontrolled capital and goods markets. Europe and Japan, whose capital had been destroyed by the war, constituted the emerging periphery. The periphery countries chose a development strategy of undervalued currencies, controls on capital flows and trade, reserve accumulation, and the use of the center region as a financial intermediary that lent credibility to their own financial systems. In turn, the US lent long term to the periphery, generally through FDI.

Phase III

By the early 1960s, the U.S. dollar's fixed value against gold, under the Bretton Woods system of fixed exchange rates, was seen as overvalued. A sizable increase in domestic spending on President Lyndon Johnson's Great Society programs and a rise in military spending caused by the Vietnam War gradually worsened the overvaluation of the dollar.

The system dissolved between 1968 and 1973. In August 1971, U.S. President Richard Nixon announced the "temporary" suspension of the dollar's convertibility into gold. While the dollar had struggled throughout most of the 1960s within the parity established at Bretton Woods, this crisis marked the breakdown of the system. An attempt to revive the fixed exchange rates failed, and by March 1973 the major currencies began to float against each other.

Since the collapse of the Bretton Woods system, IMF members have been free to choose any form of exchange arrangement they wish (except pegging their currency to gold): allowing the currency to float freely, pegging it to another currency or a basket of currencies, adopting the currency of another country, participating in a currency bloc, or forming part of a monetary union.



IV. Theoretical approaches to Balance of Payments

Since exchange rates affect Balance of Payments, it is essential that one peeks through the various theoretical approaches to Balance of Payments.

Elasticities Approach

This approach focuses on the substitution among commodities, both in consumption as well as in production; each of these induced by the relative price changes brought about by devaluation. In other words, the elasticities approach emphasizes the role of the relative prices (or exchange rate) in balance of payments adjustments by considering imports and exports as being dependent on relative prices (through the exchange rate).

Two characteristics of the special case of elasticities approach:

(i) Any impact of the devaluation on the demand for domestic output is assumed to be met by variations in output and employment rather than relative prices, with the repercussions of variations in output on the balance of payments regarded as secondary. This is made possible by the assumption that supply elasticities are infinite. The assumption of output and employment being variable proved highly unsatisfactory in the immediate postwar period of full and over-full employment.

(ii) The connections between the balance of payments and the money supply, and between the money supply and the aggregate demand, are ignored. This is made possible by the assumed existence of unemployed resources, as well as by the Keynesian skepticism regarding the influence of money. Johnson (1972) emphasizes that the monetary approach differs crucially from the elasticities approach on both these grounds.

A notable shortcoming of the elasticities analysis is its neglect of capital flows. Even though the adherents of the elasticities approach were



attempting to guide the policy-maker in improving the country's balance of payments, their focus, nevertheless, was on the balance of trade (net exports of goods and services).

Absorption Approach

The absorption approach to balance of payments is *general equilibrium* in nature and is based on the Keynesian national income relationships (at time also called Keynesian approach). It runs through the income effect of devaluation as against the price effect to the elasticity approach.

The theory states that if a country has a deficit in its balance of payments, it means that people are 'absorbing' more than they produce. Domestic expenditure on consumption and investment is greater than national income. If they have a surplus in the balance of payments, they are absorbing less. Expenditure on consumption and investment is less than national income. Here the BOP is defined as the difference between national income and domestic expenditure.

In other words, it emphasizes the role of income (or expenditure) in balance of payments adjustments by considering the change in expenditure relative to income resulting from a change in exports and/or imports. In the monetary approach, on the other hand, the focus of attention is on the balance of payments (or the money account) with full employment.

The absorption approach to BOP deficit has been criticized on the following grounds:

1. Ignores Effects on Other Countries: The absorption approach is weak in that it relies too much on policies designed to influence domestic absorption. It does not study the effects of devaluation on the absorption of other countries. This is critical in today's era specifically when each of the countries are interlinked.



2. More Emphasis on Consumption: This approach places more emphasis on the level of domestic consumption than on relative prices. A mere reduction in the level of domestic consumption for reducing absorption does not mean that resources so released will be redirected for improving BOP deficit.

3. Neglects Price Effects: This approach neglects the price effects of devaluation which are very important.

4. Calculations are Difficult: Theoretically, it appears to be superior to the elasticity approach but propensities to consume, save and invest cannot be accurately calculated.

5. Not Operative in a Fixed Exchange Rate System: The absorption approach fails as a corrective measure of BOP deficit under a fixed exchange rate system. When prices rise with devaluation, people reduce their consumption expenditure. With money supply remaining constant, interest rate rises which brings a fall in output along-with absorption. Thus devaluation will have little effect on BOP deficit.

Monetary Approach

According to monetary approach, the relationship between the demand for and supply of money is a crucial determinant of balance of payments. It is treated as a stock (and not flow) over a given time period. The approach rests on the basic principle that for any country over the long run, there exists a stable demand function for money as a stock, i.e., demand for money is a stable, linearly homogeneous function of real income. Thus, similar to any merchandise which is for sale, the foreign exchange value is subjected to the law of supply and demand.

