



# RECENT TRENDS IN MULTIDISCIPLINARY SUBJECTS

VOLUME -1

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## **RECENT TRENDS IN MULTIDISCIPLINARY SUBJECTS, VOLUME-1**

*Edited by: Prof. (Dr.) Namita Rajput, Aishwarya Katyal, Dr. Mohd. Shaikhul Ashraf, Dr. Reshmi S, Jisna Johnson, Rashika Durgvanshi, Dr. Venkata Narasimha Rao Inukollu, Anushka Katyal, Dr. Darshini Madanagopal*



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# CHAPTER 1

## COMMUNICATION: BARRIERS & REMEDIES

*Abhijeet Jaysing Bendale*<sup>1</sup>

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### **Abstract-**

At every stage of the communication process, however, there are barriers, which hinder or dilute the flow of communication. The barriers to communication in an organizational context may arise out of authority structure, status difference, reporting relationships, culture and background of individuals. This paper shows a various barriers and remedies of communication that is Poor Expression, Faulty Transmissions, Indifference and Lack of Interest, Noise, Physical Factors, People Related Factors As we have seen earlier, communication is a process that covers six different steps involving, among others, encoding, decoding and transmission. For ensuring effective communication, all the parties and instruments will have to play their part as envisaged.

*Keywords: Communication, Barriers, Remedies*

### **Research Methodology:**

This paper is based on secondary data. The data is gathered from various books, diaries, magazines and sites.

### **Objective:**

- 1) To examine the barriers of communication
- 2) To examination the remedies to overcome the barriers.

### **Introduction:**

Obstructions to correspondence are things that hinder a message being gotten. They could be physical, for example, noisy music playing, or close to home, for example, when an individual is excessively irate or unfortunate to pay attention to what another individual is talking about. Culture, language, and economic wellbeing can likewise address hindrances to viable correspondence. Chiefs should know about boundaries and how to defeat them to further develop the correspondence interaction. Correspondence is one of our essential requirements. We expect to speak with many individuals for individual and expert reason. In any case, while imparting we might confront many obstacles or issues. In some cases the message isn't passed as expected or gets lost. There are chances of misconception between the source or the collector. Here and there language utilized in the correspondence isn't seen as expected. This outcome into Communication breakdown or correspondence disappointment.

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There are many explanations for the issues in the correspondence cycle. We should concentrate on the Communication Barriers exhaustively.

## **Barriers of Communication**

### **1. Phonetic Barriers**

It is the boundary caused because of contrasts in language, tongue or highlight. There are around 6,500 communicated in dialects internationally. What's more, large numbers of them have various accents and vernaculars.

### **2. Mental Barriers**

Viable correspondence requires an ideal equilibrium between feelings and realities. Feelings like resentment, disappointment, and humor can cloud an individual's critical thinking skills. In this way, they limit their correspondence adequacy.

### **3. Profound Barriers**

Viable correspondence requires an ideal harmony between feelings and realities. Feelings like annoyance, disappointment, and humor can cloud an individual's critical thinking skills and, accordingly, keep their correspondence viability.

### **4. Actual Barriers**

Any type of item or sounds purposes a snag in passing on the message. They incorporate clamor, shut entryways, flawed correspondence gear, shut lodges, etc.

### **5. Social Barriers**

Different culture has an alternate conviction, approach to talking and living. Like when individuals from various societies impart in various ways, like communicating in various dialects, holding different social convictions, or utilizing different signals and images. Their social distinctions might become boundaries to compelling correspondence.

### **6. Authoritative Structure Barriers**

In any association, there are numerous ways of conveying. Not utilizing a legitimate correspondence framework or utilizing various correspondence frameworks might make trouble to accurately convey the message.

### **7. Disposition Barriers**

Being too withdrawn or outgoing can make obstructions to powerful correspondence. Pitching fits or inner selves during a discussion is a way that makes others anxious. It decreases the exchange of significant messages.

### **8. Discernment Barriers**

Having various perspectives on a matter can make hindrances to powerful correspondence. Not being thoughtful of one more viewpoint shapes an obstruction in conveying accurately.

### **9. Physiological Barriers**

Explicit issues, illnesses, or different limits may likewise dissuade successful correspondence. The flimsy voice, dyslexia and others are instances of physiological obstructions.

## **Remedies to Overcome the Barriers of Communication**

### **1. Make Your Ideas Clear Before Communicating**

**Make Your Ideas Clear Before Communicating** Give an idea to what you will say. You want to have clear thoughts regarding what you are going to talk. Know the thought process behind the subject. Start with a reasonable objective of correspondence and exact reasoning. To limit unclearness and disarray in the correspondence cycle, clear correspondence expands upon definite terms and substantial words. Making your thoughts clear prior to talking, simplify your message and forthright. The beneficiary will grasp what you're attempting to say. Think about it from begin to end and break down all potential choices when it is a groundbreaking thought you need to share. At the point when you need to make sense of it, be certain that all means and linkages are completely perceived by you and why they exist. Anticipate inquiries from your audience and be ready to respond to them.

### **2. Guarantee the Time of Your Communication is Good**

**Great correspondence** When you address somebody, attempt to see the time and the temperament of the individual. Try not to proceed to thump on your associate after available time. Time is a significant variable in correspondence. At the point when a gathering starts correspondence, you should focus and convey sooner or later. Saying the best thing at the legitimate time is likewise significant. For instance, when your audience is in a miserable circumstance, don't attempt to make an immaterial wisecrack. Or on the other hand, assuming your audience is feeling especially blissful, say nothing that will set off pity or an awful mind-set.

### **3. Utilize a Language Your Listener Can Understand**

**Utilize a Language** You need to guarantee that you are communicating in the language which your audience can comprehend. Make your punctuation and jargon as simple as conceivable while talking and composing. You can constantly show your language abilities in report or proposition composing. In any case, when you are conveying a significant message or chatting officially or casually, keep away from any intricate language or utilizing an alternate complement. Verbal and composed messages that are straightforward and language free draws in your crowd. It will build their advantage in the discussion. Likewise, they will effectively impart to and fro with you.

### **4. Make your Message to the Point and Short**

**Composing messages** when talking or composing messages or visiting, make your message forthright. First and foremost, stay away from any sort of superfluous data. Besides, just convey one thought, thought or feeling at a time. Thirdly, don't make your message excessively extensive. At the point when individuals hear long messages, they typically forget about it, get exhausted or lose interest in the theme. Your message beneficiary will struggle with getting a handle on the message and make a move on it. Accordingly, It will expand your chance to make sense of in the future.

### **5. Check assuming the Other Person has Understood Your Message**

**Speak with somebody** When you speak with another person, guarantee that they comprehended the message appropriately. Giving and mentioning input demonstrates that you are significant about what the other individual says and their perspectives regarding the matter. The thought process of criticism is to decide if the beneficiary has gotten a handle on the meaning of the got data. The response on the beneficiary's face can be perceived in eye to eye correspondence. Be that as it may, the shipper ought to

embrace a fitting criticism technique if there should be an occurrence of composed correspondence or different sorts of interchanges.

### **6. Deal with Your Body Language, Tone and Content of the Message**

Non-verbal communication Your demeanors, signals, stance and voice tones are integral assets. At the point when you are talking, ensure you are speaking with right non-verbal communication. Forcefully offering something great could shock your audience. Utilize a considerate tone is similarly significant. For instance, when you are praising somebody, you need to see it with veritable fervor. Saying "Compliment!" with a miserable face will cause you to appear as though you are not content with their advancement. Whenever you utilize some unacceptable non-verbal communication and tone, the topic of your message can be handily misjudged. Likewise, when you are picking your statement, ensure it isn't problematic and has no sort of multifaceted nuance.

### **7. Tune in before you Speak Again**

Speak as Polonius said in Hamlet, "Give each man thy ear, yet few thy voice." For successful correspondence, you should constantly pay attention to the next individual mindfully. Despite the fact that you and the other individual might have an alternate impression of the subject, paying attention to the individual conquers obstructions. By tuning in, you will cause the other individual to feel that their insight is similarly significant as yours. Moreover, you will be able to give more proper input.

### **8. Try not to Interrupt When Someone Else is speaking**

Try not to hinder somebody strongly stay away from it are addressing hinder somebody when they. Stand by till they are done with what they are talking about. It is viewed as inconsiderate way of behaving. Yet, when you hinder somebody, it diverts them from the things they were saying. Subsequently, they could lose their stream. So on the off chance that you are intruding on somebody, you should have areas of strength for a for it. In any case, stringently try not to talk until the other individual is finished.

### **9. Make your Message Judgment Free**

Try not to talk inconsiderately When you are talking, don't talk discourteously or rudely about somebody's way of life, religion or conviction. It will disparage your audience and may influence your audience inwardly. Subsequently, they will lose interest in the discussion. Regarding others' viewpoints and viewpoints assumes a tremendous part in conquering hindrances to compelling correspondence. If you have any desire to express something about a culture, religion, or conviction, ensure you say it respectfully.

### **Conclusion:**

In this section we have investigated why powerful correspondence matters to associations. Correspondence might separate because of numerous correspondence obstructions that might be credited to the shipper or collector. In this manner, compelling correspondence requires knowledge of the obstructions. Picking the right channel for correspondence is additionally significant, in light of the fact that picking some unacceptable medium subverts the message. At the point when correspondence happens in the culturally diverse setting, additional watchfulness is required, considering that various societies have various standards in regards to nonverbal correspondence, and various words will be deciphered distinctively across societies. By being touchy to the mistakes framed in this section and embracing undivided attention abilities, you might expand your correspondence viability. At each phase of the

correspondence cycle, in any case, there are boundaries, which block or weaken the progression of correspondence. The boundaries to correspondence in an authoritative setting might emerge out of power structure, status contrast, detailing connections, culture and foundation of people. The obstructions to correspondence might emerge out of social contrasts, contrasts in abilities and understanding as well as actual variables. A portion of the hindrances to correspondence incorporate unfortunate articulation, flawed transmission, aloofness and indifference, clamor, individuals related factors and actual elements.

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# CHAPTER 2

## GREEN MARKETING

*Abhijeet Jaysing Bendale*<sup>1</sup>

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### **Abstract-**

The activity of designing and advertising products based on their actual or perceived environmental sustainability is known as green marketing. Advertisement of reduced pollution associated with a product's production process or the use of post-consumer recycled products for a product's packaging are examples of green marketing. Some businesses may also promote themselves as environmentally friendly by contributing a portion of their profits to environmental causes such as tree planting. When a company's green marketing efforts aren't backed up by substantive expenditures or operational changes, they risk being accused of deceptive or false advertising. This paper focus on meaning, importance, and objectives of green marketing, along with its strategies and principles. It will also focus on the marketing mix

**Keywords:** *Green Marketing, Green Price, Green Product, Green Place, Strategies*

### **Research Methodology:**

This paper is based on secondary data. The data is gathered from various books, diaries, magazines and sites.

### **Objective:**

1. To study the meaning, importance, objectives of green marketing
2. To study the strategies and principles of green marketing
3. To study the Marketing Mix of Green Marketing

### **Introduction:**

A free society needs both — an elevated degree of individual abundance and a spotless climate. The private undertaking framework needs to foster the ability of giving the components of a superior personal satisfaction. Ventures need to fulfill natural needs but keep up with their abilities to universally contend. The interest for natural improvement offers chances to virtually a wide range of organizations to take part in this immense market. Appropriately created, these business sectors will make monetary development, which can pay for the natural enhancements looked for. There are two unique kinds of chances. The main open door comes from the way that the organizations won't be permitted to dirty the climate. Organizations should recognize processes whose results are being delivered in the climate and subsequently contaminating it. Organizations have trusted that to diminish the emanations or make them innocuous prior to delivering into the climate is continuously going to cost more. Yet, this isn't true. Whenever organizations utilize new innovations to do their discharge creating processes,

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they observe that the adequacy and proficiency of the cycle is improved, notwithstanding decrease of outflows from them. Accordingly, the organization can recuperate the speculations that it made in upgrading the interaction. The thought is that processes which cause dirtying outflows are intrinsically ineffectual and wasteful, and better cycles ought to be planned utilizing new advancements. Organizations want to accept that putting resources into advances that assist them with diminishing discharges checks out. Their cycles become more productive as well as compelling and they receive the monetary rewards of further developed processes for all times to come. The subsequent open door will arrive at those organizations which will foster the innovations, which will empower organizations to do their cycles in climate well-disposed ways. These organizations should put vigorously in innovative work, yet they can be guaranteed of a tremendous achievement when they concoct advancements that lessen or dispense with contaminating outflows from processes. Simply envision the result assuming an organization were to imagine an auto motor that wouldn't produce any dirtying gas, or on the other hand assuming an organization designed advancements to make plastics which would be biodegradable. There are various such open doors ready to be tapped.

### **Objectives of Green Marketing**

The following are the objectives of green marketing:

1. To help companies meet their corporate social responsibility.
2. To improve the companies' brand and goodwill.
3. To help cut down expenses.
4. To implement sustainable business practices.

### **Importance of Green Marketing**

Increased production and business activities are well known for polluting the natural environment. People, crops, and animals have been harmed in various parts of the world. Since resources are scarce and customers' needs are limitless, marketers must make effective use of resources in order to achieve organizational goals without wasting resources. As a result, green marketing is unavoidable. Consumers, not just marketers, are worried about the environment, and thus, they are modifying their behavior patterns as well. Consumers, both individual and corporate, are becoming increasingly concerned with environmentally friendly goods. As a consequence, the term 'green marketing' has become common and significant:

#### **1. Environmental benefits:**

Going green is a responsible option for the environment. Energy production used by companies to heat, cool, and light workplaces is estimated to account for 40% of all greenhouse gas emissions in the United States. Reducing these energy requirements helps to control global warming by lowering carbon dioxide emissions. Recycling business products and conserving water help to save natural resources on a broader scale because companies use more natural resources than individual customers.

#### **2. Economic benefits:**

Lower operating costs and more savings result from waste reduction. Low-wattage or LED lamps, natural lighting, water management policies, mandatory recycling, and hybrid company vehicles are examples of environmentally sustainable business equipment and activities that save money on utilities, fuel, and office supplies. This results in immediate cash flow. Going green also helps a company gain

favours with clients, potential buyers, vendors, activists, watchdog organizations, communities, and future employees.

### **3. Sustainability:**

Going green is about long-term sustainability; this sustainability leads to long-term profits in green industries with bright prospects. Biomaterials, green buildings, personal transportation, smart grids, mobile applications, and water filtration are among the future-proof markets.

### **4. Efficient resource use:**

Today, human demands and needs are limitless, but resources are so scarce that they cannot be met. Markets must make customers' lives easier by efficiently using resources.

### **5. Planned techniques:**

To accomplish organizational objectives effectively without Wasting time or other resources, it is essential to implement well-planned Techniques and innovative policies.

### **6. Consumer attraction:**

Green marketing entices customers to care about the environment. People are acutely aware of their surroundings and behavioral variations. Green marketing is a form of rising marketing that aids in the development of socially and environmentally responsible goods.

### **7. Innovation:**

Green marketing aids in the creation of goods that are both commercially feasible and effectively meet human needs. It creates cutting-edge green goods that use fewer resources.

## **Methodologies/ Strategies/Principles of Green Marketing**

Organizations wrongly accept that their seriousness will be disintegrated assuming their practices and items become greater climate cordial. Maintainable advancement and showcasing is the way to future productivity and organizations need to embrace the accompanying practices:

1. Organizations need to stick to the least climate principles, yet they ought to decide to follow the most rigid guidelines, and do as such before they become legitimately restricting. Organizations which in all actuality do so get additional opportunity to explore different avenues regarding materials, advances and cycles.
2. Savvy organizations diminish the utilization of non-sustainable assets, for example, coal, petrol and petroleum gas as well as inexhaustible assets like water and wood. The organization works with providers to create eco-accommodating crude materials and parts. They give impetuses to their providers to make them greater climate cognizant.
3. To plan eco-accommodating items, organizations look at item life cycles and comprehend customer concerns. For instance, Clorox found that family cleaning was an ecological concern, and sent off a line of non-engineered cleaning items. It then, at that point, convinced a main ecological gathering to underwrite its items.
4. Organizations concoct new plans of action to convey a similar worth to the client. Fostering another plan of action requires an organization to investigate substitute approaches to addressing client needs.

For instance, FedEx electronically moves an archive to its office in the city, to which the report is to be conveyed. The workplace takes a printout of the report and conveys it to the client.

5. Organizations need to contemplate making conceivable what right now appears to be unimaginable, for example, creating waterless cleansers. The greatest advancements have had their underlying foundations in such reasoning. Planes could never have been made in the event that somebody had not considered flying like a bird.
6. Living beings have prospered on the Earth's biosphere for billions of years. It is an incredible working framework, whose practices should be taken on by organizations which need to rehearse manageable assembling.
7. Nature has in excess of 100 components, however it has utilized just 4 components — carbon, hydrogen, oxygen and nitrogen to make creatures. Organizations ought to take on nature's way, and on second thought of utilizing huge number of materials, they ought to utilize a couple of them, which will likewise make reusing simple.
8. Earth's biosphere follows the act of up-cycling, i.e., when a living being kicks the bucket, it recalls its dead remaining parts, brings it back in its creation interaction, and empowers formation of a higher type of creature. For instance, a dead rodent can be reproduced as a feline. Up-cycling doesn't permit worth of materials to weaken, and its presentation is kept up with, and frequently improved. Organizations also can follow the act of up cycling — when an item's life cycle is finished, it tends to be reused to a more important item.
9. Nature's unique plan of life is the multi-celled creature, which appeared multiple a long time back. The multi-celled life form is a broadly useful plan, and all organic entities have been gotten from this plan. Essentially, organizations can use broadly useful stages, the manner in which Microsoft use Windows.

### **Marketing Mix of Green Marketing**

Green marketers can attract customers based on factors of performance, money saved, health and convenience or environment friendliness in order to target a wide range of environmentally conscious consumers. When companies use innovative techniques like eco-friendly products, they are able to do the following:

- Get through to new markets
- Enhance the market shares
- Increase profits

The four Ps of marketing mix are also used in green marketing, and they are explained as follows:

#### **1. Green product:**

Products have to be designed and created based on the needs and requirements of customers who want eco-friendly products. These can be products made from recycled materials or used goods. Such products save water, energy and money and reduce harmful effects on the environment. The marketer's role in product management in green marketing includes providing product designers with market-driven trends and customer requests for 'green' products, such as they should save energy, be organic, use green chemicals, be locally sourced and so on. For example, Nike has made efforts to position itself as green. It has promoted its Air Jordan shoes as environment friendly because these shoes do not have as much harmful glue adhesives as other shoe brands. These shoes have been positioned to show that there is wastage has

been reduced and environment-friendly materials have been used. The use of energy saving compact fluorescent lamps (CFLs) and battery-powered cars, are attempts at designing eco-friendly products.

## **2. Green price:**

Pricing of green products is done taking into consideration people, planet and profit such that the health and well-being of employees and communities is taken care of and productivity remains efficient. Value addition can be done by changing the appearance, functionality and customization of the products. For instance, Fab India, a popular clothing store, and Khadi Gram Udyog use shopping bags made of recycled paper, jute and plastic.

## **3. Green place:**

In green marketing, the 'place' aspect is about the efficient management of logistics to reduce emissions caused during transportation. This in turn reduces the carbon footprint. For example, a green marketer will instead of marketing an imported wine in India can ensure that it is locally produced. This will also reduce the shipping costs and carbon emission of ships and other modes of transport.

## **4. Green promotion:**

Promotion of green products involves innovative use of promotion techniques, such as advertising and marketing, signage, white papers, Web sites, videos and presentations, by keeping people, environment and profits in mind. For instance, Indian Tobacco Company (ITC) has introduced ecofriendly papers and boards that do not use elemental chlorine for processing. Many automobile companies are in the process of developing hydrogen/electric hybrid technology into their cars. There are three strategies by which advertising can be used for promotion of green products:

- Ads that denote a linkage between a product/service and the environment.
- Ads that promote a green lifestyle.
- Ads that present an image of corporate environmental and social responsibility.

## **Conclusion:**

The action of planning and publicizing items in view of their genuine or seen ecological maintainability is known as green advertising.

1. A free society needs both — an elevated degree of individual riches and a perfect climate. The private venture framework needs to foster the capacity of giving the components of a better personal satisfaction.
2. There are two distinct sorts of chances. The principal opportunity comes from the way that the organizations won't be permitted to dirty the climate. Organizations should recognize processes whose results are being delivered in the climate and subsequently contaminating it.
3. The subsequent open door will arrive at those organizations which will foster the advances, which will empower organizations to complete their cycles in climate amicable ways.
4. Buyers need to assume a significant part on the off chance that organizations must be made answerable for protection of the climate. They ought to quit purchasing results of organizations which are contaminating the climate.
5. Purchasers, not simply advertisers, are stressed over the climate, and accordingly, they are adjusting their ways of behaving too. As a result, the term 'green showcasing' has become normal and critical.

6. Organizations incorrectly accept that their seriousness will be disintegrated assuming their practices and items become greater climate amicable. Maintainable advancement and showcasing is the way to future productivity and organizations need to take on climate agreeable practices.
7. An advertiser should compute the social net productivity of their business activity (social advantage less friendly expense).
8. Green advertisers can draw in clients in light of variables of execution, cash saved, wellbeing and comfort or climate kind disposition to focus on a wide scope of earth cognizant buyers.
9. Climate cordial retailers are taking a gander at ways of addressing the green purchasers' requirements and yearnings. These organizations have a reasonable responsibility and are integrating green ethos across movements of every kind of their associations.
10. Organizations are planning items that utilization more reused material, are produced using fabricating processes that consume lesser energy, and don't transmit unsafe squanders. These are together adding to diminish the carbon impression of the organization

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## CHAPTER 3

# A STUDY ON HEALTHCARE SERVICES MANAGEMENT FOR MULTI-SPECIALITY CANCER HOSPITALS IN INDIA WITH REFERENCE TO MAHARASHTRA

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### **Abstract:**

Healthcare Management is one of the most rapidly evolving sectors in the marketplace in the current scenario. New hospitals are coming across the country and several corporate are also venturing into healthcare and hospital industry. In many ways, healthcare management is a "hidden" career. When we think of a hospital or a clinic, we tend to think of physicians, nurses, and other caregivers. The myriad of people who work in the organizations that support health services delivery organizations, like insurance and managed care companies and government policymaking and regulatory agencies, are even more invisible and are not who we think of when we hear the phrase "health services." Health systems management ensures that specific outcomes are attained, that departments within a health facility are running smoothly, that the right people are in the right jobs that people know what is expected of them, that resources are used efficiently and that all departments are working towards a common goal. In India currently cancer patient & doctor ratio is 1 doctor for 2000 patient. If we manage cancer patient then every cancer patient can get effective treatment. So this research paper shield the light on how can we manage cancer hospital. For this research paper primary data is collected from respective hospital and cancer patient.

*Keywords: Health Services, Hospital Management, Cancer, Cancer Hospital, Health Sector*

### **Introduction:**

**H**ealth care service is one of the fast growing and revenue generating system in and outside India. In India, the contribution of the health care industry for the GDP is tremendous. Health care industry is one of the fast growing industries in the world, adopting the system and technology for the quality improvement in health care service and for enhanced customer satisfaction. Evidence-based practice is the 'conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. There is increasing recognition of gaps between best scientific evidence and clinical practice in many fields of healthcare. This Study based on primary data collected from sample. It has been estimated that up to 40% of patients fail to receive treatments shown to be effective, while 20% to 25% receive treatments that are not needed, or potentially harmful. Reducing the gap between best evidence and clinical practice is associated with reductions in

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patient morbidity and mortality, and reduced healthcare costs. In the past ten years, increasing attention has been directed to addressing barriers to the translation of research into clinical practice to improve patient outcomes.

**Statement of the problem:**

Service sectors are playing an important for the development of any nation. Service sectors includes banking, hotels industry, healthcare sectors, insurance companies, educational institutes etc., are filling the gap between customers and industry. Service management is one which delivering responsibility according to the customer needs and wants. Health service includes promoting the awareness level among the societies towards various diseases and prevention methods and availability of technology. The services includes health education, diagnosis of the patients detecting the particular abnormalities, ward management, documentation, health insurance schemes and advising for well-balanced diet. The diagnostic centres are extending their service for the success of hospitals by collecting the samples and

Preparing the reports on the given time. Pharma sectors are equally contributing by producing and supplying lifesaving drugs for all kinds of infections. Most of the multi-specialty hospitals are promoting their brands in various levels by organizing free health check-up and

Ambulance services. In India we have hundreds of super specialty and multi-specialty hospitals which are delivering health care service with the help of doctors, nurses, Pharmacists, lab technicians and health workers. No doubt that the health care service management in India will definitely bring fame and economic growth.

**Research gap:**

For the past several 100 years, the concept health care was developed by ancient scientist and brought many developments in finding new ideas. Through the research the scientist brought medicine for many incurable problems with the help of natural sources like leaf, root, rizhome, seeds, flowers and bark slowly the traditional procedure and practice have been elevated to modem medicines. Even though there are many scientific research modem medication and surgeries with help of technology, Millions of people dying in India because of not getting treatment of cancer due to there are lack of research in the field of the cancer hospital management .This survey attempted to fill the gap in various aspects of health care services management in cancer hospital in India.

**Need/Significance of the study:**

Cancer is not just one disease. It is a large group of diseases that can start in almost any organ or tissue of the body when abnormal cells grow uncontrollably, go beyond their usual boundaries to invade adjoining parts of the body and/or spread to other organs. The latter process is referred to as metastasizing. Metastases are a major cause of death from cancer. A neoplasm and malignant tumor are other common names for cancer. India has around 2.25 million cases with over 1 lakh new cases being registered every year. In India, there is one government doctor for every 10,189 people. Service sectors are playing an important for the development of any nation. The services include health education, diagnosis of the patients detecting the particular abnormalities, ward management, documentation, and health insurance schemes. The diagnostic centers are extending their service for the success of hospitals by collecting the samples and preparing the reports on the given time. On the shortage of oncologists. Cancer patients can't get treatment but with the effective management of hospital. They can get treatment so this study aims to provide the recommendation to the hospital how they can manage their out-patient department and how

the every single persons who come to hospital can get treatment without consideration of their income level .when the cancer patient enters in the hospital at that moment how can they get not only as soon as possible treatment but also qualitative services within hospital. This study can show that with the effective management of hospital services there will be no delay in treatment of the cancer patients.

**Scope for research work:**

1. There is a huge requirement of professionals who are specially trained in Health care Management. India is gradually gathering popularity as a health tourist destination.
2. Cancer patient can get treatment with the effective management of cancer hospital
3. Medical tourism is a key growth sector for India, as it is projected to be worth \$9 billion by 2020 and become 20% of the global market share in 2020
4. Biggest driver for growth in healthcare tourism is differentiation in medical expenses as compared to the western countries.
5. India ranks second in the world in the medical tourism after Thailand.
6. India's medical tourism industry could grow by 200% by 2020
7. 100 per cent foreign direct investment (FDI) is permitted for health and medical services under the automatic route.
8. India's healthcare insurance sector is also expected to grow at an annual rate of 27%.
9. To meet the manpower shortages Indian government is investing 40 billion dollars over the next five years.

**Objectives of the study:**

1. To identify the factors influencing the success rate of multi-specialty cancer hospitals.
2. To study the awareness on opd miss-management system in hospitals.
3. To evaluate the treatment and service satisfaction level among the cancer patients.
4. To find out the reasons for the cancer patients preferences in selecting the hospitals

**Research methodology:**

The present study is an attempt to examine the health care services management for multi-specialty cancer hospitals in Maharashtra. This study is descriptive in nature but it is types of diganative research. This study is based on sample survey method. Primarily data is collected from specific cancer hospital from Maharashtra. A sample size 50% of total multi-specialty cancer hospital in Maharashtra taken for the study. Non-Probability sampling technique was used. One hundred each sample is taken from patients & HR Professional.

**Tools for data collection:**

**Questionnaire**

- 1) Questionnaire for patient.
- 2) Questionnaire HR professionals.

**Secondary data:**

Magazine, newspaper articles, Governments reports and Related research paper.

**Data interpretation:**

Healthcare industry is one of the emerging sectors, which provide attractive job opportunities and high level health care practice in India and outside India. Healthcare industry consist of many functional areas like multi- specialty cancer hospital, super specialty hospital, primary health centre, diagnostic centre, pharmacy Health insurance and Medical tourism etc. The cancer hospitals are the most respected health care industry and noble sector which provide health care service with modern technology to cancer patient. This study has been divided in to two segments namely Cancer Patients & HR Professional. For the study 05 multi-specialty cancer hospitals have been selected for survey and interpretation. For the analysis purpose, many statistical tools were applied and findings have been represented in terms of tables. In this part of the study, perception of cancer patients have been captured in statements each relating to the why did they chose this specific hospital and how the income matter with choosing hospital for cancer treatment. HR view on what factors affect the success of the hospital.