The key element of monetary approach is that it identifies balance of *payments disequilibrium* with adjustments in money market. The relationship between demand for and supply of money is important in



this analysis. They postulate that there is always a tendency towards the stock equilibrium in the money market.

VI. Other notable aspects

J-curve: It postulates that after depreciation or devaluation, the trade balance is expected to deteriorate at first, then improve because the increased value of imports initially would dominate the increased volume of exports, and increased volume of exports would outweigh the increased value of imports later.

Contributors and researchers in the area of BoP

"Elasticities approach," was attributed to a classic essay by Joan Robinson (1950), though traceable to early work by Bickerdike.

The main formal development of the absorption approach is found in the works of Alexander (1952), though many others including Meade (1951), Tinbergen (1952) and Johnson(1958) have contributed. The "absorption" approach of Alexander was an attempt to bypass the "elasticities" issue and go to the heart of the matter, the then prevalent inflationary conditions. Johnson (1977b) describes it as half-way house to the full Keynesian analysis of BoP policy, another half-way house on a different route to the same destination being the extension of the "elasticities" approach by the addition of Keynesian multiplier theory.

According to Machlup (one of the biggest critic of Alexander), Alexander's fundamental equation was nothing more than a definition, and therefore his absorption analysis was nothing more than an implicit theorizing based on tautologies.

The monetary approach was first outlined in the treatment by Hahn (1959) and further developed by Mundell (1968), Johnson (1972), Swoboda (1973), Dornbusch (1973), and Mussa (1974, 1976). Kreinin and Officer (1978), Magee (1976), and Whitman (1975) have reviewed the literature on the monetary approach to balance of payments. The



term "monetary approach" was first used by Mundell (1968) to refer to the new theory (Mussa, 1976).

VI. Conclusion

Role of *demand for* and *supply of* money has been an implicit feature in most attempts to analyze BOP over the past few decades with traditional tools of value theory. The policy of devaluation has a multi-faceted effect. It not only influences the trade flows but also affects the monetary sector. It affects imports, exports, price level, money supply, output etc.. it continues to baffle policy makers and is an active and evolving area of research for the keen.

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HUMAN RIGHTS: DEFINITION AND MEANING

Dr.B.Vijayakumar

Department of Telugu

K.V.R. College

Nandigama

Krishna Dt., Andhra Pradesh

“we hold these truths to be self-evident that all men are created equal that they are endowed by their creator with certain unalienable rights that among these are life ,liberty and the pursuit of happiness.”

United States declaration of independence, 1776. “human rights are rights inherent to all human beings whatever our nationality place of residence ,sex, national or ethnic origin , colour religion , language , or any other status .We are all equally entitled to our human rights without discrimination. These rights are all inter dependent and indivisible’.

All human rights are indivisible, whether they are civil and political rights ,such as the rights to life .equality before the law and freedom of expression ,economic ,social and cultural rights ,such as the rights to work, social security and education, or collective rights, such as the rights to development and self –determination, are indivisible, interrelated and interdependent. The improvement of one right facilitates advancement of the others. Likewise, the deprivation of one right adversely affects the others.

Non discrimination is a cross –cutting principle in International human rights law. The principle is present in all the major human rights treaties and provides the central theme of some of international human rights conventions such as the International convention on the elimination of all forms racial



discrimination and the convention on the elimination of all forms of discrimination against women.

Universal human rights are often expressed and guaranteed by law, in the form of treaties, customary international law, general principles and other sources of international law. International human rights law lays down obligations of governments to act in certain ways or to refrain from certain acts, in order to promote and protect human rights fundamental freedoms of individuals or groups.

The World Wars, and the Huge losses of life and gross abuses of human rights that took place during them, were a driving force behind the development of modern human rights instruments. The League of nations was established in 1919 At the negotiations over the Treaty of Versailles following the end of world war The leagues goals included disarmament, preventing war through collective security, settling disputes between countries through negotiation diplomacy and improving global welfare. Enshrined in its charter was a mandate to promote many of the rights later included in the Universal declaration of human rights.

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DIVERSITY OF ROCKY INTERTIDAL PHYTAL MACROFAUNA ASSOCIATED WITH NINE
DIFFERENT SPECIES OF ALGAE OF VISAKHAPATNAM COAST

Dr.K.Pushpa Raju

Reader in Zoology, Mrs.AVN College
Visakhapatnam, Andhra Pradesh, India

ABSTRACT

Data presented in this paper based on 89 samples collected from three rocky intertidal localities at Visakhapatnam coast to study the abundance, diversity and distribution of macrofaunal groups associated with algae. Quantitative ecological studies of phytal macrobenthos from this region are currently lacking. Our aim in this study is to investigate the relationship between the nature of the algal habitat and distribution of macrobenthos. In particular, the study focuses on testing whether there are significant differences in the abundance, diversity and species composition of phytal macrobenthos on 9 different kinds of algae.

Keywords: Macrofauna, Diversity, Algae, Visakhapatnam coast

INTRODUCTION

In the coastal ecosystems, macro algae play the key role as the basic primary producers. Also they provide food, oxygen and shelter to organisms living the area [1]. Macroalgae together with associated epiphytes are preferred food resources for many littoral invertebrates such as crustaceans, gastropods, annelids, and insects [2, 3]. The most abundant taxa in phytal macrofauna are generally amphipoda, isopoda, mollusca and polychaeta. Although there are several investigations on the systematics of invertebrates dwelling on marine algae, very little information is available with special reference to ecology on macrofauna. [4] have reported the relative numerical abundance of phytal macro and meiofauna from Chilka Lake and [5] has reported the relative numerical abundance of phytal macro and meiofauna from Gangavaram coast, [6, 7] have reported the relative numerical abundance of phytal meiofauna and nematodes from Visakhapatnam coast.

Our aim in this study is to investigate the relationship between the nature of the algal habitat and distribution of macrofauna with particular focus on finding out whether there are significant differences in the abundance, diversity and species composition of phytal macrofauna on 9 different kinds of algae. The purpose of this preliminary report is to provide the first quantitative estimates of macrofauna density from Visakhapatnam intertidal phytal assemblage. Hopefully, this baseline will serve to encourage further investigations of this neglected fauna.

MATERIALS AND METHODS

The present study is aimed to comprehend the distribution, composition and abundance of phytal associated macrofauna in the intertidal zone of Visakhapatnam Coast at three different locations [1.Lawson's Bay:Latitude -17°43'972" N, Longitude - 83°02'641" E, 2.Palm Beach: Latitude -17°43'811" N, Longitude - 83°20'190" E and 3.Coastal Battery: Latitude 17°42'185" N, Longitude - 83°018'538" E].During the investigation, sampling frequency was scheduled on monthly basis from August, 2009 to July, 2010. Nine physiological types of algae were selected to study the faunal association in the intertidal zone, out of which 6 species (*Chaetomorpha antemina*, *Ulva fasciata*, *Ulva lactuca*, *Spongomorpha indica*, *Caulerpa taxifolia*, and *Caulerpa fastigiata*) belong to Chlorophyceae; and 3 species (*Amphiroa fragillisma*, *Gracilaria corticata* and *Bryocladia thwaitessi*) to Rhodophyceae and processed as described by [7].

RESULTS AND DISCUSSION

During this investigation, 18 diverse taxa of macrofauna (non- sessile) represented by Polychaeta (28.8%) ranked first in abundance followed by bivalvia (19.7%), cirripedia (8.7%), amphipoda (7.3%), chironomidae (6.0%), gastropoda (5.6%), echiurida (5.2%), foraminifera (4.3%), isopoda (4.0%), anthozoa (3.9%), tanaidacea (2.9%), decapoda (1.1%), turbellaria (0.9%), pycnogonida (0.5%), echinodermata (0.4%), sipuncula (0.4%), amphineura (0.2%) and ostracoda (0.1%) were encountered (Figure 1). The range, mean and number of months of occurrence of each group of fauna are provided in Table 1 and Figure 2.

The mean values (number of animals/100g of alga) of the phytal sessile fauna associated with the nine seaweeds of the Visakhapatnam coast are presented below in descending order.

Spongomorpha indica (6265.7 no/100g) → *Ulva fasciata* (5452.1 no/100g) → *Amphiroa fragillisma* (4772.2 no/100g) → *Caulerpa taxifolia* (4706.9 no/100g) → *Caulerpa fastigiata* (4172.5 no/100g) →



Bryocladia thwaitessi (3656.0 no/100g) → *Gracilaria corticata* (3368.7 no/100g) → *Ulva lactuca* (1590.2 no/100g) → *Chaetomorpha antennina* (544.7 no/100g) (Figure 2).

Among the nine seaweeds, the tufted shrub like *Spongomorpha indica* was observed to support the highest (6265.7 no/100g) mean density of non-sessile phytal fauna dominated by, bivalves (3670.3), polychaetes (741.7), foraminifera (420.6), gastropoda (360.8), amphipoda (333.2), isopoda (278.6), anthozoa (114.2), and others include chironomidae (90.1), tanaidacea (83.8), turbellaria (73.5), decapoda (52.7), pycnogonida (29.3), echinodermata (8.7) and sipuncula (8.2).

The next abundant non-sessile mean faunal density was observed on the foliaceous plant (fronds lobed with smooth margins), *Ulva fasciata* (5452.1 no/100g of algae) represented by Cirripedia (2681.0), polychaeta (811.4), isopoda (426.4), amphipoda (394.8), tanaidacea (298.8), chironomidae (298.5), gastropoda (163.6) and others include turbellaria (98.3), foraminifera (69.9), bivalvia (67.2), decapoda (42.5), anthozoa (38.3), pycnogonida (17.0), echinodermata (16.5), sipuncula (11.6), amphineura (8.5) and ostracoda (7.9).