**Survey Data 1 (Patients)****1) Reasons for choosing a particular hospital for treatment:**

S.No	Reasons	Number of Patients	Percentage	Rank
1.	Speed in completing examination	48	9.6	6
2.	Quality in the treatment	60	12	3
3.	Professionalism in the medical staff	56	11.2	5
4.	Past experience	24	4.8	8
5.	Influenced by friends and relatives	58	11.6	4
6.	Convenient to reach the hospital	32	6.4	7
7.	Religious preference	5	1	10
8.	Personal relationship	13	2.6	9
9.	Less expense for quality service	130	26	1
10.	Reputation of the hospital	74	14.8	2
	Total	500	100%	10

**Source: Computed Primary data**

You can see in the table that 26% cancer patient has chosen the cancer hospital for treatment is less expensive for quality service which ranks no 1. After that reputation of the hospital rank at 2<sup>nd</sup> with 14%. If you know that quality of everything matters in every goods & services so that quality of treatment rank at 3<sup>rd</sup> with 12% of data. 11.6% Influenced by friends and relatives rank at 4<sup>th</sup>. 11.2% Professionalism in the medical staff rank at 5<sup>th</sup>. 9.6% Speed in completing examination rank at 6<sup>th</sup>. 6.4% Convenient to reach the hospital rank at 7<sup>th</sup>. 4.8% past experience rank at 8<sup>th</sup>. 2.6% Personal relationship rank at 9<sup>th</sup>. 1% Religious preference rank at 10<sup>th</sup>. So we can say that less expensive for quality services is the most reason for choosing cancer hospital.

2) *Overall satisfaction level about the Health care service offered by the Hospital?*

SI. No.	Overall satisfaction level Expressed by the Customers for health services.	Number of Patient	percentage
1	Excellent	320	64
2	Good	78	15.6
3	Average	22	4.4
4	Just Satisfactory	56	11.2
5	Not at all/ Poor	24	4.8
6	Total	500	100

**Source: Computed Primary data**

It is not easy to satisfy the customers and obtain excellent feedback about the service quality offered by the Hospitals. The researcher has taken interest to know the overall satisfaction level about the health care services provided by multispecialty cancer Hospitals. The survey revealed that 64% out of the respondents perception on satisfaction was Excellent, 15.6% of the respondent's opinion on satisfaction was good. 11.2% of the respondent view on satisfaction was just satisfactory. Only 4.8% the respondents expressed their satisfaction level was poor.

3) *Give your view on OPD managed by Hospital?*

SI. No.	Patient view on OPD-Managed by Hospital	Number of Patient	percentage
1	Excellent	80	16
2	Good	62	12.4
3	Average	47	9.4
4	Below Average	77	15.4
5	Poor	234	46.8
6	Total	500	100

**Source: Computed Primary data**

In much cancer hospital you can see there is miss management of the outpatient department. Many cancer patients have to wait for their number for meet doctor but they never meet doctor on time which they have given time so the researcher has taken data form cancer patient who were attending OPD in the hospital. In the mode of interview schedule. What is the perception on OPD managed by Hospital? The survey revealed that 46.8% out of the respondent's perception on OPD Management was poor, 15.4% of the respondent's opinion on satisfaction below average. 12.4% of the respondent view on satisfaction was just good. 9.4% of the respondent's opinion on satisfaction was average. Only 16% the respondents expressed their satisfaction level was Excellent.

**Survey Data 2 (HR)****1) Which factors are influencing for success of your hospital?**

Sl. No.	Which factors are influencing for success of your hospital	Number of HR	Percentage
1	Patients' satisfaction	4	16
2	Quality of Service	4	16
3	Commitment of the Doctors	3	12
4	Fees Structure	10	40
5	Caring the cases	3	12
6	Commitment of the Supporting staff	1	3
7	Total	25	100

**Source: Computed Primary data**

Several factors are involving in the successes of health care organization in which cancer patient satisfaction; qualities of service, cost saving and commitment of the supporting staff are taking an important role for the success. The survey examined that patients Fees Structure is in the top rank which is influencing the successes of cancer hospital, quality of service is in the second top rank which also influencing the successes rate, Patients' satisfaction is in the third place, commitment of the doctor is in fourth place and supporting staff are contributing for the successes of the health care organization with sixth position.

**Findings based on objectives:**

- 1) Fees structure is influencing the success rate of multi-specialty cancer hospitals.
- 2) 46.8% data revealed that there is OPD miss-management in cancer hospitals.
- 3) Overall satisfaction level expressed by the cancer patient is 62% with Excellent in the treatment and service satisfaction.
- 4) Less expense for quality service is the most reason for cancer patients selecting the specific cancer hospital.

**Inference:**

Health is the major concern for any living things in the creation of human life by god, human being is the best gift but majority of the human race do not take adequate care of the health. In the modern world, technology is changing everything and motivating health care tips. Multi-specialty cancer hospitals provide various services like health check-up, chemotherapy, radiation, palliative care, scanning, laser surgery techniques and modern tools for handling critical cases like CRS hipec Surgery for advance level of colon cancer. Cancer patients can't get treatment but with the effective management of hospital. They can get treatment so this study shows that if OPD managed well then patient can get treatment within the time period. This study can show that with the effective management of hospital services there will be no delay in treatment of the cancer patients. Dr.A.P.J.Abdulkhalam, formerly president of India, India can shine only when every village gets high level medical facility, healthy food, good living environment and hygienic drinking water. "No Doubt, Health is Wealth". "EFFECTIVE HEALTH CARE DEPENDS ON SELF CARE"

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# CHAPTER 4

## ORTHOGONAL GENERALISED $(\sigma, \tau)$ - N SEMI DERIVATIONS ON SEMIPRIME NEARRINGS

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**Abstract:** In this paper N is a prime nearring, d is a  $(\sigma, \tau)$  - n semi derivation of N and f is a generalised  $(\sigma, \tau)$  - n semi derivation of N.

In this article we proved that, if  $f_1$  and  $f_2$  are orthogonal then

- (i)  $f_1(t_1, t_2, \dots, t_n)f_2(u_1, u_2, \dots, u_n) = f_2(t_1, t_2, \dots, t_n)f_1(u_1, u_2, \dots, u_n) = 0$
- (ii)  $d_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = f_2(d_1(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0$  and  $d_2(f_1(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = f_1(d_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0$
- (iii)  $f_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = f_1(d_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0$

**Keywords:**  $(\sigma, \tau)$ -n semi derivation, generalised  $(\sigma, \tau)$ - n semi derivation, orthogonal generalised  $(\sigma, \tau)$ -n semi derivation.

### INTRODUCTION

Orthogonal derivations were studied by Bresar.M and Vukman.J[7]. They were permuting n- derivations in rings introduced by Ashraf.M and siddeequ. MA.[31]. Further many authors studied the notation of permuting n - derivations in nearrings. Ashraf.M and siddeequ. MA.[32] introduced generalised n - derivations in nearrings.

A non-empty set N with two binary operations, “addition” and “multiplication”, such that

- (i) N is a group concerning addition (not necessarily abelian)
- (ii) N is a semigroup concerning multiplication and
- (iii)  $\forall a, b, c \in N$

If  $(a + b).c = a.c + b.c$  (right distributive law) holds then N is called a right nearring.

If  $a.(b + c) = a.b + a.c$  (left distributive law) holds then N is called a left nearring.

Let n be a positive integer. An n - additive mapping  $f: N \times N \times \dots \times N \rightarrow N$  is called a right generalised  $(\sigma, \tau)$  - n semi derivation associated with  $(\sigma, \tau)$  - n semi derivation d such that the equations

$$f(t_1 t'_1, t_2, \dots, t_n) = f(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n)$$

$$f(t_1, t_2 t'_2, \dots, t_n) = f(t_1, t_2, \dots, t_n)g(\sigma(t'_2)) + \tau(t_2)d(t_1, t'_2, \dots, t_n)$$

$$f(t_1, t_2, \dots, t_n t'_n) = f(t_1, t_2, \dots, t_n)g(\sigma(t'_n)) + \tau(t_n)d(t_1, t_2, \dots, t'_n)$$

and  $g(f(t_1, t_2, \dots, t_n)) = f(g(t_1, t_2, \dots, t_n))$  holds,  $\forall t_1, t'_1, t_2, t'_2, \dots, t_n, t'_n \in N$

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An  $n$  - additive mapping  $f: N \times N \times \dots \times N \rightarrow N$  is called a left generalised  $(\sigma, \tau)$  -  $n$  semi derivation associated with  $(\sigma, \tau)$  -  $n$  semi derivation  $d$  such that the equations

$$f(t_1 t'_1, t_2, \dots, t_n) = d(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)f(t'_1, t_2, \dots, t_n)$$

$$f(t_1, t_2 t'_2, \dots, t_n) = d(t_1, t_2, \dots, t_n)g(\sigma(t'_2)) + \tau(t_2)f(t_1, t'_2, \dots, t_n)$$

⋮

$$f(t_1, t_2, \dots, t_n t'_n) = d(t_1, t_2, \dots, t_n)g(\sigma(t'_n)) + \tau(t_n)f(t_1, t_2, \dots, t'_n)$$

And  $g(f(t_1, t_2, \dots, t_n)) = f(g(t_1, t_2, \dots, t_n))$  holds,  $\forall t_1, t'_1, t_2, t'_2, \dots, t_n, t'_n \in N$

An  $n$  - additive mapping  $f: N \times N \times \dots \times N \rightarrow N$  is called a generalised  $(\sigma, \tau)$  -  $n$  semi derivation associated with a  $(\sigma, \tau)$  -  $n$  semi derivation  $d$  if it is both right generalised  $(\sigma, \tau)$  -  $n$  semi derivation associated with  $(\sigma, \tau)$ -  $n$  semi derivation  $d$  as well as left generalised  $(\sigma, \tau)$ -  $n$  semi derivation associated with  $(\sigma, \tau)$  -  $n$  semi derivation  $d$ .

**Orthogonal  $n$ - semi derivations:**

Let  $d_1, d_2$  are two  $n$ - semi derivations of  $N$ . They are said to be orthogonal if the relation  $d_1(t_1, t_2, \dots, t_n)N d_2(u_1, u_2, \dots, u_n) = 0 =$

$$d_2(u_1, u_2, \dots, u_n)N d_1(t_1, t_2, \dots, t_n) \text{ holds, } \forall t_1, t_2, \dots, t_n, u_1, u_2, \dots, u_n \in N.$$

**Lemma 1:** Suppose  $N$  is a 2- torsion-free semiprime nearring and  $t, u \in N$ , then the following conditions are equivalent.

- (i)  $atb = 0, \forall t \in N$  (ii)  $bta = 0, \forall t \in N$  (iii)  $atb + bta = 0, \forall t \in N$ .

If one of the three conditions is fulfilled, then  $ab = ba = 0$ .

**Proof :** Let us take  $aNb = 0$

$$(bNa)N(bNa) = 0$$

By the semiprimeness of  $N, bNa = 0$

It proves (i)  $\Rightarrow$  (ii)

In the same way, we can prove (ii)  $\Rightarrow$  (i)

Now we can prove (iii)  $\Rightarrow$  (i)

For this  $atb + bta = 0, \forall t \in N$

$$\text{From the above } (aub)v(aub) = -(buava)ub = au(avb)ub = -aubvaub.$$

$$2(aub)v(aub) = 0$$

Since  $N$  is 2-torsion free and semiprime

$$aub = 0$$

If  $aub = 0$  then  $abuab = 0$  and  $bauba = 0$

By the semiprimeness of  $N$ , we have  $ab = ba = 0$ . ■

**Lemma 2:** Suppose  $N$  is a nearring and  $d$  is a  $(\sigma, \tau)$  -  $n$  semi derivation of  $N$  associated with a surjective function  $g: N \times N \times \dots \times N \rightarrow N$  then

$$\{d(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n)\}u$$

$$= d(t_1, t_2, \dots, t_n)g(\sigma(t'_1))u + \tau(t_1)d(t'_1, t_2, \dots, t_n)u,$$

$$\{d(t_1, t_2, \dots, t_n)g(\sigma(t'_2)) + \tau(t_2)d(t_1, t'_2, \dots, t_n)\}u$$

$$= d(t_1, t_2, \dots, t_n)g(\sigma(t'_2))u + \tau(t_2)d(t_1, t'_2, \dots, t_n)u,$$

⋮

$$\begin{aligned} & \{d(t_1, t_2, \dots, t_n)g(\sigma(t'_n)) + \tau(t_n)d(t_1, t_2, \dots, t'_n)\}u \\ & = d(t_1, t_2, \dots, t_n)g(\sigma(t'_n))u + \tau(t_n)d(t_1, t_2, \dots, t'_n)u, \quad \forall t_1, t'_1, t_2, t'_2 \dots t_n, t'_n \in N \end{aligned}$$

**Proof:** Let

$$\begin{aligned} d((t_1 t'_1 t''_1, t_2, \dots, t_n)) & = d(t_1 t'_1, t_2, \dots, t_n)g(\sigma(t''_1)) + \tau(t_1 t'_1)d(t''_1, t_2, \dots, t_n) \\ & = \{d(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n)\}g(\sigma(t''_1)) + \tau(t_1)\tau(t'_1)d(t''_1, t_2, \dots, t_n) \end{aligned} \quad (1)$$

On the other side we have

$$\begin{aligned} d(t_1(t'_1 t''_1), t_2, \dots, t_n) & = d(t_1, t_2, \dots, t_n)g(\sigma(t'_1 t''_1)) + \tau(t_1)d(t'_1 t''_1, t_2, \dots, t_n) \\ & = d(t_1, t_2, \dots, t_n)g(\sigma(t'_1)\sigma(t''_1)) + \tau(t_1)\{d(t'_1, t_2, \dots, t_n)g(\sigma(t''_1)) + \tau(t'_1)d(t''_1, t_2, \dots, t_n)\} \\ & = d(t_1, t_2, \dots, t_n)g(\sigma(t'_1))g(\sigma(t''_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n)g(\sigma(t''_1)) + \tau(t_1)\tau(t'_1)d(t''_1, t_2, \dots, t_n) \end{aligned} \quad (2)$$

From equations (1) and (2)

$$\begin{aligned} & \{d(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n)\}g(\sigma(t''_1)) \\ & = d(t_1, t_2, \dots, t_n)g(\sigma(t'_1))g(\sigma(t''_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n)g(\sigma(t''_1)). \end{aligned}$$

Since  $g$  is onto and by the automorphism  $\sigma$  of  $N$ , substitute  $u$  in the place of  $g(\sigma(t''_1))$  where  $u \in N$ , we have

$$\begin{aligned} & \{d(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n)\}u \\ & = d(t_1, t_2, \dots, t_n)g(\sigma(t'_1))u + \tau(t_1)d(t'_1, t_2, \dots, t_n)u \end{aligned}$$

Similarly we prove other  $(n-1)$  relations. ■

**Lemma 3:** Suppose  $N$  is a nearring admitting a right generalised  $(\sigma, \tau)$  - nsemiderivation  $f$  associated with  $(\sigma, \tau)$  -  $n$  semi derivation  $d$  of  $N$  then

$$\begin{aligned} & \{f(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n)\}u = \\ & f(t_1, t_2, \dots, t_n)g(\sigma(t'_1))u + \tau(t_1)d(t'_1, t_2, \dots, t_n)u \\ & \{f(t_1, t_2, \dots, t_n)g(\sigma(t'_2)) + \tau(t_2)d(t_1, t'_2, \dots, t_n)\}u = \\ & f(t_1, t_2, \dots, t_n)g(\sigma(t'_2))u + \tau(t_2)d(t_1, t'_2, \dots, t_n)u \\ & \quad \vdots \\ & \{f(t_1, t_2, \dots, t_n)g(\sigma(t'_n)) + \tau(t_n)d(t_1, t_2, \dots, t'_n)\}u = \\ & f(t_1, t_2, \dots, t_n)g(\sigma(t'_n))u + \tau(t_n)d(t_1, t_2, \dots, t'_n)u, \quad \forall t_1, t'_1, t_2, t'_2 \dots t_n, t'_n, y \in N \end{aligned}$$

**Proof:** For all  $t_1, t'_1, t''_1, t_2, t'_2 \dots t_n, t'_n \in N$

$$\begin{aligned} f((t_1 t'_1 t''_1, t_2, \dots, t_n)) & = f((t_1 t'_1), t_2, \dots, t_n)g(\sigma(t''_1)) + \tau(t_1 t'_1)d(t''_1, t_2, \dots, t_n) \\ & = (f(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n))g(\sigma(t''_1)) + \tau(t_1)\tau(t'_1)d(t''_1, t_2, \dots, t_n) \end{aligned} \quad (3)$$

$$\begin{aligned} \text{And also } f(t_1(t'_1 t''_1), t_2, \dots, t_n) & = f(t_1, t_2, \dots, t_n)g(\sigma(t'_1 t''_1)) + \tau(t_1)d(t'_1 t''_1, t_2, \dots, t_n) \\ & = f(t_1, t_2, \dots, t_n)g(\sigma(t'_1))g(\sigma(t''_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n)g(\sigma(t''_1)) + \tau(t_1)\tau(t'_1)d(t''_1, t_2, \dots, t_n) \end{aligned} \quad (4)$$

From equations (3) and (4) we get

$$\begin{aligned} & (f(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n))g(\sigma(t''_1)) \\ & = f(t_1, t_2, \dots, t_n)g(\sigma(t'_1))g(\sigma(t''_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n)g(\sigma(t''_1)) \end{aligned}$$

Since  $\sigma$  is an automorphism, substitute  $u$  in the place of  $g(\sigma(t''_1))$

$$\begin{aligned} & \left( f(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)d(t'_1, t_2, \dots, t_n) \right) u = \\ & f(t_1, t_2, \dots, t_n)g(\sigma(t'_1))u + \tau(t_1)d(t'_1, t_2, \dots, t_n)u \end{aligned}$$

We prove other (n-1) relations similarly. ■

**Lemma 4:** Suppose  $N$  is a nearring admitting a left generalised  $(\sigma, \tau)$ - nsemiderivation  $f$  associated with  $(\sigma, \tau)$  - n semi derivation  $d$  of  $N$  then

$$\begin{aligned} & \left( d(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)f(t'_1, t_2, \dots, t_n) \right) u = \\ & d(t_1, t_2, \dots, t_n)g(\sigma(t'_1))u + \tau(t_1)f(t'_1, t_2, \dots, t_n)u \\ & \left( d(t_1, t_2, \dots, t_n)g(\sigma(t'_2)) + \tau(t_2)f(t_1, t'_2, \dots, t_n) \right) u = \\ & d(t_1, t_2, \dots, t_n)g(\sigma(t'_2))u + \tau(t_2)f(t_1, t'_2, \dots, t_n)u \\ & \vdots \\ & \left( d(t_1, t_2, \dots, t_n)g(\sigma(t'_n)) + \tau(t_n)f(t_1, t_2, \dots, t'_n) \right) u = \\ & d(t_1, t_2, \dots, t_n)g(\sigma(t'_n))u + \tau(t_n)f(t_1, t_2, \dots, t'_n)u, \forall t_1, t'_1, t_2, t'_2, \dots, t_n, t'_n, y \in N \end{aligned}$$

**Proof:** For all  $t_1, t'_1, t''_1, t_2, t'_2, \dots, t_n, t'_n \in N$

$$\begin{aligned} f((t_1 t'_1) t''_1, t_2, \dots, t_n) &= f((t_1 t'_1), t_2, \dots, t_n)g(\sigma(t''_1)) + \tau(t_1 t'_1)d(t''_1, t_2, \dots, t_n) = \\ & d(t_1, t_2, \dots, t_n)g(\sigma(t''_1)) + \tau(t_1)f(t'_1, t_2, \dots, t_n)g(\sigma(t''_1)) + \tau(t_1)\tau(t'_1)d(t''_1, t_2, \dots, t_n) \end{aligned} \tag{5}$$

On the other side

$$\begin{aligned} f(t_1(t'_1 t''_1), t_2, \dots, t_n) &= d(t_1, t_2, \dots, t_n)g(\sigma(t'_1 t''_1)) + \tau(t_1)f(t'_1 t''_1, t_2, \dots, t_n) \\ &= d(t_1, t_2, \dots, t_n)g(\sigma(t'_1))g(\sigma(t''_1)) + \tau(t_1)(f(t'_1, t_2, \dots, t_n)g(\sigma(t''_1)) + \tau(t'_1)d(t''_1, t_2, \dots, t_n)) \\ &= d(t_1, t_2, \dots, t_n)g(\sigma(t'_1))g(\sigma(t''_1)) + \tau(t_1)f(t'_1, t_2, \dots, t_n)g(\sigma(t''_1)) + \tau(t_1)\tau(t'_1)d(t''_1, t_2, \dots, t_n) \end{aligned} \tag{6}$$

From equations (5) and equations (6)

$$\begin{aligned} & \left( d(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)f(t'_1, t_2, \dots, t_n) \right) g(\sigma(t''_1)) \\ &= d(t_1, t_2, \dots, t_n)g(\sigma(t'_1))g(\sigma(t''_1)) + \tau(t_1)f(t'_1, t_2, \dots, t_n)g(\sigma(t''_1)) \end{aligned}$$

Since  $\sigma$  is an automorphism, substituting  $u$  in the place of  $g(\sigma(t''_1))$

$$\begin{aligned} & \left( d(t_1, t_2, \dots, t_n)g(\sigma(t'_1)) + \tau(t_1)f(t'_1, t_2, \dots, t_n) \right) u \\ &= d(t_1, t_2, \dots, t_n)g(\sigma(t'_1))u + \tau(t_1)f(t'_1, t_2, \dots, t_n)u \end{aligned}$$

We prove other (n-1) relations similarly. ■

**Lemma 5:** Suppose  $N$  is a 2-torsion free semiprime nearring and  $f_1, f_2$  be any two generalised  $(\sigma, \tau)$  - n semi derivations of  $N$ . If  $f_1$  and  $f_2$  are orthogonal then the following conditions are true.

(i)  $f_1(t_1, t_2, \dots, t_n)f_2(u_1, u_2, \dots, u_n) = f_2(t_1, t_2, \dots, t_n)f_1(u_1, u_2, \dots, u_n) = 0$

(ii)  $d_1$  and  $f_2$  are orthogonal and

$$d_1(t_1, t_2, \dots, t_n)f_2(u_1, u_2, \dots, u_n) = f_2(u_1, u_2, \dots, u_n)d_1(t_1, t_2, \dots, t_n) = 0$$

(iii)  $d_2$  and  $f_1$  are orthogonal and

$$d_2(t_1, t_2, \dots, t_n)f_1(u_1, u_2, \dots, u_n) = f_1(u_1, u_2, \dots, u_n)d_2(t_1, t_2, \dots, t_n) = 0$$

(iv)  $d_1$  and  $d_2$  are orthogonal and  $d_1(d_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0$

(v)  $d_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = f_2(d_1(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0$  and

$$d_2(f_1(t_1, t_2 \dots t_n), u_2 \dots u_n) = f_1(d_2(t_1, t_2 \dots t_n), u_2 \dots u_n) = 0$$

$$(vi) f_1(f_2(t_1, t_2 \dots t_n), u_2 \dots u_n) = f_1(d_2(t_1, t_2 \dots t_n), u_2 \dots u_n) = 0$$

**Proof:** (i) Since  $f_1$  and  $f_2$  are orthogonal we have

$$f_1(t_1, t_2 \dots t_n) v f_2(u_1, u_2 \dots u_n) = 0, \forall t_1, t_2, \dots t_n, u_1, u_2 \dots u_n, v \in N$$

From lemma 1

$$f_1(t_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = f_2(t_1, t_2 \dots t_n) f_1(u_1, u_2 \dots u_n) = 0,$$

$$\forall t_1, t_2, \dots t_n, u_1, u_2 \dots u_n \in N$$

(ii) From (i) we have  $f_1(t_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$

Replace  $t_1$  with  $t_1 t'_1$  where  $t'_1 \in N$  in the above equation and also from lemma 3

$$f_1(t_1 t'_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$$

$$(f_1(t_1, t_2 \dots t_n) g_1(\sigma(t'_1)) + \tau(t_1) d_1(t'_1, t_2 \dots t_n)) f_2(u_1, u_2 \dots u_n) = 0$$

$$f_1(t_1, t_2 \dots t_n) g_1(\sigma(t'_1)) f_2(u_1, u_2 \dots u_n) + \tau(t_1) d_1(t'_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$$

Since  $g_1$  is onto and  $\sigma$  is an automorphism of  $N$

$$f_1(t_1, t_2 \dots t_n) t'_1 f_2(u_1, u_2 \dots u_n) + \tau(t_1) d_1(t'_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$$

Since  $f_1$  and  $f_2$  are orthogonal and  $t'_1 \in N$ ,  $\tau(t_1) d_1(t'_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$

From the semiprimeness of  $N$  and  $\tau$  is an automorphism of  $N$

$$d_1(t'_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$$

Replace  $t_1$  with  $t_1 t'_1$  where  $t'_1 \in N$  in the above equation and also from lemma 2

$$d_1(t_1 t'_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$$

$$(d_1(t_1, t_2 \dots t_n) g_1(\sigma(t'_1)) + \tau(t_1) d_1(t'_1, t_2 \dots t_n)) f_2(u_1, u_2 \dots u_n) = 0$$

$$d_1(t_1, t_2 \dots t_n) g_1(\sigma(t'_1)) f_2(u_1, u_2 \dots u_n) + \tau(t_1) d_1(t'_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$$

$$d_1(t_1, t_2 \dots t_n) g_1(\sigma(t'_1)) f_2(u_1, u_2 \dots u_n) = 0$$

Since  $g_1$  is onto and  $\sigma$  is an automorphism of  $N$

$$d_1(t_1, t_2 \dots t_n) t'_1 f_2(u_1, u_2 \dots u_n) = 0$$

By lemma 1,  $f_2(u_1, u_2 \dots u_n) d_1(t_1, t_2 \dots t_n) = 0, \forall t_1, t_2, \dots t_n, u_1, u_2 \dots u_n \in N$

(iii) The proof is similar to (ii)

(iv) From (i)  $f_1(t_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$

Replace  $t_1$  with  $t'_1 t_1$  where  $t'_1 \in N$  in the above equation and also from lemma 3

$$f_1(t'_1 t_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$$

$$(f_1(t'_1, t_2 \dots t_n) g_1(\sigma(t_1)) + \tau(t'_1) d_1(t_1, t_2 \dots t_n)) f_2(u_1, u_2 \dots u_n) = 0$$

$$f_1(t'_1, t_2 \dots t_n) g_1(\sigma(t_1)) f_2(u_1, u_2 \dots u_n) + \tau(t'_1) d_1(t_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$$

Since  $g_1$  is onto and  $\sigma$  is an automorphism of  $N$

$$f_1(t'_1, t_2 \dots t_n) t_1 f_2(u_1, u_2 \dots u_n) + \tau(t'_1) d_1(t_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$$

Since  $f_1$  and  $f_2$  are orthogonal and  $t_1 \in N$ ,

$$\tau(t'_1) d_1(t_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) = 0$$

Replace  $u_1$  with  $u_1 u'_1$  where  $u'_1 \in N$ ,

$$\tau(t'_1) d_1(t_1, t_2 \dots t_n) f_2(u_1 u'_1, u_2 \dots u_n) = 0$$

$$\tau(t'_1) d_1(t_1, t_2 \dots t_n) (f_2(u_1, u_2 \dots u_n) g_2(\sigma(u'_1)) + \tau(u_1) d_2(u'_1, u_2 \dots u_n)) = 0$$

$$\tau(t'_1) d_1(t_1, t_2 \dots t_n) f_2(u_1, u_2 \dots u_n) g_2(\sigma(u'_1)) + \tau(t'_1) d_1(t_1, t_2 \dots t_n) \tau(u_1) d_2(u'_1, u_2 \dots u_n) = 0$$

$$\tau(t'_1) d_1(t_1, t_2 \dots t_n) \tau(u_1) d_2(u'_1, u_2 \dots u_n) = 0$$

Since  $\tau$  is an automorphism of  $N$ ,  $t'_1 d_1(t_1, t_2 \dots \dots t_n) u_1 d_2(u'_1, u_2 \dots \dots u_n) = 0$

From the semiprimeness of  $N$ ,  $d_1(t_1, t_2 \dots \dots t_n) u_1 d_2(u'_1, u_2 \dots \dots u_n) = 0$

Therefore,  $d_1$  and  $d_2$  are orthogonal.