Though the flattened thalli *Ulva fasciata* has generally low faunal density than the tufted algae like *Spongomorpha indica*, *Amphiroa fragillisma* and *Caulerpa* sp. [8] in the present study, it has shown high faunal density than the above said algae due to the prominence of single group, i.e., cirripedia larvae which occurred only in the month of July. It harbours appreciably higher faunal density than the upper level algae like *Chaetomorpha antennina*. The relatively higher density of phytal organisms on *Ulva fasciata* may be due to its foliaceous fronds which offer a better habitat for the animals than the filamentous fronds of *Chaetomorpha antennina*. The sheltered location of *Ulva fasciata* in contrast to the exposed nature of *Chaetomorpha antennina* may also be a factor favourable for its relatively higher faunal density. Another reason for its abundance might be due to accumulation of sediment.

Amphiroa fragillisma the tufted, dichotomously branched algae supported the third highest (4772.2 no/100g) mean density of non-sessile phytal fauna represented by polychaeta (1662.3), ampipoda (793.1), isopoda (428.5), chironomidae (395.6), tanaidacea (377.2), cirripedia (274.0), gastropoda (241.5), anthozoa (204.9), foraminifera (113.4), bivalvia (104.6) and others include echinodermata (58.5), turbellaria (51.6), decapoda (27.7), sipuncula (14.3), pycnogonida (8.7), amphineura (8.2) and ostracoda (7.9).

The mean faunal density of rhizoidal crustaceous *Caulerpa taxifolia* (4706.9 no/100g) represented by echiurida (1800), polychaeta (1783.9), foraminifera (347.1), chironomidae (225.2) and amphipoda (168.5) and others include gastropoda (71.9), isopoda (64.9), bivalvia (62.6), pycnogonida (61.9), anthozoa (36.2), decapoda (33.3), sipuncula (14.6), turbellaria (14.5), ostracoda (9.5), tanaidacea (7.3) and echinodermata (5.5). Overall polychaeta are the dominant non-sessile macrofauna but the prominence of echiurida only in the month of July, 2010 expressed its dominance over polychaeta and other faunal composition.

The crustaceous thin filamentous, mat like *Caulerpa fastigiata* supports mean faunal density of 4172.5 no/100g represented by polychaeta (1389.0), gastropoda (716.5), chironomidae (563.2) anthozoa (511.7), bivalvia (312.2), foraminifera (274.5), tanaidacea (131.8) and others include amphipoda (83.1) decapoda (50.6), isopoda (47.6), sipuncula (44.9), turbellaria (24.1), amphineura (12.3) echinodermata (5.7) and pycnogonida (5.1).

The bushy algae, *Bryocladia thwaitessi* supported mean faunal density of 3656.0 no/100g algae, represented by polychaeta (2134.8), bivalvia (408.4), chironomidae (305.1), amphipoda (220.9), anthozoa (133.5), gastropoda (122.5), and others include foraminifera (87.2), decapoda (56.6), tanaidacea (43.0), pycnogonida (37.3), isopoda (36.7), turbellaria (25.6), echinodermata (18.5), sipuncula (9.6), cirripedia (8.7) and amphineura (7.4).

Next abundant mean faunal density of non-sessile fauna was observed in bushy, dichotomously branched cushion like *Gracilaria corticata* (3368.7 no/100g) represented by bivalvia (1682.6), polychaeta (654.5), amphipoda (315.8), anthozoa (252.9), gastropoda (107.2) and others include decapoda (83.1), foraminifera (67.1), isopoda (53.1), tanaidacea (45.0), chironomidae (29.0), echinodermata (21.6), sipuncula (18.4), turbellaria (11.9), pycnogonida (10.6), amphineura (6.2), ostracoda (6.0) and cirripedia (3.7).

The foliaceous algae *Ulva lactuca* (fronds ruffled at margins) supported mean faunal (non-sessile) density of 1590.2 no/100g represented by polychaeta (736.7), bivalvia (274.2), chironomidae (140.0), amphipoda (119.0), gastropoda (115.0) and others include anthozoa (56.8), isopoda (36.5), foraminifera (30.8), decapoda (19.1), turbellaria (17.0), pycnogonida (13.9), echinodermata (8.5), cirripedia (6.8), amphipoda (5.9), tanaidacea (5.4) and sipuncula (4.7).

Ulva fasciata harboured abundant (5452.1 no/100g of algae) and diverse fauna than *Ulva lactuca* (1590.2 no/100g). The relatively higher abundance of *Ulva fasciata* may be due to its occurrence and distribution of algae in the intertidal zone. *Ulva fasciata* was collected from infralittoral zone at Lawson's Bay and *Ulva lactuca* from midlittoral zone at Coastal Battery. The shore structure, exposure and wave action also could be the favourable factors for its higher abundance than *Ulva lactuca*. Rocky shore at Lawson's Bay is



characterised by few jutting rocks which are subjected to emersion during very low tide periods only and hence are exposed to minimum solar radiation. Wave action is also not pronounced owing to the almost flat nature of the substratum where as the rocks at Coastal Battery are massive and high and the wave action is great where the splash covers most of the rocks completely [7].

The simple unbranched filamentous algae *Chaetomorpha antennina* was observed to support low (544.7 no/100g) mean faunal (non-sessile) density among the nine seaweeds represented by bivalvia (237.0), amphipoda (84.3), foraminifera (62.4), gastropoda (40.0) and others include chironomidae (36.5), polychaeta (34.1), cirripedia (15.3), tanaidacea (11.9), isopoda (8.9), amphipoda (5.6), anthozoa (4.5) and turbellaria (4.2).