Now  $d_1(d_1(t_1, t_2 \dots \dots t_n) u_1 d_2(u'_1, u_2 \dots \dots u_n), v_2, v_3, \dots \dots v_n) = 0$

$d_1(d_1(t_1, t_2 \dots \dots t_n), v_2, v_3, \dots \dots v_n) g_1(\sigma(u_1 d_2(u'_1, u_2 \dots \dots u_n))) +$

$\tau(d_1(t_1, t_2 \dots \dots t_n)) d_1(u_1 d_2(u'_1, u_2 \dots \dots u_n), v_2, v_3, \dots \dots v_n) = 0$

Since  $g_1$  is onto and  $\sigma, \tau$  are automorphisms of  $N$

$d_1(d_1(t_1, t_2 \dots \dots t_n), v_2, v_3, \dots \dots v_n) u_1 d_2(u'_1, u_2 \dots \dots u_n) +$

$d_1(t_1, t_2 \dots \dots t_n) d_1(u_1 d_2(u'_1, u_2 \dots \dots u_n), v_2, v_3, \dots \dots v_n) = 0$

Since  $d_1$  and  $d_2$  are orthogonal

$d_1(t_1, t_2 \dots \dots t_n) d_1(u_1 d_2(u'_1, u_2 \dots \dots u_n), v_2, v_3, \dots \dots v_n) = 0$

$d_1(t_1, t_2 \dots \dots t_n) (d_1(u_1, v_2, v_3, \dots \dots v_n) g_1(\sigma(d_2(u'_1, u_2 \dots \dots u_n)))) +$

$\tau(u_1) d_1(d_2(u'_1, u_2 \dots \dots u_n), v_2, v_3, \dots \dots v_n) = 0$

$d_1(t_1, t_2 \dots \dots t_n) d_1(u_1, v_2, v_3, \dots \dots v_n) g_1(\sigma(d_2(u'_1, u_2 \dots \dots u_n))) +$

$d_1(t_1, t_2 \dots \dots t_n) \tau(u_1) d_1(d_2(u'_1, u_2 \dots \dots u_n), v_2, v_3, \dots \dots v_n) = 0$

Since  $g_1$  is onto and  $\sigma, \tau$  are automorphisms of  $N$

$d_1(t_1, t_2 \dots \dots t_n) d_1(u_1, v_2, v_3, \dots \dots v_n) d_2(u'_1, u_2 \dots \dots u_n) +$

$d_1(t_1, t_2 \dots \dots t_n) u_1 d_1(d_2(u'_1, u_2 \dots \dots u_n), v_2, v_3, \dots \dots v_n) = 0$

Since  $d_1$  and  $d_2$  are orthogonal and from lemma 1

$d_1(t_1, t_2 \dots \dots t_n) u_1 d_1(d_2(u'_1, u_2 \dots \dots u_n), v_2, v_3, \dots \dots v_n) = 0$

Replace  $t_1$  with  $d_2(u'_1, u_2 \dots \dots u_n)$  and  $t_2$  with  $v_2, t_3$  with  $v_3, \dots \dots t_n$  with  $v_n$

$d_1(d_2(u'_1, u_2 \dots \dots u_n), v_2, v_3, \dots \dots v_n) u_1 d_1(d_2(u'_1, u_2 \dots \dots u_n), v_2, v_3, \dots \dots v_n) = 0$

By the semiprimeness of  $N$ ,  $d_1(d_2(u'_1, u_2 \dots \dots u_n), v_2, v_3, \dots \dots v_n) = 0$

(v) and (vi)

From (ii) and (iv) we have

$f_2(d_1(t_1, t_2 \dots \dots t_n) t f_2(v_1, v_2, \dots \dots v_n), u_2 \dots \dots u_n) = 0$

$f_2(d_1(t_1, t_2 \dots \dots t_n), u_2 \dots \dots u_n) g_2(\sigma(t f_2(v_1, v_2, \dots \dots v_n))) +$

$\tau(d_1(t_1, t_2 \dots \dots t_n)) d_2(t f_2(v_1, v_2, \dots \dots v_n), u_2 \dots \dots u_n) = 0$

$f_2(d_1(t_1, t_2 \dots \dots t_n), u_2 \dots \dots u_n) g_2(\sigma(t f_2(v_1, v_2, \dots \dots v_n))) = 0$

Replace  $v_1$  with  $d_1(t_1, t_2 \dots \dots t_n)$  and  $v_2$  with  $u_2, v_3$  with  $u_3, \dots \dots v_n$  with  $u_n$

$f_2(d_1(t_1, t_2 \dots \dots t_n), u_2 \dots \dots u_n) g_2(\sigma(t f_2(d_1(t_1, t_2 \dots \dots t_n), u_2 \dots \dots u_n))) = 0$

Since  $g_2$  is onto and  $\sigma$  is an automorphism of  $N$

$f_2(d_1(t_1, t_2 \dots \dots t_n), u_2 \dots \dots u_n) t f_2(d_1(t_1, t_2 \dots \dots t_n), u_2 \dots \dots u_n) = 0$

By the semiprimeness of  $N$ ,  $f_2(d_1(t_1, t_2 \dots \dots t_n), u_2 \dots \dots u_n) = 0$

Similarly if

$d_1(f_2(t_1, t_2 \dots \dots t_n) g_1(\sigma(t d_1(v_1, v_2, \dots \dots v_n), u_2 \dots \dots u_n)) = 0,$

$f_1(d_2(t_1, t_2 \dots \dots t_n) g_1(\sigma(t f_1(v_1, v_2, \dots \dots v_n), u_2 \dots \dots u_n)) = 0,$

$d_2(f_1(t_1, t_2 \dots \dots t_n) g_2(\sigma(t d_2(v_1, v_2, \dots \dots v_n), u_2 \dots \dots u_n)) = 0,$

$f_1(f_2(t_1, t_2 \dots \dots t_n) g_1(\sigma(t f_1(v_1, v_2, \dots \dots v_n), u_2 \dots \dots u_n)) = 0,$

$f_2(f_1(t_1, t_2 \dots \dots t_n) g_2(\sigma(t f_2(v_1, v_2, \dots \dots v_n), u_2 \dots \dots u_n)) = 0,$

$\forall t_1, t_2, \dots, t_n, u_2, \dots, u_n, v_1, v_2, \dots, v_n \in N$ , then we prove

$$d_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0,$$

$$f_1(d_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0,$$

$$d_2(f_1(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0,$$

$$f_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0,$$

$$f_2(f_1(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0, \text{ respectively.} \quad \blacksquare$$

**Theorem 1:** Suppose  $N$  is a 2-torsion free semiprime nearring,  $f_1$  and  $f_2$  are two generalised  $(\sigma, \tau)$  -  $n$  semi derivations of  $N$  then the following conditions are true.

(i)  $f_1$  and  $f_2$  are orthogonal

$$(ii) f_1(t_1, t_2, \dots, t_n)f_2(u_1, u_2, \dots, u_n) = d_1(t_1, t_2, \dots, t_n)f_2(u_1, u_2, \dots, u_n) = 0$$

$$(iii) f_1(t_1, t_2, \dots, t_n)f_2(u_1, u_2, \dots, u_n) = d_1(t_1, t_2, \dots, t_n)d_2(u_1, u_2, \dots, u_n) = 0 \text{ and}$$

$$d_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = d_1(d_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0$$

$$(iv) f_1(f_2(t_1 t'_1, t_2, \dots, t_n), u_2, \dots, u_n) = f_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n)g(\sigma(t'_1)) +$$

$$\tau(t_1)d_1(d_2(t'_1, t_2, \dots, t_n), u_2, \dots, u_n) \text{ and } f_1(t_1, t_2, \dots, t_n)f_2(u_1, u_2, \dots, u_n) = 0$$

**Proof:** By lemma 5 it is enough to prove that (ii)  $\Rightarrow$  (i)

$$f_1(t_1, t_2, \dots, t_n)f_2(u_1, u_2, \dots, u_n) = d_1(t_1, t_2, \dots, t_n)f_2(u_1, u_2, \dots, u_n) = 0$$

$$\text{Replace } t_1 \text{ with } t_1 t'_1 \text{ in } f_1(t_1, t_2, \dots, t_n)f_2(u_1, u_2, \dots, u_n) = 0$$

$$f_1(t_1 t'_1, t_2, \dots, t_n)f_2(u_1, u_2, \dots, u_n) = 0$$

$$(f_1(t_1, t_2, \dots, t_n)g_1(\sigma(t'_1)) + \tau(t_1)d_1(t'_1, t_2, \dots, t_n))f_2(u_1, u_2, \dots, u_n) = 0$$

From lemma 3

$$f_1(t_1, t_2, \dots, t_n)g_1(\sigma(t'_1))f_2(u_1, u_2, \dots, u_n) + \tau(t_1)d_1(t'_1, t_2, \dots, t_n)f_2(u_1, u_2, \dots, u_n) = 0$$

$$f_1(t_1, t_2, \dots, t_n)g_1(\sigma(t'_1))f_2(u_1, u_2, \dots, u_n) = 0$$

Since  $g_1$  is onto and  $\sigma$  is an automorphism of  $N$  and  $t'_1 \in N$

$$f_1(t_1, t_2, \dots, t_n)t'_1 f_2(u_1, u_2, \dots, u_n) = 0$$

Therefore,  $f_1$  and  $f_2$  are orthogonal

Now we prove (iii)  $\Rightarrow$  (i)

$$\text{Since } d_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = d_1(d_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0$$

$$\text{Replace } t_1 \text{ with } t_1 t'_1 \text{ in } d_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0$$

$$d_1(f_2(t_1 t'_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0$$

$$d_1(f_2(t_1, t_2, \dots, t_n)g_2(\sigma(t'_1)), u_2, \dots, u_n) +$$

$$d_1(\tau(t_1)d_2(t'_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0$$

$$d_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n)g_1\left(\sigma\left(g_2(\sigma(t'_1))\right)\right) +$$

$$\tau(f_2(t_1, t_2, \dots, t_n))d_1(g_2(\sigma(t'_1)), u_2, \dots, u_n) +$$

$$d_1(\tau(t_1), u_2, \dots, u_n)g_1\left(\sigma(d_2(t'_1, t_2, \dots, t_n))\right) +$$

$$\tau(\tau(t_1))d_1(d_2(t'_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0$$

$$\text{From (iii) we have } \tau(f_2(t_1, t_2, \dots, t_n))d_1(g_2(\sigma(t'_1)), u_2, \dots, u_n) +$$

$$d_1(\tau(t_1), u_2, \dots, u_n)g_1\left(\sigma(d_2(t'_1, t_2, \dots, t_n))\right) = 0$$

Since  $g_1$  and  $g_2$  are onto and  $\sigma, \tau$  are the automorphisms of  $N$

$$f_2(t_1, t_2, \dots, t_n)d_1(t'_1, u_2, \dots, u_n) + d_1(t_1, u_2, \dots, u_n)d_2(t'_1, t_2, \dots, t_n) = 0$$

From (iii) we get,  $f_2(t_1, t_2 \dots \dots t_n)d_1(t'_1, u_2 \dots \dots u_n) = 0$

Replace  $t'_1$  with  $t'_1v$  where  $v \in N$  in the above equation and using it again

$$f_2(t_1, t_2 \dots \dots t_n)d_1(t'_1v, u_2 \dots \dots u_n) = 0$$

$$f_2(t_1, t_2 \dots \dots t_n)(d_1(t'_1, u_2 \dots \dots u_n)g_1(\sigma(v)) + \tau(t'_1)d_1(v, u_2 \dots \dots u_n)) = 0$$

$$f_2(t_1, t_2 \dots \dots t_n)d_1(t'_1, u_2 \dots \dots u_n)g_1(\sigma(v)) + f_2(t_1, t_2 \dots \dots t_n)\tau(t'_1)d_1(v, u_2 \dots \dots u_n) = 0$$

$$f_2(t_1, t_2 \dots \dots t_n)\tau(t'_1)d_1(v, u_2 \dots \dots u_n) = 0$$

Since  $\tau$  is an automorphism of  $N$ ,  $f_2(t_1, t_2 \dots \dots t_n)t'_1d_1(v, u_2 \dots \dots u_n) = 0$

From lemma 1,  $d_1(v, u_2 \dots \dots u_n)f_2(t_1, t_2 \dots \dots t_n) = 0$

Then (i) can be proved from (ii)

Now we prove (iv)  $\Rightarrow$  (i)

We assume that

$$f_1(f_2(t_1t'_1, t_2, \dots \dots t_n), u_2, \dots \dots u_n) = f_1(f_2(t_1, t_2, \dots \dots t_n), u_2, \dots \dots u_n)g_2(\sigma(t'_1)) + \tau(t_1)d_1(d_2((t'_1, t_2, \dots \dots t_n), u_2, \dots \dots u_n)))$$

And also we have

$$\begin{aligned} f_1(f_2(t_1t'_1, t_2, \dots \dots t_n), u_2, \dots \dots u_n) &= f_1((f_2(t_1, t_2, \dots \dots t_n)g_2(\sigma(t'_1))) + \\ &\tau(t_1)d_2((t'_1, t_2, \dots \dots t_n), u_2, \dots \dots u_n))) \\ &= f_1(f_2(t_1, t_2, \dots \dots t_n)g_2(\sigma(t'_1))) + f_1(\tau(t_1)d_2((t'_1, t_2, \dots \dots t_n), u_2, \dots \dots u_n)) \\ &= f_1(f_2(t_1, t_2, \dots \dots t_n), u_2, \dots \dots u_n)g_1(\sigma(g_2(\sigma(t'_1)))) + \\ &\tau(f_2(t_1, t_2, \dots \dots t_n))d_1(g_2(\sigma(t'_1)), u_2, \dots \dots u_n) + f_1(\tau(t_1), u_2, \dots \dots u_n)g_1(\sigma(d_2(t'_1, t_2, \dots \dots t_n)))) + \\ &\tau(\tau(t_1))d_1(d_2(t'_1, t_2, \dots \dots t_n), u_2, \dots \dots u_n) \end{aligned}$$

Since  $g_1, g_2$  are onto and  $\sigma, \tau$  are automorphisms of  $N$

$$f_1(f_2(t_1t'_1, t_2, \dots \dots t_n), u_2, \dots \dots u_n) = f_1(f_2(t_1, t_2, \dots \dots t_n), u_2, \dots \dots u_n)g_2(\sigma(t'_1)) + f_2(t_1, t_2, \dots \dots t_n)d_1(t'_1, u_2, \dots \dots u_n) + f_1(t_1, u_2, \dots \dots u_n)d_2(t'_1, t_2, \dots \dots t_n) + \tau(t_1)d_1(d_2(t'_1, t_2, \dots \dots t_n), u_2, \dots \dots u_n)$$

From the both expressions of  $f_1(f_2(t_1t'_1, t_2, \dots \dots t_n), u_2, \dots \dots u_n)$  we have

$$f_2(t_1, t_2, \dots \dots t_n)d_1(t'_1, u_2, \dots \dots u_n) + f_1(t_1, u_2, \dots \dots u_n)d_2(t'_1, t_2, \dots \dots t_n) = 0 \quad (7)$$

From the assumption  $f_1(t_1, t_2 \dots \dots t_n)f_2(u_1, u_2 \dots \dots u_n) = 0$

Replace  $u_1$  with  $u_1u'_1$  in the above equation and using it again

$$f_1(t_1, t_2 \dots \dots t_n)f_2(u_1u'_1, u_2 \dots \dots u_n) = 0$$

$$f_1(t_1, t_2 \dots \dots t_n)(f_2(u_1, u_2 \dots \dots u_n)g_2(\sigma(u'_1)) + \tau(u_1)d_2(u'_1, u_2 \dots \dots u_n)) = 0$$

$$f_1(t_1, t_2 \dots \dots t_n)f_2(u_1, u_2 \dots \dots u_n)g_2(\sigma(u'_1)) + f_1(t_1, t_2 \dots \dots t_n)\tau(u_1)d_2(u'_1, u_2 \dots \dots u_n) = 0$$

$$f_1(t_1, t_2 \dots \dots t_n)\tau(u_1)d_2(u'_1, u_2 \dots \dots u_n) = 0$$

Since  $\tau$  is an automorphism of  $N$ ,  $f_1(t_1, t_2 \dots \dots t_n)u_1d_2(u'_1, u_2 \dots \dots u_n) = 0$

From lemma 1,  $f_1(t_1, t_2 \dots \dots t_n)d_2(u'_1, u_2 \dots \dots u_n) = 0$

From equation (7) we have  $f_2(t_1, t_2, \dots \dots t_n)d_1(t'_1, u_2, \dots \dots u_n) = 0$

Put  $t'_1v$  in the place of  $t'_1$  in the above equation and using it again

$$f_2(t_1, t_2, \dots \dots t_n)d_1(t'_1v, u_2, \dots \dots u_n) = 0$$

$$f_2(t_1, t_2, \dots \dots t_n)(d_1(t'_1, u_2, \dots \dots u_n)g_1(\sigma(v)) + \tau(t'_1)d_1(v, u_2, \dots \dots u_n)) = 0$$

$$f_2(t_1, t_2, \dots \dots t_n)d_1(t'_1, u_2, \dots \dots u_n)g_1(\sigma(v)) + f_2(t_1, t_2, \dots \dots t_n)\tau(t'_1)d_1(v, u_2, \dots \dots u_n) = 0$$

$$f_2(t_1, t_2, \dots, t_n)\tau(t'_1)d_1(v, u_2, \dots, u_n) = 0$$

Since  $\tau$  is an automorphism of  $N$ ,  $f_2(t_1, t_2, \dots, t_n)t'_1d_1(v, u_2, \dots, u_n) = 0$

From lemma 1 we have  $d_1(v, u_2, \dots, u_n)f_2(t_1, t_2, \dots, t_n) = 0$

From (ii) we say that  $f_1$  and  $f_2$  are orthogonal. ■

**Theorem 2:** Suppose  $N$  is a 2- torsion free semiprime nearring.  $f_1$  and  $f_2$  are two generalised  $(\sigma, \tau)$  - n semi derivations of  $N$ . If  $f_1, d_2$  are orthogonal and  $f_2, d_1$  are orthogonal then

$$(i) \quad d_1(d_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0 \text{ and } f_1(f_2(t_1t'_1, t_2, \dots, t_n), u_2, \dots, u_n) = f_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n)g_2(\sigma(t'_1)).$$

$$(ii) \quad d_2(d_1(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0 \text{ and } f_2(f_1(t_1t'_1, t_2, \dots, t_n), u_2, \dots, u_n) = f_2(f_1(t_1, t_2, \dots, t_n), u_2, \dots, u_n)g_1(\sigma(t'_1)).$$

**Proof:** (i) Let  $f_1, d_2$  be orthogonal then

$$f_1(t_1, t_2, \dots, t_n)vd_2(u_1, u_2 \dots \dots u_n) = 0 \quad (8)$$

Put  $t'_1t_1$  in the place of  $t_1$

$$f_1(t'_1t_1, t_2, \dots, t_n)vd_2(u_1, u_2 \dots \dots u_n) = 0$$

$$(f_1(t'_1, t_2, \dots, t_n)g_1(\sigma(t_1)) + \tau(t'_1)d_1(t_1, t_2, \dots, t_n))vd_2(u_1, u_2 \dots \dots u_n) = 0$$

From lemma 3

$$f_1(t'_1, t_2, \dots, t_n)g_1(\sigma(t_1))vd_2(u_1, u_2 \dots \dots u_n) + \tau(t'_1)d_1(t_1, t_2, \dots, t_n)vd_2(u_1, u_2 \dots \dots u_n) = 0$$

Since  $g_1$  is onto and  $\sigma$  is an automorphism of  $N$ ,  $t_1, v \in N$  and also from equation (8) we have

$$\tau(t'_1)d_1(t_1, t_2, \dots, t_n)vd_2(u_1, u_2 \dots \dots u_n) = 0$$

Since  $\tau$  is an automorphism of  $N$  and  $t'_1 \in N$

$$Nd_1(t_1, t_2, \dots, t_n)vd_2(u_1, u_2 \dots \dots u_n) = 0$$

From the semiprimeness of  $N$ ,

$$d_1(t_1, t_2, \dots, t_n)vd_2(u_1, u_2 \dots \dots u_n) = 0$$

Therefore,  $d_1$  and  $d_2$  are orthogonal

From lemma 5 (iv)

$$d_1(d_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n) = 0 \quad (9)$$

Since  $f_1, d_2$  are orthogonal and  $f_2, d_1$  are orthogonal and by lemma 1

$$f_1(t_1, t_2, \dots, t_n)d_2(u_1, u_2 \dots \dots u_n) = 0 \quad (10)$$

$$f_2(t_1, t_2, \dots, t_n)d_1(u_1, u_2 \dots \dots u_n) = 0 \quad (11)$$

$$\text{Now } f_1(f_2(t_1t'_1, t_2, \dots, t_n), u_2, \dots, u_n) = f_1(f_2(t_1, t_2, \dots, t_n)g_2(\sigma(t'_1)) +$$

$$\tau(t_1)d_2(t'_1, t_2, \dots, t_n), u_2, \dots, u_n)$$

$$= f_1(f_2(t_1, t_2, \dots, t_n)g_2(\sigma(t'_1)), u_2, \dots, u_n) + f_1(\tau(t_1)d_2(t'_1, t_2, \dots, t_n), u_2, \dots, u_n)$$

$$= f_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n)g_1(\sigma(g_2(\sigma(t'_1)))) +$$

$$\tau(f_2(t_1, t_2, \dots, t_n))d_1(g_2(\sigma(t'_1)), u_2, \dots, u_n) +$$

$$f_1(\tau(t_1), u_2, \dots, u_n)g_1(\sigma(d_2(t'_1, t_2, \dots, t_n), u_2, \dots, u_n)) + \tau(\tau(t_1))d_1(d_2(t'_1, t_2, \dots, t_n), u_2, \dots, u_n)$$

Since  $g_1, g_2$  are onto and  $\sigma, \tau$  are the automorphisms of  $N$

$$f_1(f_2(t_1t'_1, t_2, \dots, t_n), u_2, \dots, u_n) = f_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n)g(\sigma(t'_1)) +$$

$$f_2(t_1, t_2, \dots, t_n)d_1(t'_1, u_2, \dots, u_n) + f_1(t_1, u_2, \dots, u_n)(d_2(t'_1, t_2, \dots, t_n), u_2, \dots, u_n) +$$

$$t_1d_1(d_2(t'_1, t_2, \dots, t_n), u_2, \dots, u_n)$$

Now from equations (9), (10), (11)

$$f_1(f_2(t_1 t'_1, t_2, \dots, t_n), u_2, \dots, u_n) = f_1(f_2(t_1, t_2, \dots, t_n), u_2, \dots, u_n)g_2(\sigma(t'_1)),$$

$$\forall t_1, t_2, \dots, t_n, u_2, \dots, u_n \in N$$

(ii) can be proved in the similar manner of proof of (i). ■

**Theorem 3:** Suppose N is a 2- torsion free semiprime nearring. If f is a generalised  $(\sigma, \tau)$  - n semi derivation of N. If  $f(t_1, t_2, \dots, t_n)f(u_1, u_2, \dots, u_n) = 0$  then  $f = d = 0$

**Proof:** Given that  $f(t_1, t_2, \dots, t_n)f(u_1, u_2, \dots, u_n) = 0$  (12)

Replace  $u_1 u'_1$  in the place of  $u_1$  in the above equation and using it again

$$f(t_1, t_2, \dots, t_n)f(u_1 u'_1, u_2, \dots, u_n) = 0$$

$$f(t_1, t_2, \dots, t_n)(f(u_1, u_2, \dots, u_n)g(\sigma(u'_1)) + \tau(u_1)d(u'_1, u_2, \dots, u_n)) = 0$$

$$f(t_1, t_2, \dots, t_n)f(u_1, u_2, \dots, u_n)g(\sigma(u'_1)) + f(t_1, t_2, \dots, t_n)\tau(u_1)d(u'_1, u_2, \dots, u_n) = 0$$

From equation (12)

$$f(t_1, t_2, \dots, t_n)\tau(u_1)d(u'_1, u_2, \dots, u_n) = 0$$

$$\text{Since } \tau \text{ is an automorphism of N, } f(t_1, t_2, \dots, t_n)u_1 d(u'_1, u_2, \dots, u_n) = 0$$

By lemma 1

$$d(u'_1, u_2, \dots, u_n)f(t_1, t_2, \dots, t_n) = 0 \quad (13)$$

Replace  $t_1 u'_1$  in the place of  $t_1$  in the above equation and using it again

$$d(u'_1, u_2, \dots, u_n)f(t_1 u'_1, t_2, \dots, t_n) = 0$$

$$d(u'_1, u_2, \dots, u_n)(f(t_1, t_2, \dots, t_n)g(\sigma(u'_1)) + \tau(t_1)d(u'_1, t_2, \dots, t_n)) = 0$$

$$d(u'_1, u_2, \dots, u_n)f(t_1, t_2, \dots, t_n)g(\sigma(u'_1)) + d(u'_1, u_2, \dots, u_n)\tau(t_1)d(u'_1, t_2, \dots, t_n) = 0$$

From equation (13) we have

$$d(u'_1, u_2, \dots, u_n)\tau(t_1)d(u'_1, t_2, \dots, t_n) = 0$$

Since  $\tau$  is an automorphism of N,

$$d(u'_1, u_2, \dots, u_n)t_1 d(u'_1, t_2, \dots, t_n) = 0$$

In particular  $d(u'_1, u_2, \dots, u_n)t_1 d(u'_1, u_2, \dots, u_n) = 0$

By the semiprimeness of N we have  $d = 0$

Given that  $f(t_1, t_2, \dots, t_n)f(u_1, u_2, \dots, u_n) = 0$

Put  $t_1 u$  in the place of  $t_1$

$$f(t_1 u, t_2, \dots, t_n)f(u_1, u_2, \dots, u_n) = 0$$

$$(f(t_1, t_2, \dots, t_n)g(\sigma(u)) + \tau(t_1)d(u, t_2, \dots, t_n))f(u_1, u_2, \dots, u_n) = 0$$

From lemma 3

$$f(t_1, t_2, \dots, t_n)g(\sigma(u))f(u_1, u_2, \dots, u_n) +$$

$$\tau(t_1)d(u, t_2, \dots, t_n)f(u_1, u_2, \dots, u_n) = 0$$

From equation (13)

$$f(t_1, t_2, \dots, t_n)g(\sigma(u))f(u_1, u_2, \dots, u_n) = 0$$

Since g is onto and  $\sigma$  is an automorphism of N,  $f(t_1, t_2, \dots, t_n)uf(u_1, u_2, \dots, u_n) = 0$

In particular  $f(t_1, t_2, \dots, t_n)uf(t_1, t_2, \dots, t_n) = 0$

By the semiprimeness of N,  $f = 0$ . ■

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## CHAPTER 5

### A SUCCESSFUL CASE STUDY OF STHOULYA VYADHI WITH SPECIAL REFERENCE TO OBESITY

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#### ABSTRACT

Sthoulya vyadhi has been mentioned by Acharya Charaka in Ashtaunindita purushadhyaya. Sthoulya is the abnormal and excess accumulation of Medodhatu. Fat symptoms like heaviness and bulkiness of the body due to extreme growth especially in Udaradi (Abdomen) region is termed as “Sthula” and the state (Bhava) of Sthula is called as “Sthaulya”. Charaka has mentioned the Beejadosha Swabhavata as one of the important etiological factors besides other for the disease. In modern science it is compared with obesity. Obesity is defined as excess of body fat that poses a health risk. Rapid urbanization and stress, westernization in food and sedentary life style has made Indians to suffer from obesity. Obesity is more common in both developing and developed countries worldwide. Prestige of social drinking in society, improper food habits etc are also attracting and pushing people into scales of overweight and obese category. The Ayurvedic approach is perfect answer to overweight because ayurveda does not recommend weight losing pills or fast weight loss programs. In the field of Ayurveda it is experienced that ‘Shodhan Chikitsa’ is effective in Sthoulyavyadhi. While considering day-to-day life and available time factor of patient, ‘Shaman Chikitsa’ is preferable. Ayurveda has laid emphasis on the holistic solutions that allows the people to loose excess weight and keep it off by specific dietary measures and life style measure. Here in the case study a female patient of age 47 years presenting with clinical features of Sthaulya and was treated with Navak Guggulu and Udvavrtana got relief within 30 days.

#### INTRODUCTION

**S**thoulya is explained as santharpanottha vyadhi in Ayurveda. Atisthula is one among the ashtanindithapurushas . Sthoulya is a condition wherein there will be ayatopachaya of shareera associated with the abnormal increase in medodhatu. CharakaSamhita gives one of the best definition of sthoulya as'-The increase of the medo and mamsadhatu causes the flabbiness and thus movement of abdomen, buttocks and breasts. This improperly formed medodhatu causes utsahahani in the individual; such person is called Atisthula. In the western medical science, Sthoulya can be compared with Obesity; Obesity is the abnormal

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growth of the adipose tissue due to an enlargement of fat cell size or an increase in fat cell number or a combination of both.

The conventional concept of etiopathogenesis, prognosis and management of obesity is very similar and equally advanced to the medoroga/sthoulya of ayurveda , which was conceived in 1500BC by Acharya Charaka. Overweight or obesity is mostly found in people with Kapha type constitutions. Obesity occurs when fat builds up in the adipose tissues. Diseases like coronary thrombosis, Diabetes (T2DM), Heart disease (CHD), Stroke, Hyper tension, cholesterol and some type of cancers are health risks associated with the Sthoulya.

Rapid urbanization and stress, westernization in food and sedentary life style has made Indians to suffer from obesity. Obesity is more common in both developing and developed countries worldwide. Prestige of social drinking in society, improper food habits etc are also attracting and pushing people into scales of overweight and obese category. Obesity is a complex multifactorial chronic disease developing from interactive influence of numerous factors like social, behavioural, psychological, cellular & genetic factors. It is widely regarded as pandemic with potentially disastrous consequences for human health.

India saw significant rise in obesity from its 19<sup>th</sup> position for both men and women in 1975 to rankings 5<sup>th</sup> and 3<sup>rd</sup> respectively in 2016 reflecting increasing obesity trend amongst women worldwide. No wonder that the world health organization has concluded that obesity is the major unmet public health problem worldwide. Obesity is health hazard and detriment to well-being which is reflected in the increased mortality.

In the field of Ayurveda it is experienced that ‘Shodhan Chikitsa’ is effective in Sthoulyavyadhi. While considering day-to-day life and available time factor of patient, ‘Shaman Chikitsa’ is preferable. Ayurveda has laid emphasis on the holistic solutions that allows the people to loose excess weight and keep it off by specific dietary measures and life style measures.

A present article about a case study of a female patient of Sthoulya was treated with Navak Guggulu and Udvartana got relief within 30 days.