During the present investigation an important observation made was, the phytal macrofauna existing in nine algae of Visakhapatnam coast were dominated by polychaetes contributing 28.8 % of the total fauna. The highest (2134.8 no/100g alga) annual mean population of polychaetes is observed in *Bryocladia thwaitessi* followed by *Caulerpa taxifolia* (1783.9 no/100g alga); *Amphiroa fragillisma* (1662.3 no/100g alga); *Caulerpa fastigiata* (1389.0 no/100g alga); *Ulva fasciata* (811.4 no/100g alga); *Spongomorpha indica* (741.7 no/100g alga); *Ulva lactuca* (736.7 no/100g alga); *Gracilaria corticata* (654.5 no/100g alga) and *Chaetomorpha antennina* (34.1 no/100g alga). The common polychaete species were *Nereis (Ceratonereis) hircincola*, *Syllis (Typosyllis) prolifera*, *Perinereis cultrifera*, *Autolytus tuberculatus* and *Prionospio streenstrupi*. The polychaetes observed in the seaweeds were predators, deposit and detritus feeders and similar observation made by [9]. **Figure 3a and 3b** shows the mean abundance of different taxa of nine algae at Visakhapatnam Coast.

Bivalvia ranked next to polychaeta constituting 19.7% of the total phytal macrofauna. The distribution of bivalvia seems to be governed by the morphological nature of the weed, its tidal level and the amount of protection it could afford against wave action and insolation [10]. Thus bivalvia is found in abundance on shrub like algae (*Spongomorpha indica*) and low in numbers in filamentous and foliaceous algae (*Chaetomorpha antennina* and *Ulva fasciata*). The highest (3670.3 no/100g alga) abundance of bivalvia was recorded in *Spongomorpha indica* followed by *Gracilaria corticata* (1682.6 no/100g alga); *Bryocladia thwaitessi* (408.4 no/100g alga); *Caulerpa fastigiata* (312.3 no/100g alga); *Ulva lactuca* (274.2 no/100g alga); *Chaetomorpha antennina* (237.0 no/100g alga); *Ulva fasciata* (67.2 no/100g alga); and *Caulerpa taxifolia* (62.6 no/100g alga). Bivalvia form an important component of the phytal fauna, all over the world (Sarma and Ganapati, 1973). They attach to the algae with the byssus threads which can sustain wave action and insolation. The tufted shrub like algae (*Spongomorpha indica*) provides more space for attachment and thus harbours rich number of bivalves than the weak tender *Caulerpa taxifolia*. Among bivalvia *Musculus* sp. and *Modiolus* sp. was found commonly in all nine algae. *Tapes* sp. was sporadic in occurrence.

Cirripedia has contributed 8.7% of the total population. The highest (2680.97 no/100g alga) mean faunal density of cirripedia was recorded in *Ulva fasciata* followed by *Amphiroa fragillisma* (274.01 no/100g alga); *Chaetomorpha antennina* (15.35 no/100g alga); *Bryocladia thwaitessi* (8.68 no/100g alga); *Ulva lactuca* (6.82 no/100g alga); and *Gracilaria corticata* (3.68 no/100g alga). Cirripedia was absent in *Caulerpa taxifolia*, *Caulerpa fastigiata* and *Spongomorpha indica*.

Amphipoda contributed 7.3% of the total population with highest (793.1 no/100g alga) mean density observed in *Amphiroa fragillisma* followed by *Ulva fasciata* (394.8 no/100g alga); *Spongomorpha indica* (333.2 no/100g alga); *Gracilaria corticata* (315.8 no/100g alga); *Bryocladia thwaitessi* (220.9 no/100g alga); *Caulerpa taxifolia* (168.5 no/100g alga); *Ulva lactuca* (119.0 no/100g alga); *Chaetomorpha antennina* (84.3 no/100g alga); and *Caulerpa fastigiata* (83.1 no/100g alga).

Chironomidae contributed 6.0% of the total population. The highest (563.2 no/100g alga) mean value of chironomidae was recorded on *Caulerpa fastigiata* followed by *Amphiroa fragillisma* (395.6 no/100g alga); *Bryocladia thwaitessi* (305.1 no/100g alga); *Ulva fasciata* (298.5 no/100g alga); *Caulerpa taxifolia* (225.2 no/100g alga); *Ulva lactuca* (140.0 no/100g alga); *Spongomorpha indica* (90.1 no/100g alga); *Chaetomorpha antennina* (36.5 no/100g alga) and *Gracilaria corticata* (29.0 no/100g alga).

Overall the percentage of gastropoda constituted 5.6% of the total phytal macrofauna. The highest (716.5 no/100g alga) mean faunal density of gastropods among nine algal seaweeds was observed in *Caulerpa fastigiata* followed by *Spongomorpha indica* (360.8 no/100g alga); *Amphiroa fragillisma* (241.5 no/100g alga); *Ulva fasciata* (163.6 no/100g alga); *Bryocladia thwaitessi* (122.5 no/100g alga); *Ulva lactuca* (115.0 no/100g alga); *Gracilaria corticata* (107.2 no/100g alga); *Caulerpa taxifolia* (71.9 no/100g alga) and *Chaetomorpha antennina* (40.0 no/100g alga). *Cymatium* sp., *Pyrene* sp., *Tornatina* sp., *Nassarius* sp., *Chrysalida* sp., *Cylichna* sp., *Pyrene zebra* and *Cellana radiata* were commonly encountered.

Echiturida was encountered in *Caulerpa taxifolia* contributing 5.2% of the total population with mean faunal density of 1800 no/100g alga.

Foraminifera contributed on an average 4.3% of the total macrofaunal phytal population. *Spongomorpha indica* supported highest (420.6 no/100g alga) mean density followed by *Caulerpa taxifolia* (347.1 no/100g alga); *Caulerpa fastigiata* (274.5 no/100g alga); *Amphiroa fragillisma* (113.4 no/100g alga);



Bryocladia thwaitessi (87.2 no/100g alga); *Ulva fasciata* (69.9 no/100g alga); *Gracilaria corticata* (67.1 no/100g alga); *Chaetomorpha antennina* (62.4 no/100g alga) and *Ulva lactuca* (30.8 no/100g alga).

Isopoda constituted 4.0% of the total population. Among the nine seaweeds *Amphiroa fragillisma* supported highest (428.5 no/100g alga) mean faunal composition followed by *Ulva fasciata* (426.4 no/100g alga); *Spongomorpha indica* (278.6 no/100g alga); *Caulerpa taxifolia* (64.9 no/100g alga); *Gracilaria corticata* (53.1 no/100g alga); *Caulerpa fastigiata* (47.6 no/100g alga); *Bryocladia thwaitessi* (36.7 no/100g alga); *Ulva lactuca* (36.5 no/100g alga) and *Chaetomorpha antennina* (8.9 no/100g alga).

Anthozoa are found to comprise 3.9% of the total population. Abundance of mean faunal density in nine algae are as follows: *Caulerpa fastigiata* supports highest (511.7 no/100g alga) mean faunal density followed by *Bryocladia thwaitessi* (252.9 no/100g alga); *Spongomorpha indica* (204.9 no/100g alga); *Gracilaria corticata* (133.5 no/100g alga); *Amphiroa fragillisma* (114.2 no/100g alga); *Chaetomorpha antennina* (56.8 no/100g alga); *Caulerpa taxifolia* (38.3 no/100g alga); *Ulva lactuca* (36.2 no/100g alga) and *Ulva fasciata* (4.5 no/100g alga).

In the case of tanaidacea, the percentage was observed as 2.9% of total population. The highest (377.2 no/100g alga) mean values for tanaidacea was observed in *Amphiroa fragillisma* followed by *Ulva fasciata* (298.8 no/100g alga); *Caulerpa fastigiata* (131.8 no/100g alga); *Spongomorpha indica* (83.8 no/100g alga); *Gracilaria corticata* (45.0 no/100g alga); *Bryocladia thwaitessi* (43.0 no/100g alga); *Chaetomorpha antennina* (11.9 no/100g alga); *Caulerpa taxifolia* (7.3 no / 100g alga) and *Ulva lactuca* (5.4 no/100g alga).

Decapoda are found to associate with all the algae except *Chaetomorpha antennina*. They comprise 1.1% of the total macrofaunal population. The mean faunal densities of decapoda recorded highest (83.1 no/100g alga) in *Gracilaria corticata* followed by *Bryocladia thwaitessi* (56.6 no/100g alga); *Spongomorpha indica* (52.7 no/100g alga); *Caulerpa fastigiata* (50.6 no/100g alga); *Ulva fasciata* (42.5 no/100g alga); *Caulerpa taxifolia* (33.3 no /100g alga); *Amphiroa fragillisma* (27.7 no/100g alga) and *Ulva lactuca* (19.1no/100g alga).

The group turbellaria constituted 0.9% of the total population. The highest (98.3 no/100g alga) mean density is recorded in *Caulerpa taxifolia* followed by *Amphiroa fragillisma* (73.5 no/100g alga); *Spongomorpha indica* (51.6 no/100g alga); *Gracilaria corticata* (25.6 no/100g alga); *Caulerpa fastigiata* (24.1 no/100g alga); *Chaetomorpha antennina* (17.0 no/100g alga); *Ulva lactuca* (14.5 no/100g alga); *Bryocladia thwaitessi* (11.9 no/100g alga) and *Ulva fasciata* (4.2 no/100g alga).

Overall the pycnogonida constituted 0.5% of the total phytal population. The highest number of pycnogonids were observed in *Caulerpa taxifolia* (61.9 no/100g alga) followed by *Bryocladia thwaitessi* (37.3 no/100g alga); *Spongomorpha indica* (29.3 no/100g alga); *Ulva fasciata* (17.0 no/100g alga); *Ulva lactuca* (13.9 no/100g alga); *Gracilaria corticata* (10.6 no/100g alga); *Amphiroa fragillisma* (8.7 no/100g alga) and *Caulerpa fastigiata* (5.1 no/100g alga). No pycnogonids were encountered in *Chaetomorpha antennina*.