## CASE REPORT

### History of personal illness

. A 47-year-old female patient came to opd with chief complaint of –

**Table 1:** Showing symptoms & duration of patient

Sr.No	Chief Complaints	Duration
1	Bharvruddhi(Increase in weight )	3 months
2	Kshudrashwas (difficulty in respiration)	15 days
3	Trushna (thrust)	3 month
4	Daurbalya (genral weakness)	3 month
5	Kshudha	3month

### History of past illness

Patient was not a known case of Diabetes mellitus ,hypertension, hypothyroidism, PCOS. No any history of any drug allergy. Hysterectomy done before one year.

### History of personal illness

47 years female patient came to Opd having complaint of weight gain, kshudrashwas (difficulty in respiration), trushna, dourbalya. She had taken treatment but didn't get any relief so she visited to our hospital.

### ASTAVIDHA PARIKSHA

- |                                       |                             |
|---------------------------------------|-----------------------------|
| 1) Nadi (pulse) - 78/min.             | 2) Mala - Asamyak pravrutti |
| 3) Mutra (urine) - 5-6 times in a day | 4) Jeevha - Niraam          |
| 5) Shabda - Spashta                   | 6) Sparsh - Anushna shit    |
| 7) Druk - Prakrut                     | 8) Akriti - sthula.         |

### Genral examination

- |                                |                          |
|--------------------------------|--------------------------|
| Pulse- 78/min                  | Temperature – 96.7 F     |
| Blood Pressure - 140/90 mm/Hg. | Respiration rate- 22/min |
| Hight- 155 cm                  | Weight – 79kg            |

### Dashavidha pariksha

- 1) Prakruti – Vatkaphj
- 2) Vikruti – medodhatu drushti
- 3) Sara – Medosara
- 4) Samhanana – Pravara
- 5) Pramana – Adhik
- 6) Satmya – Sarv rasatmaka Ahara
- 7) Satva – Pravara
- 8) Aharashakti – Madhyama
- 9) Vyayamashakti – Madhyama
- 10) Vaya- Madhyama

### Srotas parikshan

- 1) Pranavaha: - Nasa /Hridaya/Phupphusa/Mahasrotas - prakrut
- 2) Annavaha: - Jivha Danta DantamoolVamparshwa Aamashaya- prakrut
- 3) Udakvaha: - TaluKloma- prakrut
- 4) Rasavaha: - HridayaNadiDashdhamanya- prakrut
- 5) Raktavaha: - Yakrit PleehaRaktavahi dhamanya- prakrut
- 6) Mansavaha: - SnayuTwak- prakrut
- 7) Medovaha: - Vrukka - prakrut , Vapavahan – vrudhi ,Sphika – vrudhi
- 8) Asthivaha: - Medodhatu – vrudhi ,Jaghana – vrudhi ,Danta - prakrut
- 9) Majjavaha: - AsthiSandhi- Prakrut
- 10) Shukravaha: - Medhra/Vrishan Stana-stana lambanam
- 11) Artava & Rajovaha: - Tryavarta Yoni-prakrut
- 12) Mutravaha: - VrukkaBastiGavinee- prakrut
- 13) Purishavaha: - Pakwashya Guda- prakrut
- 14) Swedavaha: - Meda Lomakupa-Aati-sweda
- 15) Manovaha: - Nidra Smriti - prakrut

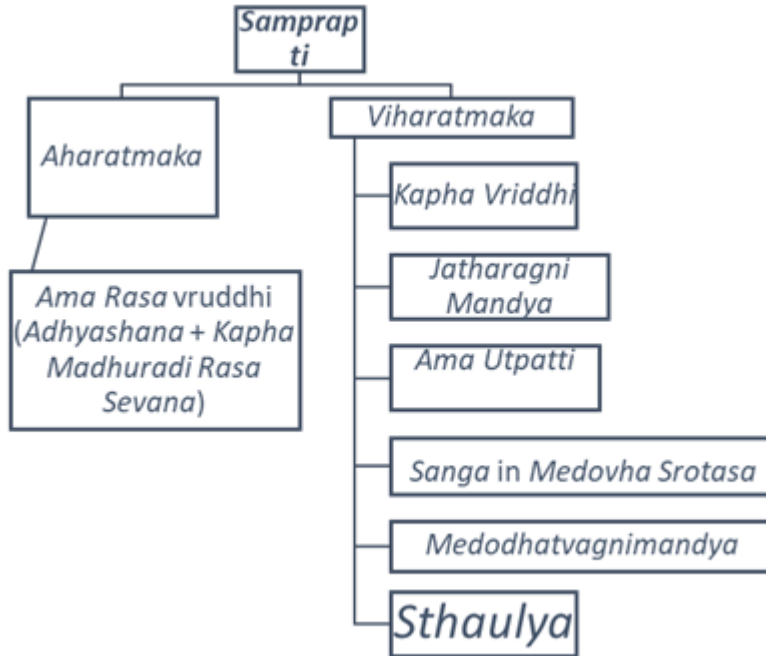
**Hetu sevana**

1) **Aharatmak** – Excessive consuming Madhura aharsevan (sweet food), Snigdha aharsevan (excessive oily food), Guru aharsevan (Heavy food) like Non veg eating chicken, Motton etc.

2) **Viharatmak** –Diwaswap(sleeping at day time),Avyayam(no excersise),sedentary life style.

3) **Mansik**-Harshanityavat, Achintan, Mansonivrti.

**Samprapti**



**SAMPRAPTI GHATAKA**

The following factors play a major role in Samprapti of Sthaulya.

**Dosha:** - Kapha – Kledaka

Vata – Samana, Vyana

Pitta – Pachaka

**Dushya:** - Meda, Rasa Dhatu

**Strotas:-** MedovahaStrotas ,RasavahaStrotas

**Strotodusti:-** Margavarodha ,Sanga ,Amatah

**Agni** -Jatharagni, Rasa and Meda Dhatvagni,Parthiva, Apya Bhutagni

**Udbhavasthana:** Amashaya

**Roga Marga:** Bahya

**Prasara:** Rasayani

**Ama :**Dhatvagni Mandyajanit Ama, Jatharagni Mandyajanit Ama

**Adhishsthana:** Whole Body (Particularly Vapavahana and Medodhara Kala)

**MATERIALS AND METHODS****METHODS**

**Centre of study:** O.P. D & I.P.D of Kayachikitsa dept. of D.Y.Patil school of Ayurvedic hospital, Navi Mumbai.

**Method of sampling & study design:** Simple Clinical Single case study.

**MATERIALS****Shamana aushadi and Udavartana treatment given to the patient****Preparation of medicine:**

The Navak guggulu, powder for Udavartana (Shailayadi churna, B.P.) etc. were prepared in pharmacy of D.Y.Patil school of Ayurveda, Navi Mumbai.

The reference of Navak guggulu is taken from Cakradutta 36/18.

For its preparation the raw materials were collected from APMC Pharmacy, Vashi. The equal amount of amalaki, haritaki, vibhitak, mustak, vidanga, chitrak-mula, shunthi, marich and pippali were taken and grinded well in to a fine powder. Pure guggulu is taken into amount equal to total grinded powder, and allowed to heat. After cooling of fully melted guggulu the whole powders has been mixed, allowed to kuttan. Finally the vatics (tablets) were prepared each of 250 gm.

The reference of Shailayadi powder for Udavartana has been taken from BhavPrakash (madhyam khand 39/28). For the preparation of it, the raw material is taken from APMC Pharmacy, Vashi. Shailay, Kusth, Agaru, Devdaru, Renuka seed, Mustak, Saral kash, Lata kasturi, Tulsi manjari, Lavang, Amra patra, Jamun patra, Bijora nimbu patra, Bilva patra etc. were taken in to equal amount and grinded well. It is again and again filtered to turn into finest powder as to be used for Udavartana.

**DRUG, DOSAGE & DURATION**

**Navak guggulu** - 500 mg twice a day with lukewarm water before meal for the duration of 30 days.

**Udvardan** - The patient is massaged by dry udvardan therapy by shailayadi churna given for 45 minutes each day till 21 days, empty stomach.

**OBSERVATION AND RESULTS**

After the treatment of 30 days, there was significant decrease in sign and symptoms of Sthaulya Clinical examination of the patients revealed regression of

- Bharvruddhi less
- No Kshudrashwas
- No Trushna
- No Daurbalya
- Kshudha less

**Criteria for assessment****Table 2. Subjective criteria**

Lakshanas	0 day	7th day	15th day	30th day
1) Bharvruddhi	+++	++	+	+
2) Kshudrashwas	++	+	+	-

3) Trushna	+++	++	+	-
4)Daurbalya	+++	++	+	-
5)Kshudha	++	+	+	+

**Table 3. Objective Criteria**

Parameters	0 day	7th day	15th day	30th day
1) Body Weight	79kg	78 kg	73 kg	72 kg
2) Body Mass Index	32.9	32.5	30.4	30.0
3) Waist to Hip ratio	107/113	106.5/112	106/112	105/110
4) Skin fold Thickness	4 cm	4 cm	3.5 cm	3.5 cm
5) Mid Arm circumference	39 cm	38 cm	38 cm	37.5 cm
6) Chest circumference	98 cm	97cm	97cm	96.5cm
7) Abdominal Girth	105cm	104cm	104cm	103.5cm
8) Thigh circumference	64cm	63cm	63cm	62.5cm

**DISCUSSION**

The effect of Navak guggulu, and Udvartana were very encouraging in reduction of weight, B.M.I. and body circumferences. Navak guggulu corrects the Medo-dhatvagnimandya and checks the process of Medovridhi. In Navaka Guggulu maximum ingredient have Katu Rasa, Laghu- Ruksha Guna, Ushna-Virya and Katu-Vipaka, Vata-kapha-shamaka, Karshana, Lekhaniya, Medorogahara, Amapachana,& Dhatu-shoshana properties, which normalize the state of Agni. Thus regulated Jatharagni, checks the excessive growth and accumulation of Medodhatu.

In Udvartana, due to increased friction to all parts of the body, the increased meda is depleted and the increased ushma /heat generated during Udvartana digested the Ama thus corrected the Agnimandhya which causes obesity. The properties of drugs of Shailayadi churn are ruksh, ushn and shukshm. By virtues of it, it helps in reducing the excess meda and kleda, and reaches to cellular level to correct the agnimandhya. Scientifically it could be assumed that due to increased friction to all parts of the body, the beta-3 receptor present in the adipose tissue of subcutaneous fat are stimulated, so the triglyceride present in the subcutaneous tissue will break down into fatty acids. These fatty acids are carried out to liver due to the effect of centripetal massage, which increases the circulation to the internal organ for the conversion of fatty acid into bile. As less caloric food is supplied along with heavy exercises, the body needs more energy to meet the same. In the absence of carbohydrate fats are utilized for the purpose of energy production. The bile that is formed in liver, is being expelled out through faeces. Hence the reabsorption of the bile will be decreased, inturn utilizing the lipid, which is circulated through the blood. Promotion of excretion of bile in the faeces is used as one of the treatment principle to treat hyperlipidemia.

**CONCLUSION**

The conclusion of the present study was that Navak guggulu group, and DryUdvartana proved to be efficacious in the disease obesity. Navak guggulu, and Udvartana provided good result in almost all the parameters because they eliminates Doshas from the body and simultaneously perform the action of Samprapti Vighatana at cellular level.

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## CHAPTER 6

### ECOLOGICAL RESILIENCE & ECOLOGICAL SUSTAINABILITY

**Dr. Avadhesh Kumar Koshal <sup>1</sup>**

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#### **Ecology & Environment**

The environments interrelationships are between biotic and abiotic components. The abiotic components provide indirect and direct support to life. The life without abiotic support biotic components never survives. The biotic components of environment are a best component of nature. The flora and fauna so much differentiation is available in nature. The biodiversity are available everywhere its means hilly area, plain area sandy area even in water area. The maximum differentiations are available in this area. The micros to macro environment mega diversity are present. The Ecological means the patterns of relationships between living things and their environment. The two components are organism & their environment for nature. The studying a food chain in forest area gives forest ecology while the study of honeybees are interact with their habitat brings about niche construction ecology. Simply say the environment is defined as the relationship of components present in the surroundings, whereas ecology is defined as the study of the relationship between organisms and their environment. The different levels of ecology include- organisms, communities, population and ecosystem. Ecology is the study of the relationships between living organisms, including humans, and their physical environment. Ecology considers organisms at the individual, population, community, ecosystems, and biosphere level. Simply can say **Ecology** is the study of the relationships between living organisms and their physical environment. First time, in 1859, French Zoologist, Isodore Geoffroy St. Hilaire proposed term “Ethology”. At about the same time the English naturalist, St. George Jackson Mivart coined the term “Hexicology”. Kormondy (1969) tried to give credit for the first use of the term ecology to Henry David Thoreau in 1858. There are, however, references in literature in favour of German biologist Reiter used the term Ecology for first time in 1868. Later the word ecology was coined by the German zoologist Ernst Haeckel *in* 1866, who applied the term oekologie to the “relation of the animal both to its organic as well as its inorganic environment.” The word comes from the Greek oikos, meaning “household,” “home,” or “place to live” and it became a rigorous science in the late 19th century. Ecology as a distinct discipline grew out of natural history early in this century as natural historians began to collect their observations into a body of theory. The resilience or robustness of ecological systems has been an important concept in ecology and natural history since the time of British naturalist Charles Darwin, who described the interdependencies between species as an “entangled bank” in his influential work *on the Origin of Species* (1859), before the term ecology was coined it contained many seeds that could grow to dominate modern ecology, Ecology has been defined in various ways by different authors. Warming (1895, 1905), who actually employed this science for the study of plants, defined oekologie as "the study of organisms in relation to their environment". American ecologist F. Clements (1916) considered ecology to be "the science of the community, whereas British ecologist Charles Elton (1927) defined ecology as "scientific, natural history" concerned with the "sociology and

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economics of animals. Woodbury (1954) said “a science which investigates organisms in relation to their environment. Taylor (1936) defined ecology as "the science of the relations of all organisms to all their environments”. Andrewartha (1961), Petrides (1968) and Krebs (1972) defined it as "the scientific approach to the study of environmental interactions”. Haeckel given definition of ecology, he refers to the "surrounding outer world", which we now call the environment of an organism. His "organic and inorganic conditions", we call biotic and abiotic environmental factors, respectively. Odum (1963, 1969, 1971) with such an approach put forth a new definition of ecology, "As you know ecology is often defined as the study of interrelationships between organisms and environment. The concept of triangle of nature is given by Father of India Ecology Prof. R. Misra (1967). He defined ecology as "interactions of form, functions and factors." These three interacting aspects i.e. form, function and factors integrate together to construct the triangle of nature. Krebs (1985) defined ecology in simple modern comprehensive way as ecology is the scientific study of the interactions that determine the distribution and abundance of organisms. The ecological resilience ( ecological robustness), the ability of an ecosystem to maintain its normal patterns of nutrient cycling and biomass production after being subjected to damage caused by an ecological disturbance.

### **Ecological resilience**

**T**he term *resilience* is a term that is sometimes used interchangeably with *robustness* to describe the ability of a system to continue functioning amid and recover from a disturbance. Holling (1973) introduced the word resilience into the ecological literature as a way of helping to understand the non-linear dynamics observed in ecosystems. Ecological resilience was defined as the amount of disturbance that an ecosystem could withstand without changing self-organized processes and structures. Resilience has been defined in two ways in ecological literature:

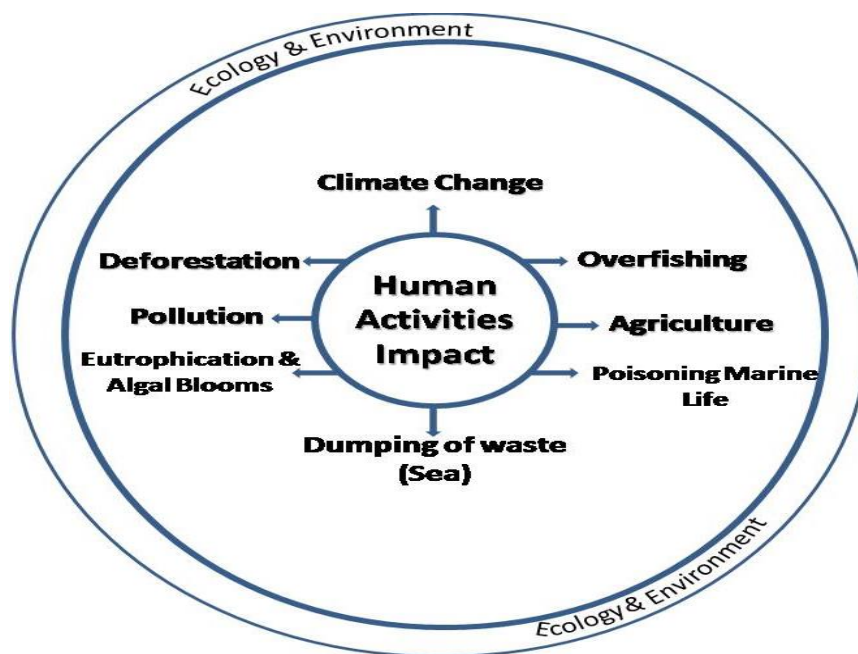
1. as the time required for an ecosystem to return to an equilibrium or steady-state following a perturbation
2. as "the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks" Walker et al. (2004).

The second definition has been termed ‘ecological resilience’, and it presumes the existence of multiple stable states or regimes Gunderson (2000).

Climate is the description of the long-term pattern of weather in a particular area. The climate does not change for longer periods. Climate is the average conditions that are expected at a certain place over a number of years. For example, it may expect snow in the Northeast in January or for it to be hot and humid in the Southeast in July. The climate record also includes extreme values such as record high temperatures or record amounts of rainfall. The earth has three main types of climate zones: Tropical, Temperate, & Polar. Resilience refers to ecosystem's stability and capability of tolerating disturbance and restoring itself. If the disturbance is of sufficient magnitude or duration, a threshold may be reached where the ecosystem undergoes a regime shift, possibly permanently.

### **Human activities**

There are many areas where human activity impacts upon and is also dependent upon the resilience of terrestrial, aquatic and marine ecosystems. These include agriculture, overfishing, dumping of waste into the sea, climate change, deforestation, pollution, mining & recreation.



### Agriculture

Agriculture can be seen as a significant example which the resilience of terrestrial ecosystems should be considered Tilman (1999). The organic matter (elements carbon and nitrogen) in soil, which is supposed to be recharged by multiple plants, is the main source of nutrients for crop growth.

The agricultural intensification and the application of herbicides to control weeds, fertilisers to accelerate and increase crop growth and pesticides to control insects, plant biodiversity is reduced as is the supply of organic matter to replenish soil nutrients and prevent surface runoff. Modern agriculture, food production and distribution are major contributors of greenhouse gases: Agriculture is directly responsible for 14 % of total greenhouse gas emissions. Paddy rice fields are a large source of GHG emissions. Estimates of global methane (CH<sub>4</sub>) emissions from paddy soils range from 31 to 112 Tg year<sup>-1</sup> (up to 19% of total emissions). The 11% of global agricultural nitrous oxide (N<sub>2</sub>O) emissions come from rice fields (US-EPA., 2006 & Pachauri, & Reisinger 2007).

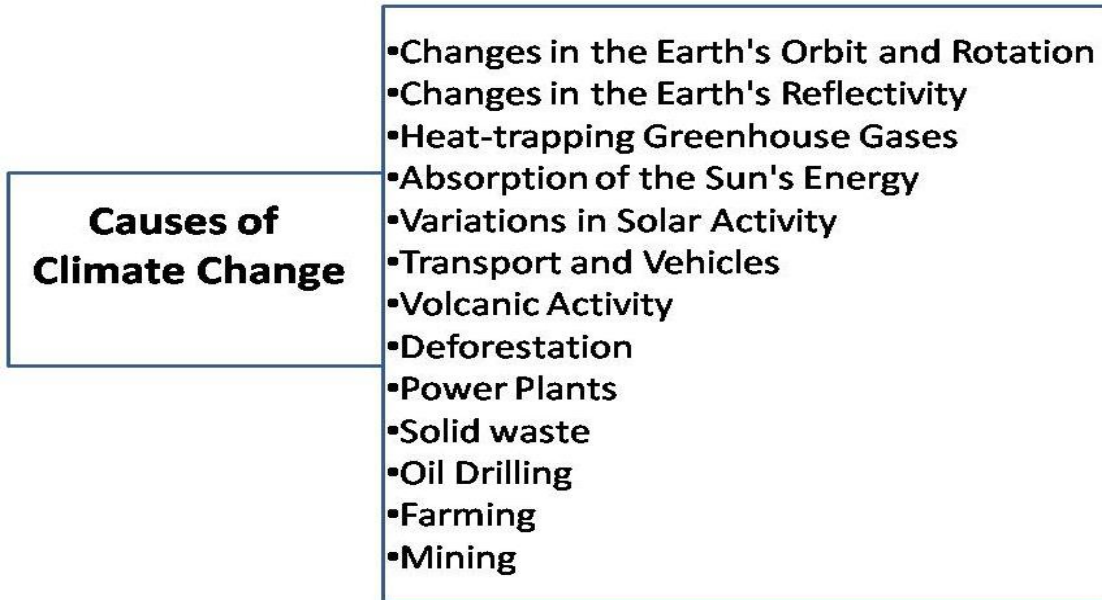
India emits about 3 gigatonnes (Gt) CO<sub>2</sub>eq of greenhouse gases each year; about two and a half tons per person, which is less than the world average. The country emits 7% of global emissions, despite having 17% of the world population. India emitted 2,299 million tonnes of carbon dioxide (CO<sub>2</sub>) in 2018 (<https://www.downtoearth.org.in>), according to a report by the International Energy Agency. India's farm sector accounts for 14% of the country's total greenhouse gas emissions ([www.hindustantimes.com](http://www.hindustantimes.com)), India's total GHG emissions in 2014 were 3,202 million metric tons of carbon dioxide equivalent (MtCO<sub>2</sub>e), totaling 6.55% of global GHG emissions. In India, 68.7% percent of GHG emissions come from the energy sector, followed by agriculture, industrial processes, land-use change and forestry, and waste which contribute 19.6 percent, 6.0 percent, 3.8 and 1.9 percent relatively to GHG emissions. India's GDP increased 357% from 1990 to 2014, while GHG emissions increased 180%. Relative to GDP, India emits twice as many GHGs as the world average. Annual average temperature over the contiguous United States has increased by 1.2°F (0.7°C) over the last few decades and by 1.8°F (1.0°C) relative to the beginning of the last century (<https://www.ers.usda.gov/topics/natural-resources-environment/climate-change/>).

### **Deforestation**

Today, only 4 billion hectares are left. The world has lost one-third of its forest – an area twice the size of the United States. Only 10% of this was lost in the first half of this period, until 5,000 years ago. In India, the forest resources have been found to be depleting at a pace which is much high (Kumari, 2020). In the last two years, India's forest and tree cover has risen marginally, but its most densely populated forests — in the Northeast region — saw the most deforestation, according to the India State of Forest Report, 2021. India's total tree and forest cover rose by 2,261 sq. India had 31.3Mha of natural forest, extending over 11% of its land area. In 2020, it lost 132kha of natural forest, equivalent to 67.3Mt of CO<sub>2</sub> of emissions (<https://www.globalforestwatch.org/dashboards/>). The term deforestation has a meaning that covers crossing the threshold of forest's resilience and losing its ability to return its originally stable state. Deforestation or forest clearance is the removal of a forest or stand of trees from land that is then converted to non-forest use Davis & Holmgren (2000). Deforestation can involve conversion of forest land to farms, ranches, or urban use. Human-driven and natural loss of trees-deforestation- affects wildlife, ecosystems, weather patterns, and even the climate. After oceans, forests are the largest storehouses of carbon. But we're losing forests at an alarming rate. Two-thirds of global forest cover loss is occurring Deforestation also decreases biodiversity of both plant and animal life and can lead to an alteration of the climatic conditions of an entire area ([https://wwf.panda.org/discover/our\\_focus/forests\\_practice/deforestation\\_fronts\\_/](https://wwf.panda.org/discover/our_focus/forests_practice/deforestation_fronts_/)). Deforestation can also lead to species extinction, which can have a domino effect particularly when keystone species are removed (Peterson et. al.1998 & Naik, 2010) or when a significant number of species is removed and their ecological function is lost ([https://en.wikipedia.org/wiki/Ecological\\_resilience](https://en.wikipedia.org/wiki/Ecological_resilience)). To recover itself, a forest ecosystem needs suitable interactions among climate conditions and bio-actions, and enough area. In addition, generally, the resilience of a forest system allows recovery from a relatively small scale of damage . The larger the scale of damage, the more difficult it is for the forest ecosystem to restore and maintain its balance.

### **Climate change**

Climate change refers to long-term shifts in temperatures and weather patterns. The long-term effects of climate change include further ice melt, ocean warming, sea level rise, and ocean acidification. Today increased use of fossil fuels – such as coal, oil and gas to generate electricity, run cars and other forms of transport, and power manufacturing and industry. Deforestation – because living trees absorb and store carbon dioxide. The key focus of increasing climate resilience is to reduce the climate vulnerability that communities, states, and countries currently have with regards to the many effects of climate change. Currently, climate resilience efforts encompass social, economic, technological, and political strategies that are being implemented at all scales of society (Pörtner *et al.* 2022).



Current time climate changing going to fast rate everywhere means abiotic and biotic components. It is not good sign for sustainability. Deforestation is the clearance of woodland and forest; this is either done for the wood or to create space for farms. Oil & Gas. Oil and Gas is used all the time in almost every industry. the world feels the effects of climate change, the most vulnerable are people living in the world's poorest countries, like Haiti and Timor-Leste, who have limited financial resources to cope with disasters, as well as the world's 2.5 billion smallholder farmers, herders and fisheries who depend. As per scientist information, Kiribati Country will sink first that will be swallowed up by the sea as a result of climate change. The impacts of climate change include warming temperatures, changes in precipitation, and increases in the frequency or intensity of some extreme weather events, and rising sea levels. These impacts threaten our health by affecting the food we eat, the water we drink, the air we breathe, and the weather we experience. It's important that the climate is changing, so that we can prepare for the future.

### **Overfishing**

It has been estimated by the United Nations Food and Agriculture Organisation that over 70% of the world's fish stocks are either fully exploited or depleted which means overfishing threatens marine ecosystem resilience and this is mostly by rapid growth of fishing technology. One of the negative effects on marine ecosystems is that over the last half-century the stocks of coastal fish have had a huge reduction as a result of overfishing for its economic benefits Peruvian Anchovy Case.(2012). Due to too much fishing activity the Blue Fin Tuna is at particular risk of extinction and also deplete key reef species and damage coral habitat (<https://www.worldwildlife.org/species/bluefin-tuna>). Overfishing is catching too many fish at once, so the breeding population becomes too depleted to recover. Overfishing often goes hand in hand with wasteful types of commercial fishing that haul in massive amounts of unwanted fish or other animals, which are then discarded (<https://www.worldwildlife.org/threats/overfishing>).

The main causes of overfishing, increasing human demand, subsidies, poor management of fisheries, and lack of protective regulations are the biggest drivers.

A fishing ban could help bolster populations of the fish needed to clean away this suffocating slime. Cleaning up coral reefs could also ensure that they remain tourism destinations for years to come, supplying local communities with precious income. The number of overfished stocks globally has tripled in half a

century and today fully one-third of the world's assessed fisheries are currently pushed beyond their biological limits, according to the Food and Agriculture Organization of the United Nations. Overfishing is closely tied to bycatch - the capture of unwanted sea life while fishing for a different species (<https://www.worldwildlife.org/threats/overfishing>). This, too, is a serious marine threat that causes the needless loss of billions of fish, along with hundreds of thousands of sea turtles and cetaceans (<https://www.frontiersin.org/articles/10.3389/fmars.2020.00317/full>). Overfishing can impact entire ecosystems. It can change the size of fish remaining, as well as how they reproduce and the speed at which they mature. Demands for fish continues to increase around the world, and that means more businesses and jobs are dependent on dwindling stocks. Fish ranks as one of the most highly traded food commodities and fuels a \$362 billion global industry. Some of the world's richest nations continue to pay billions to keep lagging fishing industries afloat through fishing subsidies. The US imports 90% of its seafood, making it the largest single country importer of fish. WWF works with 40 corporate partners in North America that source from more than 550 different fisheries.

### **Effects of Overfishing**

- **Imbalance of the Marine Ecosystems**
- **The Threat to Local Food Sources**
- **The Targeted Fish and its Harvest**
- **Removal of Essential Predators**
- **Poor Coral Reef Health**
- **Unintended Catches**
- **Growth of Algae**
- **Financial Losses**

Coral reef ecosystems support important commercial, recreational, and subsistence fishery resources in the U.S and its territories. Fishing also plays a central social and cultural role in many island and coastal communities, where it is often a critical source of food and income. The impacts from unsustainable fishing on coral reef areas can lead to the depletion of key reef species in many locations. Such losses often have a ripple effect, not just on the coral reef ecosystems themselves, but also on the local economies that depend on them. The certain types of fishing gear can inflict serious physical damage to coral reefs, seagrass beds, and other important marine habitats. Coral reef fisheries, though often relatively small in scale, may have disproportionately large impacts on the ecosystem if conducted unsustainably.

Fish comprised 95% of landings, with the remainder comprised of other groups including crustaceans (mostly shrimp, crab, and lobster), cephalopods, and holothurians. We provide some of the first evidence that fish species caught in the small-scale fisheries of the Menabe region of Madagascar are experiencing overfishing (<https://www.frontiersin.org/articles/10.3389/fmars.2020.00317/full>).

The 2018 status of the world's fisheries concluded that 33% of monitored stocks are currently fished beyond biologically sustainable limits. Yet, these assessed stocks represent less than 1% of all fished species, indicating that this figure is likely a vast underestimate of overfishing occurring worldwide. World

trade in fish and fish products continues to grow, and fisheries exports were worth an estimated \$152 billion in 2017 FAO (2018). However, the focus on market contribution often results in an under appreciation of the importance of small-scale fisheries.

### **Dumping of waste into the sea**

Covering about 70% of the Earth's surface and accounting for 97% of its water, the ocean is the lifeblood of our planet. More than three billion people depend on the ocean for their livelihoods and food security. The ocean is also home to millions of plants and animals. It produces over half of the world's oxygen, regulates climate and weather patterns, and provides medicinal ingredients that help fight cancer and other diseases (<https://www.iisd.org/articles/regulating-ocean-dumping>). Dumping involves depositing all the waste materials from factories and industries, tankers and ships and sewerage waste materials into the oceans and seas (<https://www.safewater.org/factsheets-1/2017/1/23/marine-dumping>). Floating oceanic or beach litter or ocean dumping increasing pollution in sea. Dumping of sewage and other contaminants into the ocean is often undertaken for the dispersive nature of the oceans and adaptive nature and ability for marine life. The waste dumping threatens marine ecosystems by poisoning marine life and eutrophication. *Dumping of wastes* at sea contributes an estimated 10% of the overall input of pollutants *into the sea* (Kaspar *et. al.* 1985 Newell *et.al.* 2002). The most toxic *waste material dumped into the ocean* includes dredged material, industrial waste, sewage sludge, and radioactive waste. Poisoning, envenomation, and direct trauma are all possible in the marine environment. Ciguatera poisoning can result from ingestion of predatory fish that have accumulated biotoxins. Symptoms can be gastrointestinal or neurologic, or mixed. Management is mostly symptomatic. Plastic waste is causing a sea of trouble by *poisoning* and slowly killing *marine life*. Can you imagine toxic styrene from the disposable plate The impact of marine toxins on *marine wildlife* and humans is significant. Marine toxins are responsible for avian poisonings; massive fish kills; birth (<https://scroll.in/article/880505/plastic-waste-is-causing-a-sea-of-trouble-by-poisoning-and-slowly-killing-marine-life>). The impact of marine toxins on marine wildlife and humans is significant. Marine toxins are responsible for avian poisonings; massive fish kills; birth morbidity and mortality; and sanitary, ecological, and economic problems. Marine toxins are not exclusively shellfish toxins however. Fish can also be contaminated after eating toxic phytoplankton, as in the case of domoic acid (DA)-laden anchovies, or ciguatoxic herbivores inhabiting tropical reefs. Shellfish contamination represents a sanitary and economical problem all over the world. Although viral and bacterial infections resulting from shellfish ingestion are more common, shellfish contaminated by algal toxins can cause severe and life-threatening poisonings (Tubaro, 2012). Of the many marine algal toxins identified so far, some are responsible for human poisonings, marine mammals and birth morbidity and mortality, as well as for extensive fish kills, causing sanitary, ecological and economic problems. Most marine toxins, tetrodotoxins being the exception, are produced by microalgae. These are the same primary producers that make up the basis of the marine food chain. Just as with many plants, bacteria and other eukaryotic organisms, many microalgae produce compounds with potent biological activity (<https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/marine-toxin>). These compounds are generally considered secondary metabolites, not essential for the basic metabolism and growth of the producing species. The role of secondary metabolites in these organisms is not yet completely clear and many functions have been hypothesized, for instance as chemical defences. This has been suggested for algal toxins, a class of secondary metabolites produced primary from three classes of unicellular algae: dinoflagellates, diatoms and cyanobacteria. The threat of oil spills to marine life is recognised by

those likely to be responsible for the pollution, such as the International Tanker Owners Pollution Federation. Spills are not the only pressure on marine habitats; chronic urban and industrial contamination or the exploitation of the resources they provide are also serious threats. The oil spills can have serious effects on marine life. The OILPOL Convention recognized that most oil pollution resulted from routine shipboard operations such as the cleaning of cargo tanks. In the 1950s, the normal practice was simply to wash the tanks out with water and then pump the resulting mixture of oil and water into the sea. OILPOL 54 prohibited the dumping of oily wastes within a certain distance from land and in 'special areas' where the danger to the environment was especially acute. In 1962 the limits were extended by means of an amendment adopted at a conference organized by IMO. Meanwhile, IMO in 1965 set up a Subcommittee on Oil Pollution, under the auspices of its Maritime Safety committee, to address oil pollution issues. (<https://www.imo.org/en/About/Conventions/Pages/Convention-on-the-International-Maritime-Organization.aspx>). As per information

- Dumping of wastes at sea contributes an estimated 10% of the overall input of pollutants into the sea (<https://www.iisd.org/articles/regulating-ocean-dumping>).
- Dredged material makes up about 80-90% of all licensed materials dumped.
- On average, 500 million tonnes of dredged material are dumped annually in waters of London Convention and Protocol Contracting Parties.
- Approximately 10% of dredged material is contaminated by shipping, industrial, and municipal discharges, or by land run-off.

### **Eutrophication and algal blooms**

Overgrowths of algae result in harmful algal blooms, which are more colloquially referred to as "red tides" or "brown tides". Zooplankton eat the toxic algae and begin passing the toxins up the food chain, affecting edibles like clams, and ultimately working their way up to seabirds, marine mammals, and humans. The result can be illness and sometimes death (Kaspar *et. al.* 1985 Newell *et.al.* 2002).

Recently, two applications of ecological resilience have come to the forefront and are being used at scales relevant to management. Assessments of general resilience or the broad ability of systems to maintain fundamental structures, processes, and functioning following disturbances are being used to evaluate differences in the responses of the ecosystems that comprise landscapes and identify which ecosystems are likely to exhibit critical transitions to alternative states.

### **Ecological sustainability**

Sustainable development is the overarching paradigm of the United Nations. The concept of sustainable development was described by the 1987 Brundtland Commission Report as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." There is increasing awareness that a greater understanding and emphasis of ecosystem resilience is required to reach the goal of sustainable development (United Nations, 2014, Rifkin, 1980 Daly & Herman 1992).

Sustainability means meeting our own needs without compromising the ability of future generations to meet their own needs. Ecological sustainability is defined as the maintenance or restoration of the composition, structure, and processes of ecosystems (Plant & animal community). The ecological sustainability requires prevented from rising above or falling below certain threshold levels. There are many factors that have contributed to utility of ecological sustainability as a guide to resource management.

## Ecological sustainability

- 1. Environmental Laws and Regulations**
- 2. Management of current Scenario**
- 3. Sustainable Development Flow**
- 4. Environmental policy**
- 5. Academic Information**
- 6. Open market Information**

### **Academic perspectives**

Education for Sustainable Development (ESD) empowers learners with knowledge, skills, values and attitudes to take informed decisions and make responsible actions for environmental integrity, economic viability and a just society (Berkes and Folke, 1998). Perman *et al* 2003 propose that safeguarding the environment to "deliver a set of services" should be a "necessary condition for an economy to be sustainable".

### **The flaw of the free market**

The challenge of applying the concept of ecological resilience to the context of sustainable development is that it sits at odds with conventional economic ideology and policy making ([https://en.wikipedia.org/wiki/Ecological\\_resilience](https://en.wikipedia.org/wiki/Ecological_resilience)).

### **Moving beyond sustainable development**

Andrea Ross suggested that the concept of sustainable development is no longer adequate in assisting policy development fit for today's global challenges and objectives (Ross, 2008). Because climate change is a major and growing driver of biodiversity loss, and that biodiversity and ecosystem functions and services, significantly contribute to climate change adaptation, mitigation and disaster risk reduction, proponents of ecosystem-based adaptation suggest that the resilience of vulnerable human populations and the ecosystem services upon which they depend are critical factors for sustainable development in a changing climate.

### **Environmental policy**

Environmental policy, conservation and the management of natural resources were once the function of appointed officials in the public sector (Mitchell, 1989). More recently, environmental policy and management has been constructed as a broader project, requiring the direct involvement of communities, individuals, nongovernment organizations, and the corporate sector.

### Environmental management in legislation

Environmental legislation serves to prohibit, restrict, and regulate environmentally harmful practices. Environmental legislation beginning in the 1960s, Environmental legislation and resulting regulations are continually evolving. Clearly, environmental regulations can have a profound effect on economic activity, and these effects should be included in assessment of the implementation of these regulations. Buffington & Montgomery (2013). The ability of ecosystems to recover from certain levels of environmental impact is not explicitly noted in legislation, however, because of ecosystem resilience, some levels of environmental impact associated with development are made permissible by environmental policy-making and ensuing legislation.

Some examples of the consideration of ecosystem resilience within legislation include:

- **Environmental Planning and Assessment Act 1979 (NSW)** Saxe (2012) – A key goal of the Environmental Assessment procedure is to determine whether proposed development will have a significant impact upon ecosystems.
- **Protection of the Environment (Operations) Act 1997 (NSW)** (Agency2010: Marathon Platinum Group Metals and Copper Mine Project) – Pollution control is dependent upon keeping levels of pollutants emitted by industrial and other human activities below levels which would be harmful to the environment and its ecosystems. Environmental protection licenses are administered to maintain the environmental objectives of the POEO Act and breaches of license conditions can attract heavy penalties and in some cases criminal convictions Canadian Environmental Assessment (2010).
- **Threatened Species Conservation Act 1995 (NSW)** (Canadian Environmental Assessment Agency2012) – This Act seeks to protect threatened species while balancing it with development.

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## CHAPTER 7

### DUST POLLUTION: A TRIGGER PROBLEM OF FUTURE

*Dr. Avadhesh Kumar Koshal*<sup>1</sup>

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**T**he natural *environment is made up by* all living and non-living things. The complexes of physical, chemical, and biotic factors are such as climate, soil, and living things that act upon an organism or an ecological community and ultimately determine its form and survival. Pollution is the introduction of harmful materials into the environment. These harmful materials are called pollutants. Major forms of pollution include air pollution, light pollution, litter, noise pollution, plastic pollution, soil contamination, radioactive contamination, thermal pollution, visual pollution, and water pollution. Pollutants include solid, liquid or gaseous substances present in greater than natural abundance, produce due to human activity, which have a determined effect on our environment. A *pollutant* is a substance or energy introduced into the environment that has undesired effects, or adversely affects the usefulness of a resource. Pollutants are the elements, molecules and particles involved in pollution - life can be harmed when exposed to these materials, and the effects of them on humans and plants are well known. Pollutants can be introduced into the environment in many ways, both naturally and by humans. *Pollutants* are categorized into two types: primary and secondary. Primary *pollutants* are directly emitted from the source and secondary *pollutants* form when primary pollutants chemically react in the atmosphere.

Dust is made of fine particles of solid matter (Dust. Merriam-Webster). On Earth, it generally consists of particles in the atmosphere that come from various sources such as soil lifted by wind (an aeolian process), volcanic eruptions, and pollution. Dust in homes is composed of about 20–50% dead skin cells. (Bronswijk 1981). The rest, and in offices, and other human environments is composed of small amounts of plant pollen, human hairs, animal fur, textile fibers, paper fibers, minerals from outdoor soil, burnt meteorite particles, and many other materials which may be found in the local environment (Hess-Kosa, Kathleen 2002). One-third of the global land area is covered by dust-producing surfaces, made up of hyper-arid regions like the Sahara which covers 0.9 billion hectares, and drylands which occupy 5.2 billion hectares (Jickells, et al.2005).

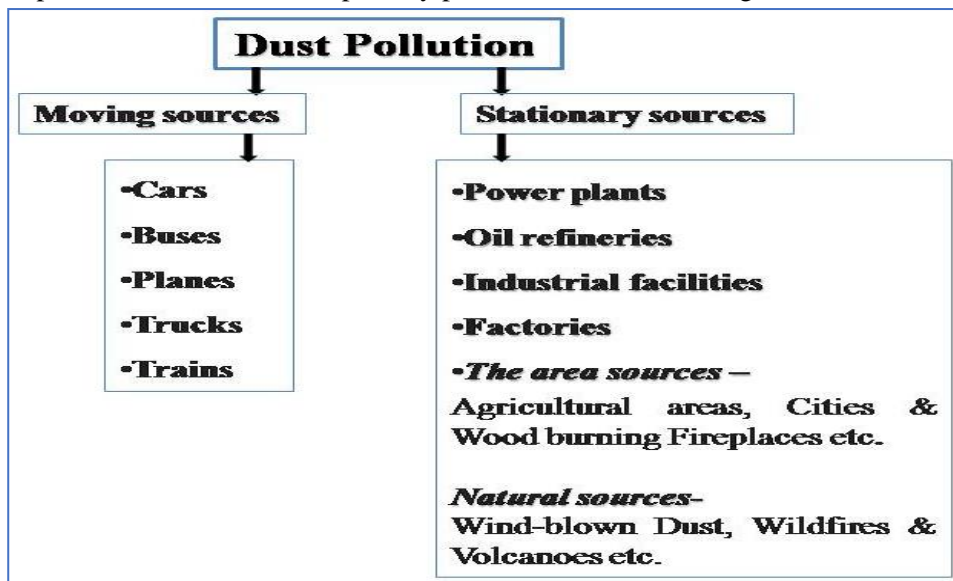
#### **What is dust?**

Dust very small pieces of dry dirt, sand, etc. in the form of a powder or fine particles of matter (as of earth) dry dirt in the form of powder that covers surfaces inside a building, or very small dry pieces of soil, sand, or other substances The *definition of dust* is fine bits of dirt or other matter that hangs in the air and settles on surfaces. Dust influences the radiative balance of the planet in two different ways, either directly by scattering and absorbing incoming solar radiation, or indirectly by changing the optical properties of clouds, themselves an important player in the climate system.

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Dust particles are playing a vital role in pollution such as cooking, smoking & dusting produce indoor particle pollution. The particles are produced by combustion are more likely to be fine particles, while particles of crustal (earth) and biological origin are more likely to be coarse particles. Dust parts such as smoke, soot, dust, and liquid droplets released into the air either by the burning of fuel or other industrial or agricultural processes, are considered primary pollutants. Its are also originate from natural sources.



#### Dust Sources:

The main moving sources are such as cars, buses, planes, trucks, and trains, the stationary sources – such as power plants, oil refineries, industrial facilities, and factories, the area sources – such as agricultural areas, cities, and wood burning fireplaces & the natural sources – such as wind-blown dust, wildfires, and volcanoes

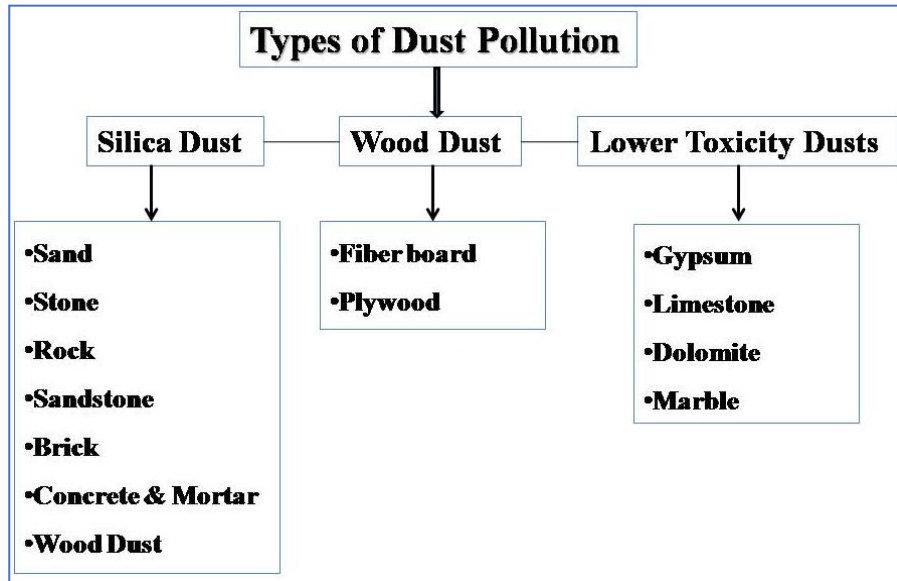
#### Particulate Matter (PM)

PM stands for particulate matter (also called particle pollution): the term for a mixture of solid particles and liquid droplets found in the air. The relationship between particulate matter (PM) and adverse health effects mainly two type short-term (acute) or long-term (chronic) PM exposure. It is usually formed in the atmosphere as a result of chemical reactions between the different pollutants. The penetration of particles is closely dependent on their size (Wilson & Suh 1997 53). Particulate Matter (PM) was defined as a term for particles by the United States Environmental Protection Agency (US EPA 2018 54). Particulate matter (PM) pollution includes particles with diameters of 10 micrometers ( $\mu\text{m}$ ) or smaller, called  $\text{PM}_{10}$ , and extremely fine particles with diameters that are generally 2.5 micrometers ( $\mu\text{m}$ ) and smaller. Particulate matter (PM) contains tiny liquid or solid droplets that can be inhaled and cause serious health effects (Cheung, 2011). The fine particles,  $\text{PM}_{2.5}$ , pose a greater risk to health (Kelishadi & Poursafa 2010 & Zhang 2019).

#### Types of Dust

It includes suspended atmospheric dust, settling dust, and heavy dust. Finally, another fact is that the half-lives of  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  particles in the atmosphere is extended due to their tiny dimensions are causing more serious health effects. These fine particles are the main cause of the “haze” formation in

different metropolitan areas (Burroughs & Rollins ; Manisalidis *et al.* 2017 & Heal , 2012). The three types of mining viz. Open-pit, underwater, and underground mining use to extract products from the ground.

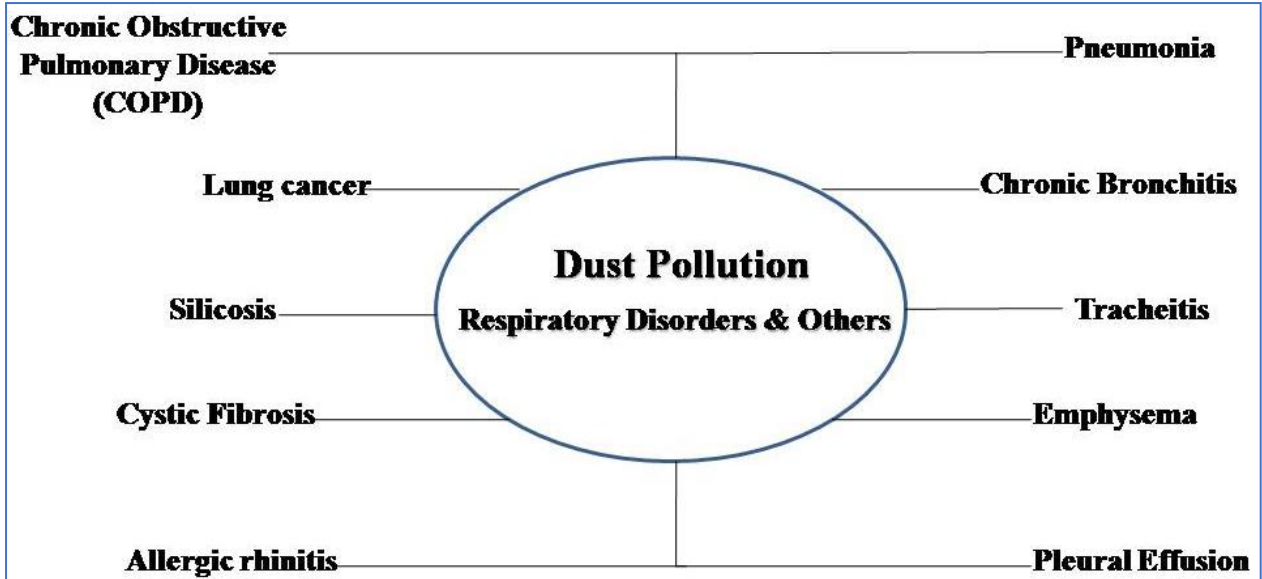


### Dust impact on Human health

Dust cause pollution effects of dusts covering vegetation (Farmer, 1993) deposition of regional pollutants causing acidification and eutrophication. deposition of heavy metals with toxic effects on plants, animals and humans. Trans boundary transport of air pollutants as fine particles. Dust includes tiny particles of debris and dead skin. Its small size means it can be inhaled and potentially evoke an immune reaction. Such allergic reactions may be minor or major depending on the individual. Dust can also serve as a “fomite”, potentially carrying viruses and possibly passing on infections. Dust impact on human health, the particles smaller than 10  $\mu\text{m}$ , may be problematic in the nose, mouth and upper respiratory tract, thus can be associated with respiratory disorders such as asthma, tracheitis, pneumonia, allergic rhinitis and silicosis.

Human health effects of dust contain microscopic solids or liquid droplets that are small enough to get deep into the lungs and cause serious health problems. Large particles may irritate the nose, throat and eyes. Dust kicked up by vehicles traveling on roads (2021) may make up 33% of air pollution (Reddy & Srinivas 2007). Road dust consists of deposits of vehicle and industrial exhaust gas, particles from tire and brake wear, dust from paved roads or potholes, and dust from construction sites. Road dust is a significant contributor to the generation and release of particulates into the atmosphere (Environment Canada 2021) Coal dust is responsible for the respiratory disease known as pneumoconiosis, including Coalworker's pneumoconiosis disease that occurs among coal miners. Crystalline silica is found in materials such as concrete, masonry and rock. When these materials are made into a fine dust and suspended in the air, breathing in these fine particles can produce lung damage. Silicosis can be totally disabling and may lead to death.

The two main types of pneumoconioses that affect miners are coal workers' pneumoconiosis (CWP) and silicosis. CWP, commonly called black lung, affects workers in coal mining. Silicosis can affect workers in many types of mines and quarries, including coal mines



**Dust impact on vegetation:**

Dust may affect photosynthesis, respiration, transpiration and allow the penetration of phytotoxic gaseous pollutants. Visible injury symptoms may occur and generally there is decreased productivity. Most of the plant communities are affected by dust deposition so that community structure is altered. Dust particles clog the stomata openings; cover the lamina surface, reducing the pore size and intensity of light, resulting in reduced respiration process and net photosynthesis. Trees such as tamarind, iluppai, Beauty of monosperma, magizham, kadambam, elandhai and vilvam are also capable of clearing dust. The role of trees in absorbing pollutants was first studied in 1994 by experts at the US Forest Service.

**Dust affect climate**

Coarse dust particles warm Earth's climate by absorbing both incoming radiation from the sun and outgoing radiation from Earth's surface. These particles can impact stability and circulation within our atmosphere, which may affect atmospheric phenomena like hurricanes. Dust is a key component of Earth's climate system. When it interacts with clouds, oceans and the sun's radiation, it has an overall impact on our planet's living systems, affecting everything from weather and rainfall to global warming

**CONSTRUCTION WORK CREATING DUST**

Silica dust: Silica dust is created when workers are dealing with materials containing crystalline silica, such as sand, stone, rock, sandstone, brick, concrete, and mortar (also known as respirable crystalline silica or RCS). <https://oransi.com/blogs/blog/dangers-exposure-construction-site-dust> Construction dust can seriously damage the health of construction workers and if exposed for longer times can eventually even kill them. About 22,000 to 52,000 persons per year are dying due to inhaling polluted air in USA alone – most of whom are construction workers. In Great Britain, over 500 construction workers are believed to die every year from lung cancer. America and Europe have enacted rules to mitigate the effects of dust. In India, though there are several regulations like the Factories Act, 1948, Mines Act, 1952, Metalliferous Mines regulation, 1961, and Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and Rules, they specify much higher limits of particulate matter and silica dust which are harmful to construction workers. Moreover, these limits are rarely imposed. The rules

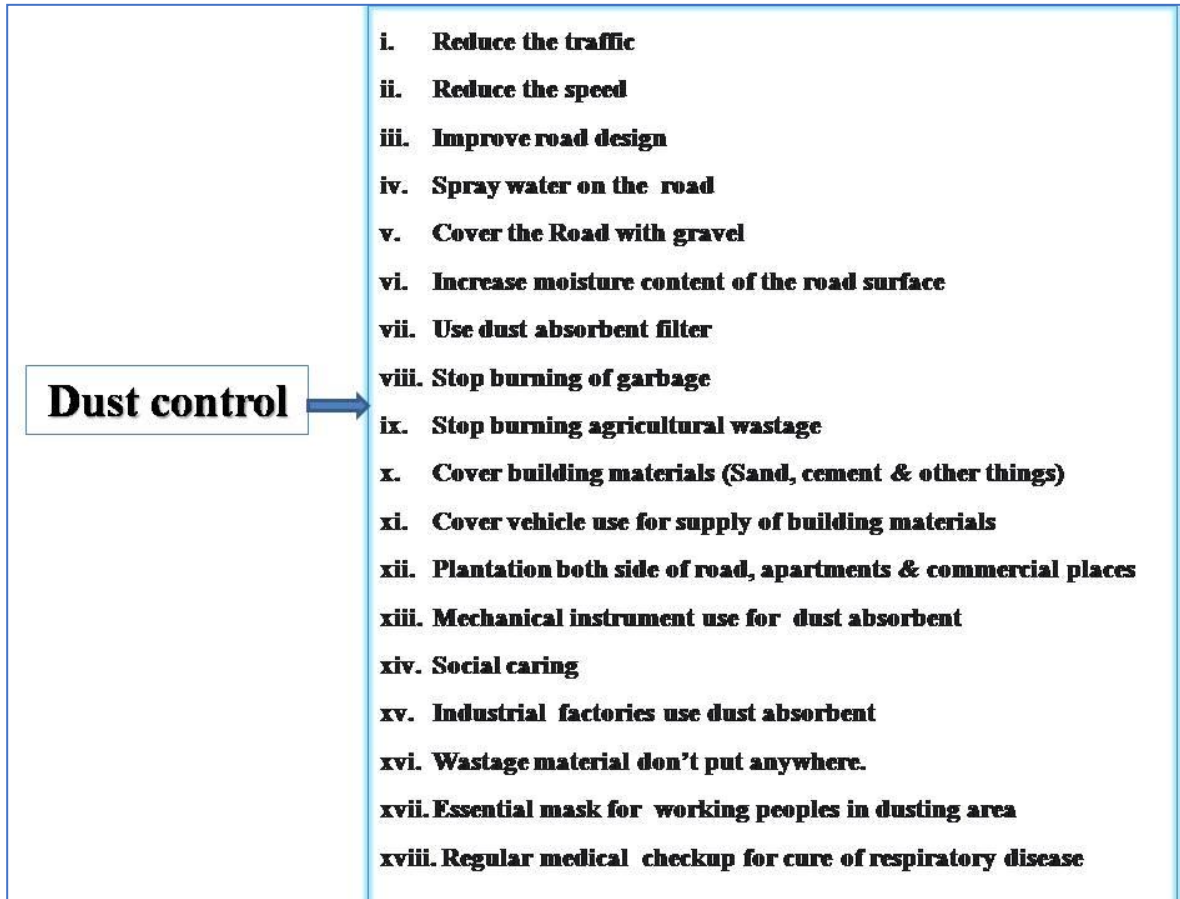
directed towards construction water disposal, plastic bags, or smoke emitted from chimneys of cement plants are good, but often present only on paper and rarely implemented. In this article issues such as main causes of construction dust, its effect on workers, international rules to mitigate the problem, equipment that should be used, etc. are briefly discussed. Hope this will bring awareness within the building industry in India and start a movement towards mitigating the effects of construction dust.

**Major Dust Control Techniques are**

Do air purifiers remove dust or not? The short answer is yes, most air purifiers on the market are designed to remove large dust particles from the air. Many feature mechanical filtration, which is a method of capturing pollutants on filters.

Dust control is the system implemented to reduce or eliminate dust emissions from the activities that generate airborne and fugitive dust and cause erosion. The amount of dust generated depends on several factors, including the nature of the surface, to what degree the surface is disturbed and climactic conditions.

1. Reduce the traffic.
2. Reduce the speed.
3. Improve road design.
4. Water the road
5. Cover the Road with gravel.
6. Increase moisture content of the road surface
7. Bind the road particles together
8. Seal unpaved roads.



**Conclusion:**

Dust may be normal. It depends on how much dust you see floating in the air, but seeing them can mean that your indoor air quality needs to be checked. Today dust are major problematic pollution both in developed and in developing countries, overexposure to dusts causes disease, temporary and permanent disabilities and deaths. Dusts in the workplace may also contaminate or reduce the quality of products, be the cause of fire and explosion, and damage the environment. Dust found in everywhere means books, carpet, rugs, upholstered furniture, fireplaces, and pets all contribute to the dust load. Dirt, pollen, smoke, exhaust, sand, and many other things may bring in dust from outside. In addition, mold, bacteria, and dust mites are all likely to inhabit and often proliferate in dust.

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## CHAPTER 8

# TOURISM AND TOURIST DESTINATION FOR SUSTAINABLE GROWTH

*Dr. C. M. Mathapati*<sup>1</sup>

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### **Abstract**

There is currently no widely accepted definition of the term tourist destination. A Tourist destination is a place of interest where tourists visit, typically for its inherent or exhibited natural or cultural value, historical significance, natural or built beauty, offering leisure and amusement. Tourism is not merely a business for providing pleasure and rest. It has now grown into a big industry. Every year thousands of tourists visits a destination or region as to get that pleasure or to get that experience of visiting a new place as a result we earn lot of revenue, Tourism is the act of going for joy and roaming particularly in an unknown destination. Moreover, it is a sorted out adventure amid which a few spots are visited. However, tourism is not just confined to humans traveling to new locations; Tourism isn't just a business for giving joy and rest. It has now developed into a major industry these tourists are distinguished based on some evaluation, such as how frequently a tourist visits, how many days a tourist stays over and over again; this paper here gives a glimpse of tourist's types and types of tourism which are ongoing in present world.