Except *Chaetomorpha antennina*, echinoderms were found in all algae comprising 0.4% of the total population. The highest (58.5 no/100g alga) mean abundance of echinodermata was found in *Amphiroa fragillisma* followed by *Gracilaria corticata* (21.6 no/100g alga); *Bryocladia thwaitessi* (18.5 no/100g alga); *Ulva fasciata* (16.5 no/100g alga); *Spongomorpha indica* (8.7 no/100g alga); *Ulva lactuca* (8.5 no/100g alga); *Caulerpa fastigiata* (5.7 no/100g alga) and *Caulerpa taxifolia* (5.5 no/100g alga).

It has been observed that sipuncula occurs in all the nine algae except *Chaetomorpha antennina*. Among the total phytal population sipuncula comprised of 0.4% with highest (44.9 no/100g alga) mean faunal density in *Caulerpa fastigiata* followed by *Gracilaria corticata* (18.4 no/100g alga); *Caulerpa taxifolia* (14.6 no/100g alga); *Amphiroa fragillisma* (14.3 no/100g alga); *Ulva fasciata* (11.6 no/100g alga); *Bryocladia thwaitessi* (9.6 no/100g alga); *Spongomorpha indica* (8.2 no/100g alga) and *Ulva lactuca* (4.7 no/100g alga).

Amphineura occurred in very less number constituting 0.2% of the total phytal fauna. The mean faunal densities of amphineura in nine seaweeds are, *Caulerpa fastigiata*, 12.3 no/100g alga; *Ulva fasciata*, 8.5 no/100g alga; *Amphiroa fragillisma*, 8.2 no/100g alga; *Bryocladia thwaitessi*, 7.4 no/100g alga; *Gracilaria corticata*, 6.2 no/100g alga; *Ulva lactuca*, 5.9 no/100g alga and *Chaetomorpha antennina*, 5.6 no/100g alga. *Spongomorpha indica* and *Caulerpa taxifolia* were devoid of amphineura.

Ostracoda was sporadic in occurrence comprising of 0.1% of total phytal macrofauna. *Caulerpa taxifolia* supported highest (9.5 no/100g alga) mean faunal density followed by *Amphiroa fragillisma* (8.0 no/100g alga); *Ulva fasciata* (7.9 no/100g alga) and *Gracilaria corticata* (6.0 no/100g alga). Ostracods were absent in *Caulerpa fastigiata*, *Spongomorpha indica*, *Chaetomorpha antennina*, *Bryocladia thwaitessi*, *Ulva lactuca* and *Caulerpa taxifolia*.

Area wise, macrofauna showed significant variations (F: 5.598, P<0.009). Macrofaunal density was abundant at Palm Beach when compared to Lawson's Bay and Coastal Battery. Highest peak was observed at Palm Beach in the month of October, 2009.

The seasonal changes were not clear for individual taxa. A significant variation of numerical abundance was observed area wise. Three groups can be distinguished, one including pycnogonids (Lawson's Bay), turbellarians (Palm Beach) with its highest density in July, 2010; second including amphipods (Palm

Beach), decapods and bivalves (Coastal Battery) with its highest density in October and November, 2009 and third including isopods (Palm Beach) with its highest density in March, 2010 (Figure 4).

Among the nine seaweeds, the tufted shrub like *Spongomorpha indica* retains large quantities of sediment and offers more protection from desiccation, was observed to support the highest (6265.7 no/100g algae) mean density of non-sessile phytal fauna than thin filamentous fronds of *Chaetomorpha antennina* due to poor sediment retention capacity. Faunal associations can also be affected by different physical and chemical properties of algae [11, 12]. It was found that quantitative descriptors of algae, such as the ratio of surface area to biomass, can play a role in epifaunal assemblage structure [11]. Aquatic plants with higher ratios of surface area to biomass are more structurally complex and therefore are capable of supporting more abundant and diverse epifaunal assemblages [11]. However, other studies have shown that macrofaunal assemblage structure can be related to particular attributes of the habitat, for instance the presence of a given algal species [13, 11 and 14]. Associated faunal assemblages often differ to a large extent among algal species [13, 11]. Differences in their relative occurrence, and therefore the level of complexity among locations could lead to numerical differences in the associated fauna. There are a number of studies indicating that an increase in epifaunal abundance, biomass and diversity is directly related to plant quantity [15, 11, 16 and 17].