*Keywords: Tourists, Visitors, Destinations, Tourism and Travelers.*

The big complication of tourism is managing tourism and tourist's sustainable tourism has to be based on local resources and capacities. These local resources include assets directly linked to tourism, such as accommodation or tourism offers as well as natural and cultural assets, agriculture, infrastructure and human resources that are indirectly related. The coordination of these factors is not an easy task.

Tourism is a social cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business or professional purposes, these people has various names as visitors, and many other names such as tourists or excursionists.

Tourism is the practice of travelling for pleasure, thrills, or an experience of visiting a place especially on one's holidays. It is an organized journey during which several places are visited. The main dimensions of tourism are vision, common goals, and active development strategies, made applicable by compilation into a tourism program. Such a program details the possible opportunities to develop tourism in a region within the destination. Based on detailed information about the local environmental, social, cultural, political and legal aspects, it helps the local authorized personnel to identify a common vision for tourism develop which covers a certain kind of tourists and describes him as to attract similar tourist to the destination.

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Tours and holidays are the necessities of modern busy life. Gone are our peaceful and leisurely ways of life. Instead we have now to lead a busy and hurried life. In our daily life, we have to work very hard while discharging our duties and responsibilities. We also have to respond to various calls coming from home and outside.

Fast transportation and technological advancement has led tourism a major sector to earn revenue whether international and domestic. Improvements in land transportation, especially high speed road and rail systems, also took place in many countries. Along with transportation improvements, other factors giving impetus to travel were: increased incomes of a substantial number of people resulting from the economic development, raising educational levels, provision of vacation periods and lengthening of vacations for a large number of workers, the increasing popularity of holiday travel, and the rapid growth of international business travel. Further stimulus was provided for the growth of long distance tourism with development.

### **Background of the study**

#### **Tourist destinations, services and industry**

Tourist destinations can be defined by their geographical location, scope for tourism activity and different characteristics of their sites a tourism destination caters the basic amenities of tourists with the base attraction of the place. However, few tourist destinations are multifunctional in nature providing a wide range of tourism aspects in their surroundings.

Tourist services are concerned with providing various levels of services to the tourist! Traveler in the course of his/her journey. These services are provided by the service providers like travel agents, tour operators, agencies etc.

Understanding tourism as an industry facilitates various segments of tourism services which are interlinked to each other, creating a platform for this fast-growing industry.

#### **Natural Interest Areas**

Nature has developed a number of areas almost in every part of the world attracting people to enjoy the gift of nature through the phenomena of tourism. Besides mountain and hill resorts, beaches and river-side resorts, the natural interest areas also include various adventure spots place where a variety of adventure sports like mountain trekking, snow sporting, paragliding and water sporting can be done.

These natural interest areas are developed by utilizing the suitable geographical location for nature tourism and providing the resources to these areas for promoting tourism.

These natural interest areas are developed by utilizing the suitable geographical location for nature tourism and providing the resources to these areas for promoting tourism. Himalayas in the northern part, Nilgiris in the south, Arawallis in the Western Ghats and the exotic high hills in the north-east are beautiful examples best known for nature ' tourism.

#### **Wildlife Tourism Destinations**

Biological diversity has played a vital role in the development of wildlife tourism in the form of sanctuaries, wet land, all types of national parks and wildlife reserves and an unlimited range of flora and fauna around the world.

India is one of the top wildlife tourist destinations providing a wide variety of wilderness tourism destination. The wildlife tourism destination in India has a range starting from the Kashmir valley in the

north to Periyar and Bandipur National Parks in the south and Kaziranga National Park of Assam to Ranthambore and Gir in western part of India.

The likes of Bandhavgarh, Corbett, Kanha, Betla and Sunderban add variety to the wildlife tourism throughout the country. People from all parts of the world enjoy the beauty of nature along with the rare and diminishing species; of the animals and the birds.

### Heritage Culture as Tourism Destination

Heritage cultural centres are the backbone of the Indian tourism industry. Tourists across the world visit India every month to enjoy the unity and diversity of Indian culture. Festivals in India are celebrated at the pace of almost every day of the year, as India has a great diversity in the culture, customs and tradition offering tourists the choice of various locations and time schedule as per their fondness. The heritage culture destinations lie into the likes of havelis, royal palaces and forts and the exotic old-era historical monuments blending with the colorful Indian culture providing eye-catching memory to the visitor. Historical symbols like Taj Mahal, Qutub Minar, Ajanta and Ellora caves, India Gate, Sanchi Stupa and celebrations like Holi, Diwali, Eid, Pongal, Baisakhi show the depth in Indian Heritage and culture promoting it to a tourist destination.

### Types of tourists

A tourist is a person who travels to a country other than his/her country of origin or moves to a place within the country of origin but outside his/her normal environment for a minimum of 24 hours and not exceeding one year. Table 2.4 lists the differences between the various types of tourists. A tourist can be classified as follows:

- 1) **Visitor:** A visitor is a person visiting another country or his/her own country for less than one year without any purpose of work being paid for. A visitor can further be divided into external visitor who travels to a country other than his/her origin country where he/she resides, whereas the second type of visitor, i.e. internal visitor travels within the vicinity of the origin country or the country of residence.
- 2) **Traveler:** A traveler is a person who moves from one location to other; in other words, it refers to a person on any tour or trip between two or more places. A traveler could be a tourist; but all travelers cannot be considered as tourists as the purpose and time duration of the trip cannot allow them to be put into the tourist category. The examples of these travelers include diplomats, workers, nomads, etc.
- 3) **Excursionist:** An excursionist refers to a temporary visitor who visits a place for less than 24 hours; so as per the definition of a tourist, excursionist cannot be considered as a tourist as they are the same-day visitors to a place. The examples for these kinds of visitors may include: a one-day (less than 24 hours) excursion tour of a school or college students.

Table showing Differences between Various Types of Tourists

Basis	Visitor	Traveler	Excursionist
Visits	Visiting to another country or his own country	Visiting between two or more places	Visiting any place from the normal place of origin
Time duration	Less than one year	No limits	Less than 24 hours
Purpose	Any exercise other than the purpose of being paid for	Any purpose	Outing or hanging out or pleasure trip

Table 1

## **Types of tourisms**

There are various types of tourisms, which are discussed below in detail

### **1. Intra-regional Tourism**

This is the type of tourism in which the tourist traffic flows to and from countries of the same region of the globe. So, in other words, we can say that intra-regional tourism is an important component of international tourism as the flow of the tourist goes internationally between two or more nations of the same region. This type of tourism is highly adopted or significantly seen in the developed countries/regions of the world, while developing nations are comparatively less influenced by this form of tourism. However, it is observed that the importance of intra-regional tourism may vary from region to region or country to country.

### **2. Inter regional Tourism**

Inter-regional tourism refers to the tourism practice where the flow of tourist goes from one region to another region internationally. This is also a kind of international tourism as the movement occurs between two or more different regions of the world. Moreover, this type of tourism focuses on integrated development and equitable distribution of income.

### **3. Inbound Tourism**

This type of tourism refers to the condition where a tourist is entering into a country. Here, a person is entering into a country other than the origin country, making him inbound for this new tourism environment.

### **4. Outbound Tourism**

This situation belongs to a tourist who is leaving his/her country of origin for another country. Here, the person leaves the country of origin for other country/destination, becoming outbound.

### **5. International tourism**

This kind of tourism is the movement of inbound and outbound tourists across the borders, where tourists are exploring a new tourism environment, entering into a new country (inbound) or by leaving their country of origin for experiencing new destinations (outbound). In both the cases, the borders of nations have been crossed by the tourists calling it 'international tourism'. This type of tourism requires various kinds of legal and financial formalities like of having a valid passport and visa with the tourist. Currency exchange is another formality that needs to be met by the tourist. There are several other barriers in this tourism, as the tourist moves into an unusual environment where he/she faces language culture, social and political changes.

### **6. Domestic Tourism**

This type of tourism activity refers to the condition where the tourist of a given country, moves within the boundary of his/her origin country. In this type of tourism activity, borders of nations are not crossed by the traveler, he/she moves within the country of origin; or in other words, we can say that it is the tourism of resident visitors within the economic territory of the country. In fact, it is easy to explore tourism activity in domestic tourism, as there is no change of currency and language. It also does not require any documentation formalities like visa and passport and immigration.

### **7. Alternative Tourism**

This type of tourism can be define as 'tourism which allows both guest and host to enjoy positive and worthwhile interaction through natural, social and community values'. Butler has observed that this tourism

is developed among the local people who travel to relatively remote, undisturbed areas with the objective of admiring, studying and enjoying the scenery and its wild plants and animal and various cultural attributes. This tourism also involves the conservation of environment and its sustainability and well-being of the locale. Such tourism is spread at a very small scale, and accommodation for the tourist is locally arranged with very limited facilities. The phenomenon of tourism under this category is totally different from all other forms and types of tourism. The travelers/ tourists performing alternative tourism like to do things differently They do not prefer the usual mode of tourist accommodation, food and catering services, transport facilities and various other services. Alternative tourism is explored with local friends and people knowing the social, cultural, political and religious tourism environment of the area. With a wide range of variety in Indian geographical, social, religious and traditional outline, it is becoming one of the major alternative tourism destinations.

### **Conclusion**

Tourism creates opportunities to develop new amenities and recreation facilities that would not otherwise be viable in a community. Tourist expectations can upgrade service by local shops, restaurants, and other commerce operators. Tourist traffic in a community creates an opportunity for upgraded fire, police, and medical protection that also benefits residents.

Directing tourism growth toward local needs, interests, and limits can greatly enhance tourism's value to the community and help create a sustainable industry. Many small regions have the resources for successful tourism development. Creating a local tourism industry is not a discouraging task, but making tourism really on top form the local authority requires work. Creating a successful and sustainable tourism industry is like creating any successful and sustainable economic activity

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## CHAPTER 9

### GLOBAL EMPLOYEE ENGAGEMENT – AN EMPIRICAL TREND ANALYSIS

*Dr. C. M. Mathapati*<sup>1</sup>

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#### **Abstract**

The concept of employee engagement is gaining attention day by day. Most of the companies these days treat their employees as their capital. Organizations feel that only an engaged employee could fully contribute to their goals and increases the value of the organization. When employees feel positive towards their work then they help towards common goals. If they are provided with proper working conditions and all other requirements then they will be satisfied with their job. In this study, the parameter used is experience to check the employee engagement. A proper methodology has been provided that how this research has been conducted. The test named Chi-Square is applied because it is commonly and popularly used in statistics to test any hypothesis. This study has also provided recommendations on the basis of which the engagement of the employees could be retained and increased.

**E**mployee engagement is a concept that is related to the organization. It is an emerging concept in today's world. This term of employee engagement is gaining attention day by day due to its immense importance. As we know employees are an inseparable part of any organization, therefore, there is a need to conduct a proper study about their needs, expectations, motivation level, physiological factors, etc. in this regard the term employee engagement has come into focus. Employee engagement means the connection of the employee with the organization. It is a two-way process between the employers and the employees. This means that the employees working at a present salary level, management decisions and other things are totally satisfied with it. They are putting their best effort into working. There is a proper channel of communication and participation between the employers and the employees. In this era where globalization is its peak, it becomes important for every organization to retain its employees. Employees these days are given full importance and are treated as capital. If employees are willing to work they will better achieve the organizational objectives. Employee engagement may have different levels like engaged, not engaged, actively disengaged as per Gallup. Engaged employees are always curious to improve their working by learning new things that could help them to achieve organizational goals. Not engaged employees are those which are task oriented rather than objectives oriented. There is not a healthy relationship between the employers and the employees in this concept. Actively disengaged are those who see negativity in every possible thing which is not good for the organization's environment. So employee engagement is crucial for every organization for retaining its employees.

**Needs of the study-** The study of employee management is essential due to the following reason:-

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- **Globalization**- In this modern era where there are no boundaries between the countries. Employee engagement gains more importance. The market place has been changing day by day, therefore, it is much important for the organization to retain skilled and talented employees. For such purpose, there is a need to understand employee engagement.
- **Relationship management**- Communication is the key to the effective growth of relationship in any organization. Employees should be encouraged to take part in the decision-making process so that they will feel motivated. This need for relationship building could only be possible with the help of employee engagement.
- **Low turnover**- For every organization talented human capital is of vital importance. When employees don't feel satisfied with their position in the organization due to any cause, they tend to move to better places. To retain the employees and lowering down your labor turnover it is needed to give importance to the employee engagement.

**Objectives of the study**- There are the following objectives for conducting this empirical analysis:-

- To check the efficiency of the employees.
- To check the motivational level, skills, morale, talent, attitude, the behavior of the employees.
- To make them aware about the targets to be achieved.
- To encourage the employees for active participation in the decision-making process.
- To build a healthy relationship among employees.
- To make the organization aware of the competition.
- To improve the overall development of the organization.

**Research Methodology**- There is the following methodology which is being followed while doing any research. There are following basic steps need to be followed while carrying out any research.

1. **Formulation of the research problem**- While constructing research we should first determine the question or a problem to which we need an answer. In this step, a researcher has to decide about his broad area of interest. In our research, we are trying to find out the empirical analysis on the basis of employee engagement. We have to set our main objective or focus on conducting research. Here our main focus is on employee engagement. Then there is a need to fill the gap between the existing knowledge and the unresolved query. The research problem should be clearly defined as it is the basis of any research.
2. **Literature review** - Literature review is the second step of the research process. It helps the researcher to gain additional knowledge about his research problem. With the help of the literature review, a researcher is able to acquaint himself with his area of interest. It brings clarity of thoughts to the researcher. The procedure of reviewing literature is searching for the existing literature, reviewing it and developing knowledge about the Research question. Main sources of the literature review are books, journals, periodicals, magazines, newspapers, articles, research papers, etc. With the help of the internet, it becomes very easy to review the literature as a wide amount of information is available about any topic just on a click. A researcher has to check the accuracy and authenticity of the data available in the that will literature that he is selecting. So literature review is an important step in the research methodology.
3. **Developing a hypothesis** – Hypothesis simply means an assumption regarding anything which may be wrong or right. In the case of research problems, a hypothesis gains much importance due to its formal use. A researcher has to develop a hypothesis about his research which may be accepted or

rejected. It is also known as an educated guess. A hypothesis has some features like its validity should have to be unknown, it should be simple, it must be applicable to the whole universe. The hypothesis has different kinds like Descriptive, Rational and exploratory on the basis of research. It depends upon the researcher which kind of hypothesis is required to him.

4. **Creating a Research Proposal-** It is a document having summary of all the objectives which are related to the research. It is an outline of the process which is being followed during the research. A research proposal is very important. Due care should be given while preparing a research proposal. It consists of 6 to 7 pages. It is prepared by the researcher himself to provide a description of the program. It gives The Reader a summary of information that is being incorporated into the research.
5. **Research design-** Research design consists of sampling designs and data collection designs.
  - a) **Sampling designs-** A researcher has to select an appropriate sample while conducting research. As it is not possible to study the entire population because it will consume a lot of time and energy. It is always advisable to select a sample out of the population which is representable of the entire population. The sampling designs are of two types namely probability and non-probability. Let us discuss them below-
    - **Probability sampling-** when there are equal chances of every item in the population of being selected is known as probability sampling. It may be with a replacement or without replacement. There are the following methods of probability sampling.
      - i. **Simple random sampling-** It is a technique of sampling in which a sample is selected either by the lottery system or by using the random tables numbers that are allotted to every unit of the population
      - ii. **Stratified random sampling-** When the population comprises of different characteristics then they are divided into strata. These strata could be on basis of age, religion, sex, study, locality, etc. These strata consist of the population having similar characteristics. Then a sample is being selected from each strata.
      - iii. **Cluster sampling or area sampling-** As the name suggests the whole population is divided into various clusters and the entire cluster is selected as the sample. When clusters are formed on the basis of their geographical region, then it is known as area sampling.
      - iv. **Systematic sampling-** Here sample is being selected on the basis of some predetermined method. Eg. Every 5<sup>th</sup> item of the population will be a part of the sample.
    - **Non- probability sampling-** In this sampling, every item doesn't get an equal chance of being selected. The selection is purely based on the purpose of the study. A small element of bias is involved herein. There are the following methods of non-probability sampling.
      - i. **Convenience sampling-** In this method, the researcher selects the sample which is convenient and easily available like our friends, family, neighbors, etc.
      - ii. **Judgment or Purposive sampling-** In this method, the researcher selects only those persons which according to him fulfills the purpose of the study. Here the researcher is of the view that the sample chosen could provide the best information.
      - iii. **Quota sampling-** Here the sample is selected on the basis of some quota. It is very much like purposive sampling but results are doubtful here.
      - iv. **Snowball sampling-** Here the researcher first selects some samples then those samples are asked to refer other persons which could fulfill the need of the research. In such a way it goes on increasing like a snowball.

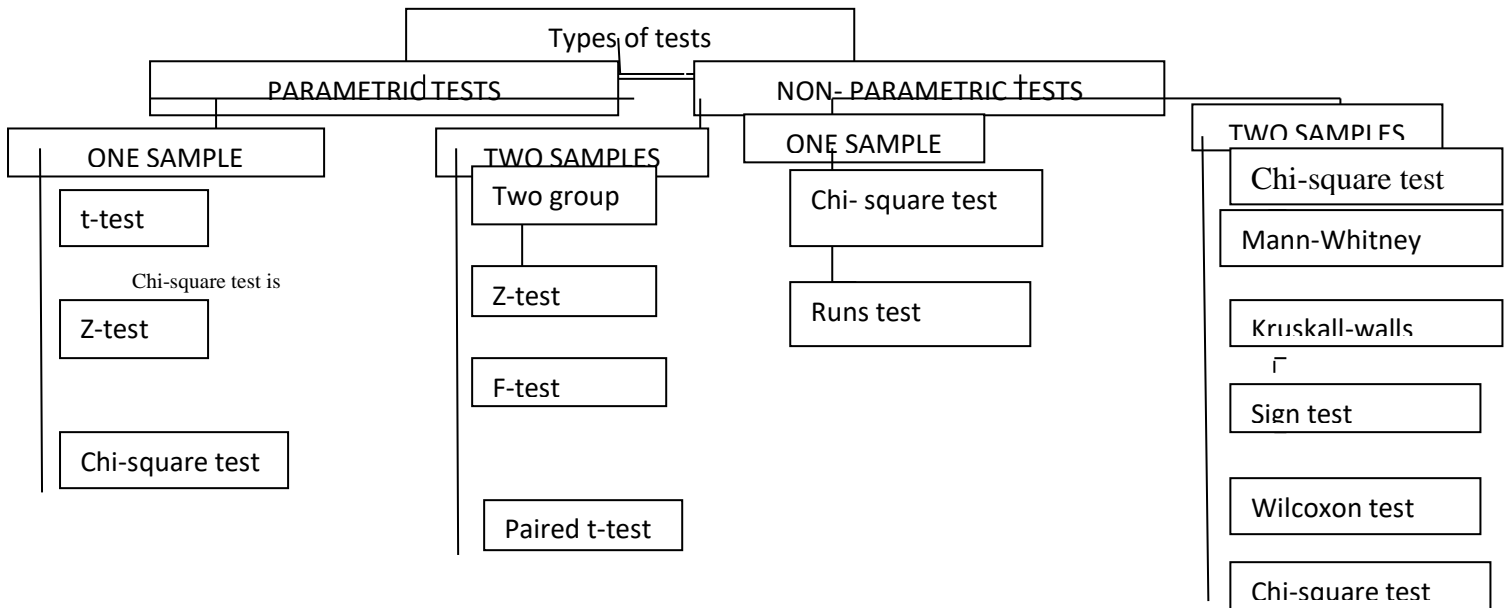
- b) **Collection of Data-** Data could be collected from two sources which are classified into primary and secondary.
- **Primary source-** When the researcher himself collects the data for the first time it is known as primary data. Primary data is reliable as it is collected on the basis of the research problem by the researcher himself. It consists of observations, personal interviews, telephonic interviews, mailed questionnaire, schedules, etc. The collection of data from primary sources consumes so much time and energy but it is worth the reliability.
  - **Secondary sources-** The data collected as primary data becomes secondary when used by some other person. It is a second-hand data. It does not involve much time and energy. Some of the sources of secondary data collection are directories, bibliographic database, numeric database, full-text database, encyclopedias, journals, panel surveys, case studies, etc.
6. **Processing and classification of data-** The next step is to process the data which is being collected and then to classify it. Processing of data involves editing and coding of data. Editing is done to remove any kind of grammatical errors or spelling errors. It is important to enhance the use of data. Coding is done to simplify the data so that it is easy to read and understand. The first step is to check whether the data is quantitative or qualitative. Then the coding is done by providing them symbols, numbers, alphabets, etc as their codes. Classification is of two types namely simple and manifold classification. In simple classification, there is only two classes and not more than two. When there are more than two classes to divide the data then it is known as manifold classification.
7. **Hypothesis testing-** After the classification and processing of the data there is a need to do the hypothesis testing. In this researcher could use various tests to test his hypothesis. There are various tests which are available like chi-square test, ANOVA, Karl Pearson coefficient method, etc, which has originated by various scientists over the time to check the validity of the hypothesis. On the basis of these tests, a hypothesis may be accepted or rejected.
8. **Generalization-** Generalisation means the theory which is developed by the researcher is applicable to the whole universe. After testing of the hypothesis, it is necessary to check the general liability of the data. Generalizations are always made to form something new theory. It is one of the features of the hypothesis to be Generally Accepted.
9. **Report Writing-** The last step in the research methodologies to write the Research report. This report consists of all the information about what you have done when you are conducting that research. It consists of the objectives of the research, problems faced by the researcher, implications of that research, findings which have been drawn from that research.

**Hypothesis-** Hypothesis is an assumption about the population parameter. It is merely a guess which may be accepted or rejected. A hypothesis should be valid, clear and precisely stated. There are various types of hypothesis which are discussed below.

- **Null hypothesis and Alternative hypothesis-** These two are the commonly used hypothesis. Null hypothesis tells us that population and sample does not have any difference. On the other hand and alternative hypothesis tells us the difference is there between sample selected and population parameter. The symbol used for denoting the null hypothesis is  $H_0$  and for alternative hypothesis it is  $H_a$ . A researcher always tries that a difference must occur between sample and population so that he could accept the alternative hypothesis.
- **One-tailed and two-tailed hypothesis-** These types of alternative hypothesis means that the population parameter may be more or less than the sample selected. One-tailed is also called the

directional test as it tells us a single direction of the mean. A two-tailed hypothesis is non-directional because it may be right-tailed or left tailed.

**Testing of Hypothesis-** There are various tests which are used for testing a hypothesis popularly categorized as tests of parameters and non-parameters. Parameter tests are based on some assumption about that population from which such sample has been drawn. Non-parametric tests are distribution free and not based on any kind of assumption.



The most common test that is used in testing of hypothesis is Chi-square test and its formula is given below

$$\chi^2 = \sum_{i=1}^k \left[ \frac{(O_i - E_i)^2}{E_i} \right]$$

Here O = Observed frequency, E= Expected Frequency,

Degrees of freedom (df) = n-1, where n is the number of classes

If the value that we calculate is less than the table value, then we accept the null hypothesis and If the value that we calculate is greater than the table value, then we accept the alternative hypothesis.

**Test of the relation between the experience of employees and engagement of employees**

**Null hypothesis (h0)-** It shows that there is no effect of experience over the employee engagement.

**The alternative hypothesis(ha)-** It shows that there is effect of experience over the employee engagement.

**Significance level –** we have taken the significance level at 5% of value 3.481

RECENT TRENDS IN MULTIDISCIPLINARY SUBJECTS, VOLUME-1

Experience	Low engagement	High engagement	Total
Less than 5 years	415	185	600
5-10 years	335	65	400
total	750	250	1000

Expected frequency-  $[\text{Row total for the row of that cell} \times \text{Column total for the column of that cell}] / \text{Grand total}$   
 Group1. Less than 5 year and low engagement-  $750 \times 600 / 1000 = 415$   
 Group2. 5-10 years and low engagement-  $750 \times 400 / 1000 = 300$   
 Group3. Less than 5-year exp. And high engagement-  $250 \times 600 / 1000 = 150$   
 Group4. 5-10 years exp, and high engagement-  $250 \times 400 / 1000 = 100$

Groups	Observed fq.	Expected fq.	E-O	(E-O)square/E
1	415	450	35	2.72
2	335	300	35	4.08
3	185	150	35	8.16
4	65	100	35	12.25
total				27.21

As we calculated that the table value is 27.21 which is more than the significance value of 3.481 so we will reject the null hypothesis and select the alternative hypothesis.

**Data analysis and interpretation:-** For the analysis of the data there are various tools like percentage, averages, correlation, regression, etc have been used. it depends upon whether the data is qualitative or quantitative.

- **If Quantitative data-** In the case of quantitative data the researcher has to first establish the important themes and then allot the coding to important themes which have been used repeatedly. Then as per the basis of themes he has to classify the data. after collecting the responses fall under the theme the last step is to integrate those responses in your report.
- **If Qualitative data-** Qualitative data analysis could be used where there is a large population. There are two methods of analysis manual data analysis and computerized data analysis. If the variables are small then the manual data analysis could be used otherwise it is better to use computerized data analysis

Data interpretation has been done with a view to providing an explanation of the methods and theories used in testing the hypothesis. Like in our report we have established a relationship between the employees past experience and their engagement level with the work. We have used chi-square test formula to establish a relationship because it is the most widely used formula. It is popular because it has the qualities of both parametric and non-parametric tests.

**Findings and Interpretations:-** With the help of hypothesis testing we have found out that there is the use of chi-square test to check the validity of data. We could check that the employees having less than 5 years of experience have a high engagement at first and then after 5 years, it goes on decreasing. We could also find that those who have a low engagement at less than five years of experience has increased after some time. Here the value of the table is more so we could interpret some relationship between the employees past experience and their engagement level.

**Implications-** employee engagement means that an employee is fully engaged with his mind and body with the work given to him. He wants to engage in business activities and objectives. He feels like a part of the organization. This is possible when management has given due care to the engagement of employees. High level of Engagement is possible when the employee feels that what he is doing hold some value to the organization. When he believes that he has occupied some place in the organization which is important. job characteristic plays an important role in determining the employee engagement if there is proper employee engagement then there are better chances of Greater productivity. If the engagement of employees in the organization is high then there will be low absenteeism and low-level turnover which will help in increasing the effectiveness of the employees and the organization as a whole.

**Recommendations for better employee engagement:-** There are some recommendations for improving employee engagement.

- **Working conditions-**We all know that the employees have to work in the organization for about 9 to 10 hours daily so their working conditions affect them in a great way if employees are not provided with proper working conditions then there will be a loss in their motivation level and moral which will lower down their efficiency. If the field comfortable while doing work it will increase their productivity. So it is recommended to provide a comfortable working environment for the Employees
- **Rewards-** Rewards is another way of improving employee engagement. There are some persons in the organization which are always motivated if they provided a proper reward for their work done. The reward could be in the form of praise, furniture of good quality, medical insurance, Life Insurance, Health Insurance, etc. When employees are provided with these rewards in addition to their basic pay it increases their engagement level and their confidence level with the organization.
- **Training and Development-** Training and development is another important aspect in the development of the employees. If employees are provided with the proper training then they will be skilled to perform the jobs better. In some organizations, there are special classes for the training and development of employees. When there is any change in the Technology it is always advisable on the part of the management to provide its technical expertise to the Employees. It will not increase only the scale of their employees but also increase the relationship between the organization and its employees.

**Conclusion:-**

This study was done with the view to check the levels of employee engagement. It examined the hypothesis relationship between the experience of the employees and their level of engagement with their organization. It could said be that there is an association between these two factors which has been used in the study the experience of employees and the level of engagement. The recommendations are working conditions, rewards, training and development, if all these things will be provided to the Employees they will feel happy and satisfied with the organization and the level of their engagement will also be increased. If the employees feel highly motivated they will be satisfied with their job. If there is proper communication between different levels of the organization then there are better chances of employee engagement. Management of the organization should have to try to conduct periodic meetings for building a proper and healthy working relationship with its employees. This could help in improving the overall efficiency of the organization.

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# CHAPTER 10

## IOT BASED AUTOMATIC BUS STOP SHELTERS

*Dr. Jacob Abraham*<sup>1</sup>

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### ABSTRACT

The main objective of this chapter is to discuss about design and to analyse building of a bus stop architecture using Arduino. This bus stop is completely smart. Time, date and day will be displayed on the LCD screen for the people. To manage a good amount of air flow, the roof of the bus stop will be open in normal weather conditions. If there is rain or heavy sunlight, the bus stop detects the weather change and closes the roof automatically. In other words, this bus stop is more concerned about the comfort of the people who use it. The project was developed on Arduino - an open-source electronics platform based on easy-to-use hardware and software. Arduino board senses the environment by receiving inputs from many sensors, and affects its surroundings by controlling various actuators. The Arduino board is programmed by writing code in the Arduino programming language and by using the Arduino Integrated Development Environment. Unlike most other programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board - you can simply use a USB cable.