The period (December, 2009 to April, 2010) of occurrence of high numbers of animal populations coincided with the breeding season of the phytal organisms. Temporal variation in phytal populations can be caused by seasonality in their reproductive activity and recruitment [9, 13 and 18]. The relationship between seasonal variation of animal groups and the physical and developmental state of the algae showed bivalves as the dominant organisms when the algae were prolific while foraminiferans, nematodes, copepods, amphipods, gastropods and polychaetes were the principal faunels when the algae were declining and decaying with heavy epiphytation [9]. The relation of the phytal fauna with the alga is very diverse. The phytal can be looked upon as the breeding and feeding ground for a multitude of animal life. Apart from providing shelter from currents and waves and predators, the ecological advantages of the seaweed regions as a breeding habitat and feeding ground for young and juvenile fish have been emphasized by [19]. Many species inhabiting marine algae depend on them for food. The most common browsers are polychaetes, amphipods and gastropods. The feeding relationships of the algal fauna also vary. Many are filter feeders, detritus feeders, scavengers or carnivores; algivores ranging from minute crustaceans to large sized gastropods. A few organisms are known to suck juice from the algae [20, 21 and 22]. Besides food, there are many other relationships between the fauna and seaweeds. Thus the sea grass have been said to provide shallow marine areas with a "valuable benthic substratum" [23]. The biotic components of the algal faunal communities consist of an endemic assemblage of organisms, which vary with the phases of tides, the time of the day and the season of the year [9].

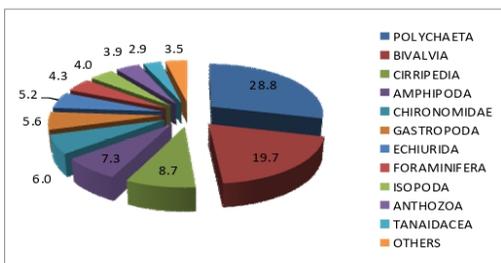


Figure 1: The (%) Distribution of Phytal Macrofauna

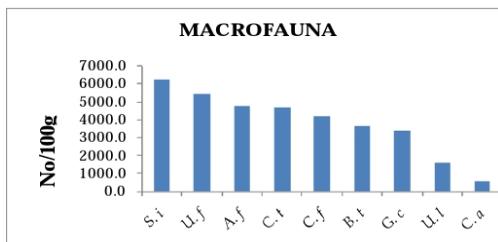


Figure 2: Mean Macrofaunal Abundance of Nine Different Algae at Visakhapatnam Coast

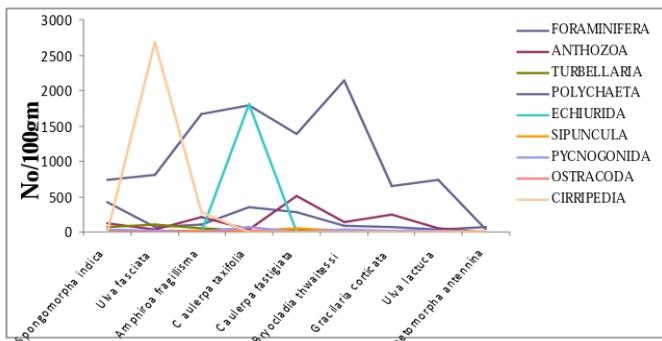


Figure 3a: The Mean Macrofaunal Abundance of Different Taxa of Nine Algae at Visakhapatnam Coast

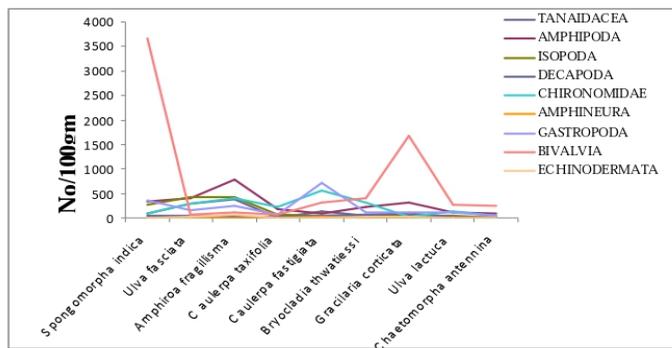


Figure 3b: The Mean Macrofaunal Abundance of Different Taxa of Nine Algae at Visakhapatnam Coast

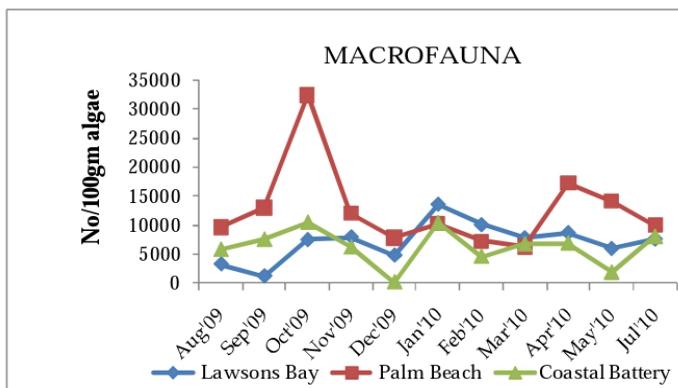


Figure 4: The seasonal Macrofaunal Distribution at Three Areas of Visakhapatnam Coast



CONCLUSIONS

Summing up, meiofaunal habitat has received comparatively little research attention in Indian waters and this study has provided a substantial contribution to current knowledge on the taxonomy and ecology of phytal macrofauna. More importantly, the available information is clearly biased towards the taxonomic approach, quantitative ecological data being scarce.

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