### 1. INTRODUCTION

**B**us stops are, in some locations, clustered together into transport hubs allowing interchange between routes from nearby stops and with other public transport modes to maximize convenience. People wait at a bus stop for their buses, then make eye contact with the driver so he stops, then get on the bus and pay. The bus will only stop at designated bus stop locations. Typically, the smart bus stops have provided as a sitting area that can be used while awaiting transportation, as well as shelter from the natural elements like sun, wind and rain. Provide real time transit data like date and time. The aim of this project is to design a smart bus stop architecture using Arduino. To build the project, our required components are,

- Arduino UNO
- Servo motor
- RTC module
- 16x2 LCD
- Rain sensor
- LDR

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## 2. COMPONENT DESCRIPTION

### 2.1 ARDUINO UNO MICROCONTROLLER

Arduino Uno Microcontroller board based on the Microchip ATmega328P microcontroller is used in this project. This board also consists of other components such as crystal oscillator, serial communication, voltage regulator, etc. to support the microcontroller. Arduino Uno has 14 digital input/output pins (out of which 6 can be used as PWM outputs), 6 analog input pins, a USB connection, a Power barrel jack, an ICSP header and a reset button. Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. This board can be interfaced with other Arduino boards, Arduino shields, Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output. Arduino UNO features AVR microcontroller Atmega328, 6 analogue input pins, and 14 digital I/O pins out of which 6 are used as PWM output.

“Uno” means one in Italian and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now evolved to newer releases. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform; for an extensive list of current, past or outdated boards see the Arduino index of boards. The Arduino boards can work as a stand-alone project and can be interfaced with other Arduino boards or Raspberry Pi boards. Arduino UNO board is used in the following applications.

- Weighing Machines
- Traffic Light Count Down Timer
- Parking Lot Counter
- Embedded systems
- Home Automation
- Industrial Automation
- Medical Instrument
- Emergency Light for Railways

### 2.2 SERVO MOTER

In this work a low speed and high torque motor is used. It has four main components - a DC motor, a gearbox, a potentiometer and a control circuit. It is controlled by sending a series of pulses through the signal line. A Servo Motor is a small device that has an output shaft. This shaft can be positioned to specific angular positions by sending the servo a coded signal. As long as the coded signal exists on the input line, the servo will maintain the angular position of the shaft. If the coded signal changes, the angular position of the shaft changes. In practice, servos are used in radio-controlled airplanes to position control surfaces like the elevators and rudders. They are also used in radio-controlled cars, puppets, and of course, robots. Servos are extremely useful in robotics. The motors are small, have built-in control circuitry, and are extremely powerful for their size. A standard servo such as the Futaba S-148 has 42 oz/inches of torque, which is strong for its size. It also draws power proportional to the mechanical load. A lightly loaded servo, therefore, does not consume much energy. The guts of a servo motor is shown in the following picture. You can see the control circuitry, the motor, a set of gears, and the case.

The servo motor has some control circuits and a potentiometer (a variable resistor, aka pot) connected to the output shaft. In the picture above, the pot can be seen on the right side of the circuit board. This pot allows the control circuitry to monitor the current angle of the servo motor. If the shaft is at the correct angle, then the motor shuts off. If the circuit finds that the angle is not correct, it will turn the motor until it is at a desired angle. The output shaft of the servo is capable of traveling somewhere around 180

degrees. Usually, it is somewhere in the 210-degree range, however, it varies depending on the manufacturer. A normal servo is used to control an angular motion of 0 to 180 degrees. It is mechanically not capable of turning any farther due to a mechanical stop built on to the main output gear. The power applied to the motor is proportional to the distance it needs to travel. So, if the shaft needs to turn a large distance, the motor will run at full speed. If it needs to turn only a small amount, the motor will run at a slower speed. This is called proportional control.

### **2.3 LIGHT DEPENDENT RESISTORS (LDR)**

Light Dependent Resistors (LDR), are light sensitive devices most often used to indicate the presence or absence of light, or to measure the light intensity. Light Dependent Resistors (LDR) are also called photo-resistors. They are made of high resistance semiconductor material. When light hits the device, the photons give electrons energy. This makes them jump into the conductive band and thereby conduct electricity. Light dependent resistors, LDRs or photo-resistors are often used in circuits where it is necessary to detect the presence or the level of light. They can be described by a variety of names from light dependent resistor, LDR, photo-resistor, or even photo cell, photocell or photoconductor.

When light falls upon it, then the resistance changes. Values of the resistance of the LDR may change over many orders of magnitude the value of the resistance falling as the level of light increases. LDRs are made from semiconductor materials to enable them to have their light sensitive properties. Many materials can be used, but one popular material for these photo-resistors is cadmium sulphide, CdS, although the use of these cells is now restricted in Europe because of environmental issues with the use of cadmium. Similarly other cadmium based semiconductor materials like cadmium CdSe are also restricted. Other materials that can be used include lead sulphide, PbS and indium antimonide, InSb.

### **2.4 LIQUID CRYSTAL DISPLAY**

The JHD162A 16×2 LCD module used here is based on the HD44780 driver from Hitachi. It can display 2 lines of 16 characters each. The JHD162A has 16 pins and can be operated in 4-bit mode or 8-bit mode. Some important features are given below:

LCD display module with Yellow/Green Backlight

SIZE: 16×2 (2 Rows and 16 Characters Per Row)

Can display 2-lines X 16-characters

Operate with 5V DC

Wide viewing Angle & High Contrast

Commonly Used in fax machines, laser printers, industrial test equipment, networking equipment such as routers and storage devices, Student Project, Collage, copiers. Support All Digital Microcontroller like Arduino,Raspberry Pi,8051,PIC,AVR,ARM,MSP430,STM etc.

### **2.5 DS3231 RTC module**

It is an extremely accurate I<sup>2</sup>C real-time clock (RTC). It incorporates a battery input and maintains accurate timekeeping when the main power to the device is interrupted. The DS3231 is a low-cost, highly accurate Real Time Clock which can maintain hours, minutes and seconds, as well as, day, month and year information. Also, it has automatic compensation for leap-years and for months with fewer than 31 days. The module can work on either 3.3 or 5 V which makes it suitable for many development platforms or microcontrollers. The battery input is 3V and a typical CR2032 3V battery can power the

module and maintain the information for more than a year. The module uses the I2C Communication Protocol which makes the connection to the Arduino Board very easy.

So once we download and install the library we can use its first demo example to initially activate the clock of the RTC module. In the setup section of the demo example code we can notice that there are three line that we need to uncomment in order to initially set the day of the week, the time and the data.

```
// Code from the Demo Example of the DS3231 Library
void setup()
{
  // Setup Serial connection
  Serial.begin(115200);
  // Uncomment the next line if you are using an Arduino Leonardo
  //while (!Serial) {}
  // Initialize the rtc object
  rtc.begin();
  // The following lines can be uncommented to set the date and time
  //rtc.setDOW(WEDNESDAY); // Set Day-of-Week to SUNDAY
  //rtc.setTime(12, 0, 0); // Set the time to 12:00:00 (24hr format)
  //rtc.setDate(1, 1, 2014); // Set the date to January 1st, 2014
}
```

The first line is for setting the day of the week, the second line is for setting the time in hours, minutes and seconds, and the third line is for setting the date in days, months and years. Once we upload this code we need to comment back the three lines and re-upload the code again.

```
// Code from the Demo Example of the DS3231 Library
void loop()
{
  // Send Day-of-Week
  Serial.print(rtc.getDOWStr());
  Serial.print(" ");
  // Send date
  Serial.print(rtc.getDateStr());
  Serial.print(" -- ");
  // Send time
  Serial.println(rtc.getTimeStr());
  // Wait one second before repeating
  delay (1000);
}
```

### 3. BLOCK DIAGRAM

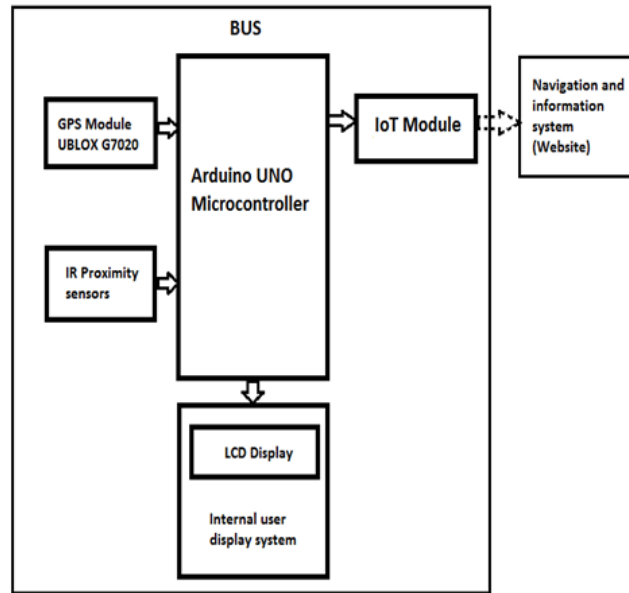


Figure 1 : Block diagram of IoT Based Automatic Bus Stop Shelters

### 4. WORKING OF COMPONENTS

#### 4.1. ARDUINO UNO BOARD:

The user can get started by connecting the Uno to a computer with the USB cable or by powering it with an AC / DC adapter or battery. The Uno can be programmed with Arduino Software (Integrated Development Environment). Arduino Uno features 14 digital input / output pins (six of which can be used as PWM outputs), six analog inputs, and a 16MHz quartz crystal. Uno also includes a USB connection, a power jack, an In-Circuit Serial Programming (ICSP) header, and a reset button. This Arduino MCU board contains everything the user needs to support the MCU.



Figure 2: Arduino UNO Microcontroller module

The Arduino UNO board contains the following components and specifications:

*ATmega328:* This is the brain of the board in which the program is stored.

*Ground Pin:* there are several ground pins incorporated on the board.

*PWM:* the board contains 6 PWM pins. PWM stands for Pulse Width Modulation, using this process we can control the speed of the servo motor, DC motor, and brightness of the LED.

*Digital I/O Pins:* there are 14 digital (0-13) I/O pins available on the board that can be connected with external electronic components.

*Analogue Pins:* there are 6 analogue pins integrated on the board. These pins can read the analogue sensor and can convert it into a digital signal.

*AREF:* It is an Analog Reference Pin used to set an external reference voltage.

*Reset Button:* This button will reset the code loaded into the board. This button is useful when the board hangs up, pressing this button will take the entire board into an initial state.

*USB Interface:* This interface is used to connect the board with the computer and to upload the Arduino sketches (Arduino Program is called a Sketch)

*DC Power Jack:* This is used to power up the board with a power supply.

*Power LED:* This is a power LED that lights up when the board is connected with the power source.

*Micro SD Card:* The UNO board supports a micro SD card that allows the board to store more information.

*3.3V:* This pin is used to supply 3.3V power to your projects.

*5V:* This pin is used to supply 5V power to your projects.

*VIN:* It is the input voltage applied to the UNO board.

*Voltage Regulator:* The voltage regulator controls the voltage that goes into the board.

*SPI:* The SPI stands for Serial Peripheral Interface. Four Pins 10(SS), 11(MOSI), 12(MISO), 13(SCK) are used for this communication.

*TX/RX:* Pins TX and RX are used for serial communication. The TX is a transmit pin used to transmit the serial data while RX is a receive pin used to receive serial data.

#### **4.2. SERVO MOTOR:**

The servo motor is connected to the D8 pin of Arduino. A servo consists of a Motor (DC or AC), a potentiometer, gear assembly, and a controlling circuit. First of all, we use gear assembly to reduce RPM and to increase torque of the motor. Say at initial position of servo motor shaft, the position of the potentiometer knob is such that there is no electrical signal generated at the output port of the potentiometer. Now an electrical signal is given to another input terminal of the error detector amplifier. Now the difference between these two signals, one comes from the potentiometer and another comes from other sources, will be processed in a feedback mechanism and output will be provided in terms of error signal. This error signal acts as the input for motor and motor starts rotating. Now motor shaft is connected with the potentiometer and as the motor rotates so the potentiometer and it will generate a signal. So as the potentiometer's angular position changes, its output feedback signal changes. After sometime the position of potentiometer reaches at a position that the output of potentiometer is same as external signal provided. At this condition, there will be no output signal from the amplifier to the motor input as there is no difference between external applied signal and the signal generated at potentiometer, and in this situation motor stops rotating.



Figure. 3: Servo Motor used in the Work

#### 4.3. LIGHT DEPENDANT RESISTORS (LDR)

The working principle of an LDR is photoconductivity, which is nothing but an optical phenomenon. When the light is absorbed by the material then the conductivity of the material enhances. When the light falls on the LDR, then the electrons in the valence band of the material are eager to the conduction band. But, the photons in the incident light must have energy superior to the bandgap of the material to make the electrons jump from one band to another band (valance to conduction).Hence, when light having ample energy, more electrons are excited to the conduction band which grades in a large number of charge carriers. When the standard, like Wi-Fi, uses the FHSS technique (Frequency-Hopping Spread Spectrum), which involves splitting the frequency band of 2.402-2.480 GHz into effect of this process and the flow of the current starts flowing more, resistance of the device decreases.

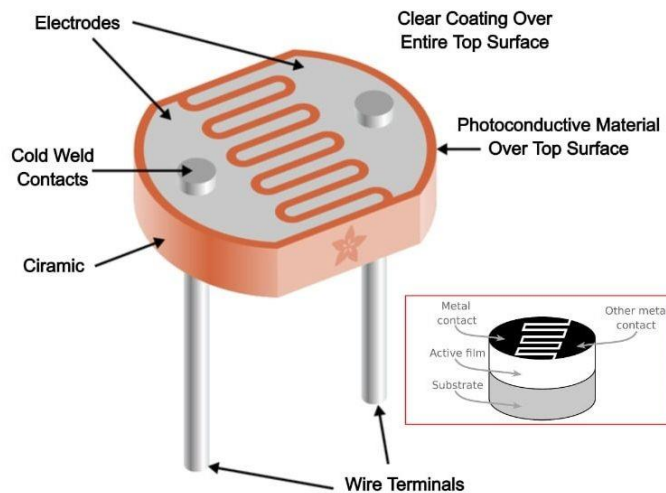
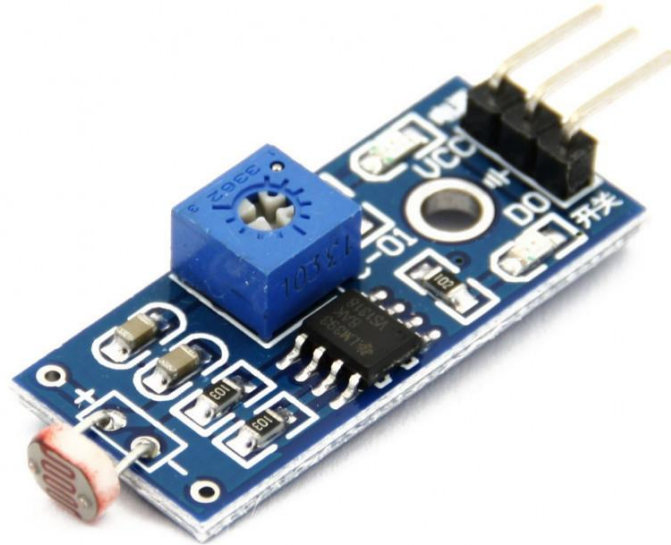


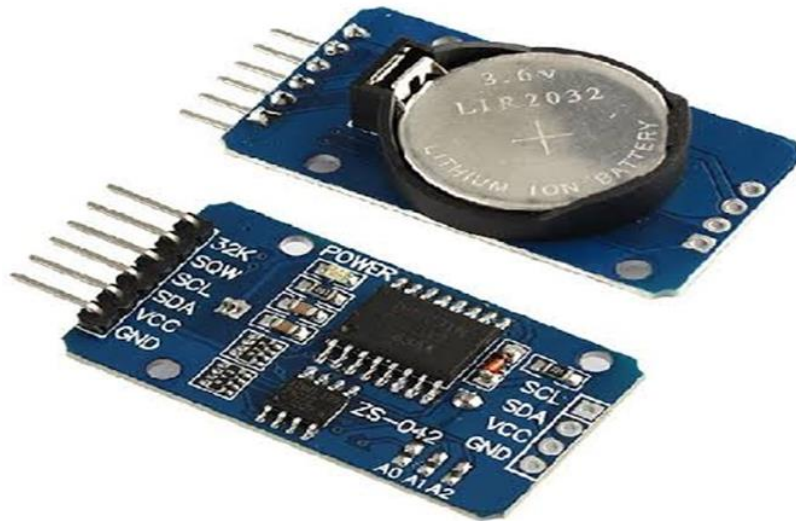
Figure 4: A two terminal Light Dependent Resistor



*Figure 5 : LDR module*

#### 4.4. DS3231 RTC MODULE

The DS3231 is a low-cost, extremely accurate I<sup>2</sup>C real-time clock (RTC) with an integrated temperature-compensated crystal oscillator (TCXO) and crystal. The device incorporates a battery input, and maintains accurate timekeeping when main power to the device is interrupted. The integration of the crystal resonator enhances the long-term accuracy of the device as well as reduces the piece-part count in a manufacturing line. The DS3231 is available in commercial and industrial temperature ranges, and is offered in a 16-pin, 300-mil SO package. The RTC maintains seconds, minutes, hours, day, date, month, and year information. The date at the end of the month is automatically adjusted for months with fewer than 31 days, including corrections for leap year. The clock operates in either the 24-hour or 12-hour format with an AM/PM indicator. Two programmable time-of-day alarms and a programmable square-wave output are provided. Address and data are transferred serially through an I<sup>2</sup>C bidirectional bus. A precision temperature-compensated voltage reference and comparator circuit monitors the status of VCC to detect power failures, to provide a reset output, and to automatically switch to the backup supply when necessary.

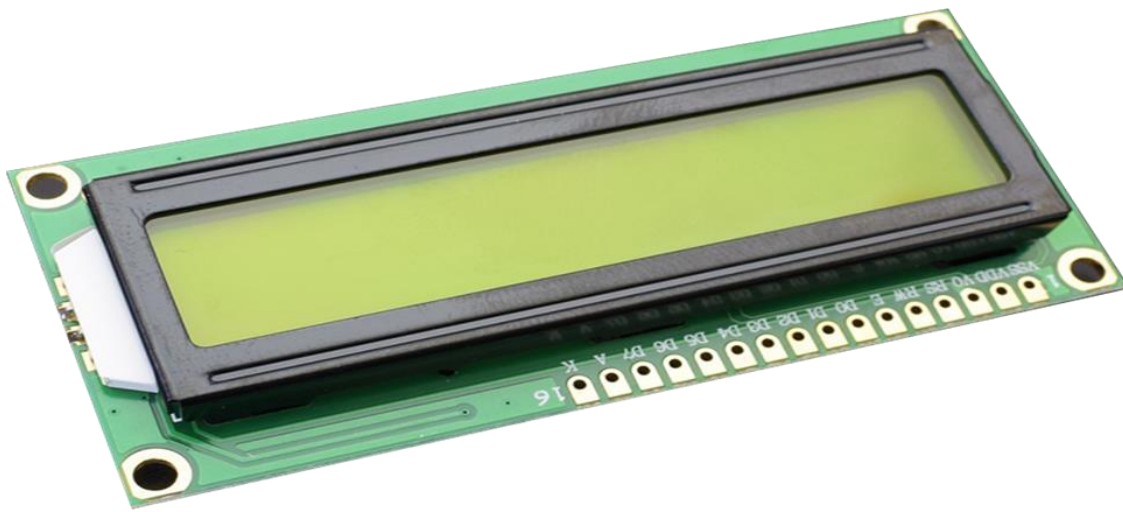


*Figure. 6 : DS3231 RTC Module*

#### 4.5. 16 X 2 LCD

The LCD module is in connection with D8 to D13 pins of Arduino. An LCD (Liquid Crystal Display) screen is an electronic display module and has a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. The 16 x 2 intelligent alphanumeric dot matrix display is capable of displaying 224 different characters and symbols. This LCD has two registers, namely, Command and Data.

Command registers stores various commands given to the display. Data register stores data to be displayed. The process of controlling the display involves putting the data that form the image of what you want to display into the data registers, then putting instructions in the instruction register. In your Arduino project Liquid Crystal Library simplifies this for you so you don't need to know the low-level instructions. Contrast of the display can be adjusted by adjusting the potentiometer to be connected across VEE pin.



*Figure. 7: 16x2 LCD Module*

#### 5. PROGRAM CODE

```
#include<Servo.h> //library for servo motor
#include <DS3231.h> //library for rtc module
#include<LiquidCrystal.h> //library for lcd
Servo myservo; //object created for servo motor
DS3231 rtc(SDA, SCL); //object created for servo motor
LiquidCrystal lcd(13,12,11,10,9,8); //object created for lcd
int rainsen = A0;
int ldr = A1;
int rain,light; //variable created for storing the reading of the rain sensor and ldr
int pos = 0; //servo motor's position, is set to 0 initially
void setup()
{
  Serial.begin(9600); //setting the serial post to 9600
  lcd.begin(16,2); //initiallizing the lcd
  rtc.begin(); //initiallizing the rtc module
```

```

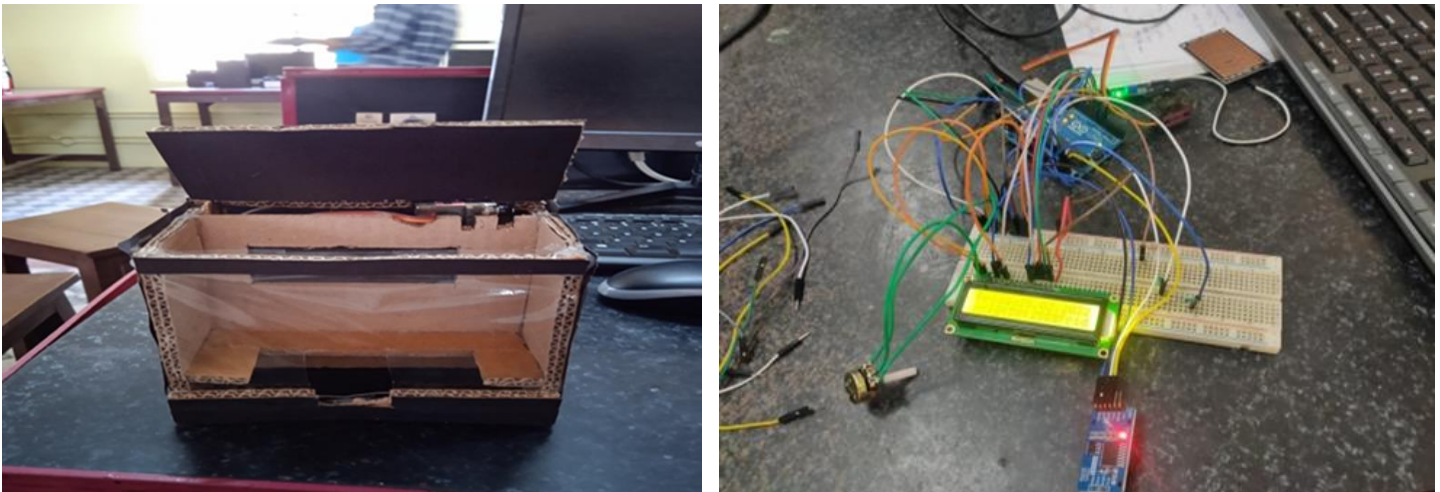
myservo.attach(7);
myservo.write(pos); //setting the servo motor's position
pinMode(rainsen,INPUT); pin mode declarations
pinMode(ldr,INPUT);
rtc.setDOW(THURSDAY); // Set Day-of-Week to SUNDAY
rtc.setTime(11, 42, 0); // Set the time to 11:42:00 (24hr format)
rtc.setDate(10, 7, 2021); // Set the date to October 7th, 2021
}
void loop()
{
  rain = analogRead(rainsen); //assigning the rain sensor input to the created variable
  light = analogRead(ldr); //assigning the ldr input to the created variable
  Serial.print("rain = "); //printing the input values on the serial monitor for error checking
  Serial.println(rain);
  Serial.print("light = ");
  Serial.println(light);
  Serial.println("$$$$$$$$");
  // Send Day-of-Week
  Serial.print(rtc.getDOWStr()); //time, date,and day will be printed on the serial monitor and the lcd display
  Serial.print(" ");
  lcd.clear();
  lcd.setCursor(4,0);
  lcd.print(rtc.getDOWStr());
  // Send date
  Serial.print(rtc.getDateStr());
  Serial.print(" -- ");
  lcd.setCursor (3,1);
  lcd.print (rtc. get DateStr());
  delay (1000);
  // Send time
  Serial.println(rtc.getTimeStr());
  lcd.clear();
  lcd.setCursor (4,0);
  lcd.print(rtc.getTimeStr());
  delay (1000);
  if (rain < 500 || light > 500) //if there is rain or there is heavy sun light
  {
    roofClose(); //calling the roof closing function
  }
  if(rain > 500 && light < 500) //if there is no rain and no heavy sun light
  {
    roofOpen(); //roof opens
  }
}

```

```

void roofClose() //function created for closing the roof
{
  for(pos; pos < 180; pos++)
  {
    myservo.write(pos);
    delay(20);
  }
}
void roofOpen() //function created for opening the roof
{
  for(pos; pos > 0; pos--)
  {
    myservo.write(pos);
    delay(20);
  }
}

```



*Figure. 8: Prototype and testing of circuit on bread Board*

## 6. CONCLUSION

This bus stop is completely smart. Time, date and day will be displayed on the lcd screen for the people. To manage a good amount of air flow, the roof of the bus stop will be open in normal weather conditions. If there is rain or heavy sunlight, the bus stop detects the weather change and closes the roof automatically. In other words, this bus stop is more concerned about the comfort of the people who use it. This is a completely high-tech bus stop. the smart bus stops have provided as a sitting area that can be used while awaiting transportation, as well as shelter from the natural elements like sun, wind and rain. Provide real time transit data like date and time.

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## CHAPTER 11

### ECOFEMINIST READING OF ENDANGERED HABITATS AND LIVES: BARBARA KINGSOLVER'S FLIGHT BEHAVIOUR

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#### **Abstract**

Ecocriticism is a form of literary theory which has evolved as a critical approach in literature. Ecofeminism is a division of ecocriticism, a part in fact which essentially projects at the aspect that females tend to be more caring and feel one with nature. The novel *Flight Behaviour* by Barbara Kingsolver reflects how Appalachian Mountains are exploited environmentally by power dynamics and existent anthropogenic behaviour of man. The novel relates to the environmental degradation within the Appalachian region where coal and coal-related environmental degradation is taking place. This paper focusses on concerns related to biodiversity, deforestation, human usage of animals and the impending climate disasters. The novel moulds together fact with fiction – climate change with emotional characters like Dellarobia which intersect with other characters in daily lives. This paper analyses through the central protagonist, Dellarobia, and foresees how humans subject the nonhumans to a wrecking capitalist system of exploitation and anticipates the impending disastrous future. The paper looks into how scientists like Dr Byron deal with the destruction of the habitat of the butterflies and the new migration taken up by the monarch butterflies as research work but are unaware of the impending future. The paper presents various hazards brought about by anthropocentric practices which should be minimized since interdependence of species should be recognized to have a hopeful future.

**Keywords:** *Ecofeminism, Ecological concerns, Exploitation, Climate change, Anthropocentric practices, Anticipation*

**E**cocriticism is a form of literary theory which has evolved as a critical approach in literature. Ecocriticism addresses the problems and consequences of human action on the environment and hence projects the essential aspects of the future of the planet earth. Ecocriticism thus expands the world of literature to include the entire ecosphere along with its study of other texts and society. Ecocriticism agrees with Barry Commoner's law of ecology that "everything is connected to everything else" (Glotfelty, 1996, p. xix) and that literature is connected not only to the material world but an aesthetic natural world order too. Ecocriticism studies various new possibilities such as waste studies, toxic studies, dystopian studies, anthropogenic studies etc which helps to look critically and dig into the root cause of climate changes. Ecocriticism always portrays the binaries human and nature as equally important for existence. Ecofeminism is a division of ecocriticism, a part in fact which essentially projects at the aspect that females tend to be more caring and feel one with nature. According to Greta Gaard (2011) in her review

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article “Ecofeminism Revisited: Rejecting Essentialism and Species in a Material Feminist Environmentalism”, reflects on how ecofeminism grew out of feminism in the 1970s and 1980s but Carol Adams in her anthology *Ecofeminism: Feminist Intersections with Other Animals and the Earth* (2014), looks at the evolution of animal rights activism and contributing of females to the protection of non-human species.

Adams’s *Ecofeminism* (2014) also reflects on the essentials of ecofeminism:

[T]he intersectional analysis of nature, gender, race, class, species, and sexuality is not confined to an essentialist definition of feminism or ecofeminism, but rather offers a strategic conceptual approach toward bringing about the social justice, economic and ecological democracy needed to solve environmental crises in the present moment” (qtd. in Adams, p. 31).

Ecofeminism also questions the power dynamics and domination existent in the social and political structure, critiquing fictional representations through introduction of characters which stands useful in the analysis of literary works contributing to the thought process of readers.

The novel *Flight Behaviour* by Barbara Kingsolver reflects how Appalachian Mountains are exploited environmentally by power dynamics and existent anthropogenic behaviour of man. The novel relates to the environmental degradation within the Appalachian region where coal and coal-related environmental degradation is taking place. This paper focusses on the concerns related to biodiversity, deforestation, human usage of animals and the impending climate disasters. The novel moulds together fact with fiction – climate change with emotional characters like Dellarobia which intersect with each other in daily lives. Ecofeminism addresses human selfishness as the major cause in modern culture. “Ecofeminism addresses the various ways that sexism, heteronormativity, racism, colonialism, and ableism are informed by and support speciesism and how analysing the ways these forces intersect can produce less violent, more just practices” (Adams, 2014, p.1).

Anthropocentrism has become more centralized which involves ecologies to have binaries. However, ecological thinkers avoid being binarized which promotes dominates Western thought. Ruether presents the identification of women with a non-human world in a highly symbolic manner along with the socio-economic condition when he:

[G]oes beneath the cultural-symbolic level and explores the socio-economic underpinnings of this ideology of women’s similarity to non-human nature. How has the domination of women’s bodies and women’s work by ruling class men been interconnected concretely with the exploitation of land, of water, or animals? [...] How does the positioning of women as the caretakers of children, and of small animals, the gatherers of plants, the weavers, the cooks, the cleaners, the waste managers for men in the family, function to both inferiorize this work and to identify women with a non-human world that is likewise inferiorized? (qtd. in Adams, 2014, p. 11)

Women, world over are woven into the false narrative that they are the caretakers, the gatherers, the weavers, the house keepers etc. The dominant nature/culture existent in all cultures all over the world shows the men as superiors and women as inferiors. Similar is the nature/culture binary where culture is associated with men and women with nature. Patriarchal structures is innate in most of the cultures of the world. Gaard (2011) says, “Ecofeminism emerged from the intersections of feminist research and the various movements for social justice and environmental health, explorations that uncovered the linked oppressions of gender, ecology, race, species, and nation” (p. 28). Women have an innate response to the problems and consequences existent in life and hence are closer to nature.

Val Plumwood in *Feminism and the Mastery of Nature* (1993) reflects upon the use of evaluation and reflection on what humans are trying to dominate with their anthropocentric attitude and try to

understand the women critique: Nature, as the excluded and devalued contrast of reason, includes the emotions, the body, the passions, animality, the primitive or uncivilised [sic], the nonhuman world, matter, physicality and sense experience, as well as the sphere of irrationality, of faith and of madness. In other words, nature includes everything that reason excludes. It is important to note this point because some ecofeminists have endorsed the association between women and nature without critically examining how the association is produced by exclusion. (p. 20)

The novel *Flight Behaviour* need to be evaluated by the background of the landscape i.e., the Appalachian region. As Fred Chappell in his interview to Palmer points to the existent condition of the region one can fairly understand that:

There is an Appalachian literature distinct from southern literature, mostly because the economic and social conditions are different in the two areas.... What you're going to be concerned with, perhaps more than the southern writer, is the impact of technology and industrialization on the ecology—the nuclear industry in Oak Ridge, the Champion Paper Mill in Canton, canneries—that kind of thing. And also, the coming of the highway system, which made a difference of a kind in the mountains that didn't occur in other places. (Palmer, 1994, p1)

The ecosystem of the Appalachian region is under the cover of pollution from the excessive use of industrialization and technology resulting in coal mining, mountain top forest removal etc. The pleasant surroundings of the region have been deteriorated to unpleasant regions putting human health at high risk. The capitalist government like those around the world seeks profits exploiting and extracting the natural resources of the region and patriarchal power structures support such practices.

Barbara Kingsolver's *Flight Behaviour*, was published in 2012 and is set in the region of the Appalachian Mountains. The central protagonist, Dellarobia's story is narrated in the entire novel. Dellarobia tries to make sense of what is happening around her and her home. She is filled with grief since she doesn't get any love or support from her in-laws and her husband, Cub. The novel presents climate change in a fictive manner with an ecofeminist lens. Dellarobia interacts with Byron and his assistants and gains a scientific opinion about the exploitation of land by human practices. The scientists who are Byron's team of researchers travelled to Tennessee study the butterflies' nature not with the religious mindset of the natives but as an important ecological condition to be analysed:

Lone individuals dropped from the trees steadily like insect rain, trembling where they landed and taking their time to die. She [Dellarobia] wondered if this was a butterfly funeral, but you'd not know it from this science crew. They seemed in a fine mood, just getting down to business with their tape measures, plastic sheeting, boxes of waxed-paper envelopes, and smaller instruments she couldn't name. (Kingsolver, 2012, p. 139)

Dellarobia is married at a young age into a patriarchal family. At the end, she had to leave her family of the in-laws realising that she had to stand for herself. Males like Bear Turnbow treat land very cruelly and show anthropocentric attitude. Dellarobia, spends most of her time recognises the interrelation between animals, humans and nature. The entire novel has representation of natural ecologies spoiled by the gendered responses and indifferent practices toward nature. Failed progeny, failed agricultural practices, and unpredictable futures caused by climate changes occupy the main concepts in the novel which are associated to the weak newborn lamb and miscarriages of the female gender. Val Plumwood cautions against the distorted relations of binaries and dualities that degrade women and nature as she says in her work *Feminism and the Mastery of Nature* (1993): "We do not have to assume that nature is a sphere of harmony and peace, with which we as humans will never be in conflict. A rejection of the western treatment of nature implies a careful, critical and political look at the category of nature" (p. 37).

Human beings continue to dethrone nature's capability of healing but forget that it is exhaustible. Anthropocentric opinion allows man to dominate and control nature and its behaviour. Man has become indifferent to the plight of the other that is the animals and nature. Dellarobia becomes somewhat like a scientist, although uneducated and young in age. She comes out of the trap of early marriage to a low wage farmer and construction worker, Cub. Dellarobia becomes an advocate for the environmental hazard showing winds of change or anticipation, a hope for remediation. The family and society around Dellarobia can see the effects of climate change when they can understand the monarchs' new flight path and assign it to a miracle. Kingsolver suggests the considerations for climate change when she responds to an interviewer with *Time*:

Our agriculture here has gone through one disaster year after another, so climate change is not some kind of abstract future threat here. It is literally killing our farm economy. We've had record heat years. We've had record drought years. So, the people most affected by climate change already are people among whom I live: rural conservative farmers. And it strikes me that these are the same people who are least prepared to understand and believe in climate change and its causes. Our local politicians are quite deliberately misinforming us and fighting every kind of environmental regulation that could possibly slow down the release of carbon for the very obvious reason that they're beholden to the big player in this region, which is the coal companies. Here we are, caught between the devil and the deep blue sea. What can I do but write a novel? (Walsh, 2012, n.pag)

One can reflect on the condition of the rural farmers who have been most affected by climate change and still they have not been provided much support due to which even today many farmers commit suicide. Farmers have also been killed in India. It's a common problem existent all over for those connected with the land.

Byron, the scientist is the only man in the novel who doesn't take part in the exploitative use of land and knows the realities of climate change even his team of researchers are unaware of the impending disaster. Dellarobia realizes the impending disaster and that she can't escape climate change since it is real and affects their very survival. The novel announces that future generations are at high risk and might have to shift to other places in search of resources like the monarchs (butterflies) which had to shift their habitat and nesting grounds to preserve their endangerment. The conditions of the human beings after depletion of natural resources are compared to that of the monarchs and the difficult births in the novel. Dellarobia experience with Hester, her father-in-law's birthing lambs makes her to accept the death of her and Cub's child. The comparison between humans and nonhumans is important as ecofeminist critique mirrors the future of common reproductive success in the face of climate change which is very bleak.

Dellarobia comes to terms with ecological disasters happening both in Tennessee and in Mexico. She loves her children but her husband's family repress her mental condition. She lives with her husband after the death of her baby on a part of the farm land that Hester and Bear (Cub's parents) own and keep them both out of the financial decisions taken by Hester. Hester takes a loan and puts a part of Dellarobia's part of the farm without her knowledge. Women are not considered insiders for taking family decisions by males. Her husband seems ineffective to take decisions and voice his opinion to Hester. Logging the mountaintop of trees would get enough money to keep their farm as Bear says. The townsfolk see the arrival of the butterflies and talk of them as signs from God.

*The family continues with their contract:*

Bear's signed the contract.... He says he's going ahead with it, rain or shine. King Billies [butterflies] or no King Billies. Now see, I don't know why they couldn't wait a month or two and see what

happens. I pray about it every day... [but you] were the first to pay attention.... He and Peanut Norwood won't give an inch.... I don't think it's just the money. I mean, it is the money. But to be in such a rush over it, not listening to anybody. I think they've put each other up to that. A man-to-man kind of thing. (Kingsolver, 2012, p. 133).

Dellarobia is the one who thinks that the mountainside is on fire seeing the monarch butterflies. She meets the press, attends interviews and eventually gets introduced to Dr Byron who came to study monarchs which are no longer migrating to their native home.

Ecofeminist approach allowed Dellarobia to gain a perception of nature. She could see the bond between the human and the nonhuman, which is adopted by the ecofeminist perspective. She could foresee how humans subject the nonhumans to a wrecking capitalist system. Humans are always related to the ecosystem and environment and any struggle against the order of things of nature would result in floods and devastation. Dellarobia is marked on thinking of a futuristic deforested mountain top; her intuition reminds her how man has grown in retaliation against man, man against himself and man against nature. The disturbance in the environment would certainly lead to drastic consequences of various elements in nature. The monarch butterflies shift their migration path only because of the heavy deforestation on the mountain top. The butterflies are deprived of their natural habitat just like wild animals being endangered due to forests being turned into urbanized landscapes. Preston, her child has a close friend Josefina at school whose family moved to the new location from the mountaintop. Dellarobia finds out after "some looking on the Internet about the town in Mexico where Preston's little friend [Josephina] and her family lost their home, and logging was a part of it. They had clear-cut the mountainside above the town, and that was said to have caused the mudslide and floods when a hard rain came" (Kingsolver, 2012, p. 137-138).

The family of Josephina had to migrate because they belonged to the minority in Tennessee town. Humans' decision to cut down trees on the mountaintop had in fact led to mudslides which affected houses, humans and butterflies all alike. Relocation is seen usually by the poor who fail to face the hardships imposed not by nature in the beginning but by patriarchal, dominant male attitude which doesn't foresee the consequences and disaster which is ready to attack.

The research team of Dr Byron sees the destruction of the habitat of the butterflies and the new migration taken up by the monarch butterflies as research work. In the beginning, Dellarobia has assorted religious affinities to the orange of the monarchs as a sign of God, guidance for her lost soul but quickly she could ascertain the altered migration routes as a despairing fight for survival and search for a new habitat. She is hypnotised by the thought of the monarchs:

Not just an orange passage across a continent as she'd imagined it before, not like marbles rolling from one end of a box to the other and back. This was a living flow, like a pulse through veins, with the cells bursting and renewing themselves as they went. The sudden vision filled her with strong emotions that embarrassed her. (Kingsolver, 2012, p. 146)

She began to see the butterflies also as individuals, a part of nature, a part of the nonhuman species. She understands the complicated capitalistic stronghold of the government and its working. She resents those who fail to educate themselves of the effects of the butterfly migration. Dellarobia says:

These butterflies had been hers. She found them, she'd showed them to her son, in her name they were becoming beloved and important. They seemed to matter, like nothing she'd ever possessed. Already she had made up her mind to throw her one hundred dinky pounds against the heft of her family's men, if it came to that" (Kingsolver, 2012, p. 149).

Dovey doesn't think about the complications and consequences and says: "Now see...that's a woman thing. Men and kids get to just light out and fly, without ever worrying about what comes next."

(Kingsolver, 2012, p. 190) But Dellarobia posits, “No, Dovey, it’s an everybody thing. It’s just a question of how well you can picture the crash landing” (Kingsolver, 2012, p. 190). Dovey has a small scope in understanding while Dellarobia thinks in broad terms, reflecting upon the interconnectivity of all things, a cosmic effect, which would lead to dystopian consequences.

*Murphy (1995) points out that:*

this clear-cutting is just one example of short-term and short-sighted solutions to systemic economic problems. It also becomes an example of how people can be persuaded by the consumerist culture in which they live to make decisions that run counter to their own personal long-term interests, as well as the long-term health of their human communities, their ecoregional communities, and the biosphere (p.159).

The writer and her novel voices out the complexity of the politicians who encourage clear-cutting which would save the farm without heeding that farming would be useless if climate turns violent and drastic. Humans don’t acknowledge that devastation on this planet is only created by them than any other nonhuman factor.

Ecofeminists seek to create harmony diffusing the indifferent mindsets and showcase the environmental inequities. In an interview to *Time* magazine Kingsolver said *Flight Behaviour* was written: “because I wanted to write about that particular culture war (global warming). I live in Southern Appalachia and I am surrounded, literally, my home is surrounded by farms and by coal mines. Our agriculture here has gone through one disaster year after another, so climate change is not some kind of abstract future threat here. It is killing our farm economy. We have had record heat years... Here we are, caught between the devil and the deep blue sea.” (Wagner, 2014, p. 19)

The novel ends on an open note: “The sky was too bright and the ground so unreliable, she couldn’t look up for very long. Instead, her eyes held steady on the fire bursts of wings reflected across water, a merging of flame and flood. Above the lake of the world, flanked by white mountains, they flew out to a new earth” (Kingsolver, 2012, p. 433). The novel focusses on climate change and its effects through Dellarobia’s character where women realise the condition of both themselves and the exploitation of the landscape.

## **Conclusion**

Dellarobia voices out her concern on the plight of the monarch butterflies while Cub strangely replies without feeling: “There’s always some place else to go” (Kingsolver, 2012, p. 172). Dellarobia is astonished and thinks, “And what if there was no other place?” (Kingsolver, 2012, p. 175). Climate change and environmental disasters leave behind them unerasable marks where they leave no place for humans to escape. Human beings should accept that both human and nonhuman forms of life are important and the dualistic concept of existence and interdependence can’t be left out but reinforced to bring in change in the mindset of individuals. Val Plumwood (1993) describes: “[B]oth men and women must challenge the dualised conception of human identity and develop an alternative culture which fully recognises *human* identity as continuous with, not alien from, nature. The dualized conception of nature as inert, passive and mechanistic would also be challenged as part of this development” (p. 36). A new culture should be embraced which resists any dualism and one aspect human or nonhuman form as it is, as it can’t exist by itself and hence needs to be taken care of, as both aspects are juxtaposed. This novel critiques anthropocentrism and leads to the concept that exploitative environmental practices will devastate human life in the long run. Any compromise to avoid understanding the interdependence of existence would lead to a dystopian future. Hence, there is a need to anticipate the enormity of the ecological devastation which

would lead to a happy planet of successful future generations. Anthropocentric practices should be minimized and interdependence of species recognized to have a hopeful future.

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## CHAPTER 12

### MOTHER TINCTURES AND DILUTIONS IN HOMOEOPATH

***Dr. Qureshi Naheed Muzaffaruddin***<sup>1</sup>

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***Content :***

Mother tincture refers to herbal extracts

A mother tincture contains the lowest possible potency of any particular homoeopathic preparation

Mother tinctures have fast action and they remain effective for a long time.

The mother tincture is not a crude dose but the initial potency made from the crude drug substance

Even though the mother tincture contain material doses of active principle they are having a power higher than the crude extract

When the mother tincture is judiciously applied it will not spoil the case.

The first medicine in homoeopathy was also a tincture of cinchona .

Homoeopathic medicines are obtained from a precise and controlled process of successive dilutions

‘Like cures like’ something that in large doses creates the symptoms of disease will in small doses treat it.

Extreme dilution enhances the medicine healings properties and eliminates undesirable side effects.

The more a biologically active substance is diluted the more potent it becomes

The most powerful homoeopathic drugs are the ones that according to some homoeopaths have to be used the most carefully ,are the ones that do not even contain a single molecule of the original substance

Active preparations were made by repeated dilutions of original extract

Hahnemann was not bothered by the effect that at these dilutions none of the original substance remained he claimed that the power of the curative solution did not come from the presence of an active ingredient but from the fact that the original substance had in some mystical way empowered the solution with curative properties

A simple dilution however was not enough the vial had to be stuck against a special leather pillow a fixed number of times to be dynamized before adding a drop of the solution to sugar pill.

Mother tincture have direct actions unlike dilutions which act by stimulating body’s own defense mechanism

All the dilutions are derived from a mother tincture which is a solution of the source substance and alcohol.

Mother tincture is the fresh form of making where as by dilution it becomes more potent.

The progress of mother tinctures immediately since the act on the physiological level

Mother tincture is the primary solution in the homoeopathy and liquid solutions are potentized or diluted version of primary solutions.

Mother tincture is safe because of the lowest potency compared to other medicines and is a tincture that is less diluted .

The mother tincture is a sure indication with minimal failure and reaction

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Eg. Rauwolfia serpentina for high blood pressure  
Cochleas armoracia for dandruff .

### Homeopathic dilution

In homeopathy, homeopathic dilution (known by practitioners as "dynamisation" or "potentisation") is a process in which a substance is diluted with alcohol or distilled water and then vigorously shaken in a process called "succussion". Insoluble solids, such as quartz and oyster shell, are diluted by grinding them with lactose (trituration). The founder of homeopathy, Samuel Hahnemann (1755–1843), asserted that the process of succussion activated the "vital energy" of the diluted substance, and that successive dilutions increased the "potency" of the preparation, although other strands of homeopathy (such as Schuessler's) disagreed. The concept is pseudoscience because, at commonly used dilutions, no molecules of the original material are likely to remain. Therefore high homeopathic dilutions must be distinguished from low dilutions where there can be an overlap with herbal medicine.

### Background

The founder of homeopathy, Samuel Hahnemann found that undiluted doses caused reactions, sometimes dangerous ones, so specified that preparations be given at the lowest possible dose. To counter the reduced potency at high dilutions he formed the view that vigorous shaking by striking on an elastic surface – a process termed succussion – was necessary. It has been said that Hahnemann came to this conclusion after deciding preparations subjected to agitation in transit, such as in saddle bags or in a carriage, were more "potent". Hahnemann had a saddle-maker construct a special wooden striking board covered in leather on one side and stuffed with horsehair. The process of dilution and succussion is termed "dynamization" or "potentization" by homeopaths. In industrial manufacture this may be done by machine. There are differences of opinion on the number and force of strikes, and some practitioners dispute the need for succussion at all. There are no laboratory assays and the importance and techniques for succussion cannot be determined with any certainty from the literature.

### Potency scales

Three main logarithmic dilution scales are in regular use in homeopathy. Hahnemann created the "centesimal" or "C scale", diluting a substance by a factor of 100 at each stage. There is also a decimal dilution scale (notated as "X" or "D") in which the preparation is diluted by a factor of 10 at each stage. The centesimal scale was favoured by Hahnemann for most of his life, although in his last ten years Hahnemann developed a quintamillesimal (Q) scale which diluted the drug 1 part in 50,000. The greatest dilution reasonably likely to contain at least one molecule of the original substance is around 12C. A 2C dilution requires a substance to be diluted to one part in one hundred, and then some of that diluted solution diluted by a further factor of one hundred. This works out to one part of the original substance in 10,000 parts of the solution.

A 6C dilution repeats this process six times, ending up with the original material diluted by a factor of  $100-6=10-12$ . Higher dilutions follow the same pattern. In homeopathy, a solution that is more dilute is described as having a higher potency, and more dilute substances are considered by homeopaths to be stronger and deeper-acting. The end product is often so diluted that it is indistinguishable from the dilutant (typically ethanol or pure water for liquids, milk sugar for insoluble solids). Hahnemann advocated 30C dilutions for most purposes (that is, dilution by a factor of 1060). Hahnemann regularly used dilutions up

to 300C but opined that "there must be a limit to the matter". A solution that is more dilute is described as having a higher "potency", and more dilute substances are considered by homeopaths to be stronger and deeper-acting.

In Hahnemann's time it was reasonable to assume that preparations could be diluted indefinitely, as the concept of the atom or molecule as the smallest possible unit of a chemical substance was just beginning to be recognized. We now know that the greatest dilution that is reasonably likely to contain one molecule of the original substance is 12C, if starting from 1 mole of original substance (see Avogadro constant for justification).

Some homeopaths developed a decimal scale (D or X), diluting the substance to ten times its original volume each stage. The D or X scale dilution is therefore half that of the same value of the C scale; for example, "12X" is the same level of dilution as "6C". Hahnemann never used this scale but it was very popular throughout the 19th century and still is in Europe. This potency scale appears to have been introduced in the 1830s by the American homeopath Constantine Hering.[20] In the last ten years of his life, Hahnemann also developed a quintamillesimal (Q) or LM scale diluting the drug 1 part in 50,000 parts of diluent.[21] A given dilution on the Q scale is roughly 2.35 times its designation on the C scale. For example, a preparation described as "20Q" has about the same concentration as one described with "47C".

Potencies of 1000C and above are usually labelled with Roman numeral M and with the centesimal 'C' indicator implied (since all such high potencies are centesimal dilutions): 1M = 1000C; 10M = 10,000C; CM = 100,000C; LM (which would indicate 50,000C) is typically not used because of confusion with the LM potency scale.

The following table is a synopsis comparing the X and C dilution scales and equating them by equivalent dilution. However, the homeopathic understanding of its principles is not explained by dilution but by "potentisation", hence one can not assume that the different potencies can be equated on the basis of equivalence of dilution factors.

X Scale	C Scale	Ratio	Note
1X	1:10	described as low potency	
2X	1C	1:100	called higher potency than 1X by homeopaths
6X	3C	10 <sup>-6</sup>	
8X	4C	10 <sup>-8</sup>	
12X	6C	10 <sup>-12</sup>	
24X	12C	10 <sup>-24</sup>	Has a 60% probability of containing one molecule of original material if one mole of the original substance was used.
26X	13C	10 <sup>-26</sup>	If pure water were used as the diluent, no molecules of the original solution remain in the water.
60X	30C	10 <sup>-60</sup>	Dilution advocated by Hahnemann for most purposes: on average, this would require giving two billion doses per second to six billion people for 4 billion years to deliver a single molecule of the original material to any patient.
400X	200C	10 <sup>-400</sup>	Dilution of popular homeopathic flu preparation Oscillococcinum

Note: the "X scale" is also called "D scale". 1X = 1D, 2X = 2D, etc.

## Dilutions

Serial dilution of a solution results, after each dilution step, in fewer molecules of the original substance per litre of solution. Eventually, a solution will be diluted beyond any likelihood of finding a single molecule of the original substance in a litre of the total dilution product. The "Korsakovian" method may also be used. In the Korsakovian method the vessel in which the preparations are manufactured is emptied, refilled with solvent, with the volume of fluid adhering to the walls of the vessel deemed sufficient for the new batch.[5]:270 The Korsakovian method is sometimes referred to as K on the label of a homeopathic preparation. Another method is Fluxion, which dilutes the substance by continuously passing water through the vial. Insoluble solids, such as granite, diamond, and platinum, are diluted by grinding them with lactose ("trituration").

**The molar limit**

If one begins with a solution of 1 mol/L of a substance, the dilution required to reduce the number of molecules to less than one per litre is 1 part in  $1 \times 10^{24}$  (24X or 12C) since:  $6.02 \times 10^{23} / 1 \times 10^{24} = 0.6$  molecules per litre

Homeopathic dilutions beyond this limit (equivalent to approximately 12C) are unlikely to contain even a single molecule of the original substance and lower dilutions contain no detectable amount. ISO 3696 (Water for analytical laboratory use) specifies a purity of ten parts per billion, or  $10 \times 10^{-9}$  — this water cannot be kept in glass or plastic containers as they leach impurities into the water, and glassware must be washed with hydrofluoric acid before use. Ten parts per billion is equivalent to a homeopathic dilution of 4C.

Critics and advocates of homeopathy alike commonly attempt to illustrate the dilutions involved in homeopathy with analogies.

An example given states that a 12C solution is equivalent to a "pinch of salt in both the North and South Atlantic Oceans", which is approximately correct.

One-third of a drop of some original substance diluted into all the water on earth would produce a preparation with a concentration of about 13C.

A popular homeopathic treatment for the flu is a 200C dilution of duck liver, marketed under the name Oscillococcinum. As there are only about 1080 atoms in the entire observable universe, a dilution of one molecule in the observable universe would be about 40C. Oscillococcinum would thus require 10320 times more atoms to simply have one molecule in the final substance.

Another illustration of dilutions used in common homeopathic preparations involves comparing a homeopathic dilution to dissolving the therapeutic substance in a swimming pool. There are on the order of 1032 molecules of water in an Olympic-size swimming pool and if such a pool were filled entirely with a 15C homeopathic preparation, to have a 63% chance of consuming at least one molecule of the original substance, one would need to swallow 1% of the volume of such a pool, or roughly 25 metric tonnes of water. The high dilutions characteristically used are often considered to be the most controversial and implausible aspect of homeopathy.

**Proposed :**

Homeopaths maintain that this water retains some "essential property" of the original material, because the preparation has been shaken after each dilution.

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## CHAPTER 13

### AGEING IN INDIA : CONSEQUENCES AND SOCIAL WORK RESPONSE

*Dr. Sunil Choudhary*<sup>1</sup>

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#### **Abstract**

The elderly population is expected to increase to about 300 million by 2030. The support system both in terms of institutional and welfare programs are not sufficient enough in India, therefore, the changes occurring in the traditional family and social patterns will create serious problems and challenges for ageing in India. The demographic context is completely presented in this article which clearly explains the growth of the aged population during the census 2011. The article put an emphasis on psychological, sociological and biological theories of ageing. The article also presented a complete perspective on the various problems and issues faced by elderly people. There are various programs and schemes launched by the government for the benefit of elderly and aged population and the brief about schemes are precisely depicted in this article. As the article is prepared from the social work perspective, the required social work approach and interventions are mentioned in this article to address the challenges and issues faced by elderly.

*Key words: Elderly, Ageing, Support, Problems, Psychosocial, Biological, Social work, Intervention*  
*Introduction*

**A**ge is not just about the number of years a person has lived or the various physiological changes s/he undergoes in the course of life but is a product obtained by a mixture of social expectations and norms that are applicable to each of the life stages. Age reflects the rich experiences of life which moulds us into what we are. Experiences during ageing are largely dependent on gender, social class, race and various additional social factors.

Ageing needs to be understood from numerous perspectives even though it is considered a biological process. For example, retirement from work is economic perspective while perception of society members is social criterion to define ageing. Generally, the age of retirement is considered to be a significant benchmark for identifying a person as aged but it differs across countries and is not systematic even within the countries. 65 years is the age of retirement in Germany while in the USA, it is 65 for males and 60 for females. Retirement age varies in India from state to state. It is 56 years in Kerala while 60 years in Rajasthan (Central Statistics Office, 2011).

Lately the concept of 'population ageing', which means older people making up a proportionately greater share of the overall population, is worrying the policy makers around the world (Balamurugan, J. & Ramatritham G. 2012).

It is expected to implicate various problems in developed, developing and underdeveloped countries, one of the major concerns is the declining birth rate coupled with increased life expectancy.

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Systematic analysis of the care of aged persons needs to be done as elderlies living longer and houses getting congested is a cause of stress among families. In families where elder people are living along, they are residing in isolation and are feeling marginalized due to changed lifestyles of younger members and generation gap.

In Indian families, older people used to enjoy respectable positions in traditional societies. Family has always been an important institution in Indian culture and joint families have been a dominant part of our ancient system. Elderly care was not an issue when the families were joint (Jamuna D, 2000). Younger generations used to take care of the economic and social security of the older people which was considered a duty by them.

Migration across the world for economic reasons changed societies and systems of families to a large extent. In contemporary India, it can no longer be taken as granted that elderlies will be taken care of by their family members. Changes in the roles of women have also reduced the prospects of care for elderlies due to reduced availability of caregivers (Bali, A. 1997).

According to a report published (Subaiya, L. & Bansod, D. W. 2014) which found out -

“India’s population is likely to increase by 60 per cent between 2000 and 2050 but the number of elders, who have attained 60 years of age, will shoot up by 360 per cent and the government should start framing policies now else its consequences are likely to take it by surprise. India has around 100 million elderly at present and the number is expected to increase to 323 million, constituting 20 per cent of the total population by 2050.”

### Demography

Shift in age structure towards older age is known as population ageing or demographic ageing. Decline in mortality rate and transition of global fertility is the most prominent trend of global demography of the 21st century. This type of ageing is rapidly progressing in industrialized countries (Rajan Irudaya. S. 2006). The concept of ageing will affect the entire world as it is coupled with various health and socio-economic consequences. India is soon to become a nation with the highest proportion of aged population.

With the help of the table, percentage growth of the population above 60 years will be understood. It can be seen that during the census of 1961, population growth of aged people was 5.63% which consistently increased with time and reached 8.3% during 2011 census. The percentage share seems small but the actual numbers are 24 million in 1961 to 90 million in 2011.

Percentage Distribution of Aged 60 years and above by gender and Place of Residence in India, 1961 – 2011

Census Year	Total	Gender		Place of Residence	
		Male	Female	Rural	Urban
1961	5.63	5.46	5.80	5.82	4.73
1971	5.97	5.94	5.99	6.21	4.97
1981	6.32	6.23	6.41	6.83	5.36
1991	6.70	6.69	6.71	7.10	5.75
2001	7.44	7.09	7.82	7.74	6.70
2011	8.30	7.98	8.63	8.57	8.04

Source: Registrar General & Census Commissioner, India (2011)

**Stages of life**

With the increase in age, people undergo varied stages of phases of life. It becomes helpful in understanding aging through these phases. Period of birth to death is considered a life course, which also includes predictable events of life like physical maturation. Every phase of life brings different expectations and comes with different responsibilities varying by culture and the individual himself.

- **Children** love playing and learning and they look forward to reaching preteens. They are anxious to achieve teenage-hood when preteens period start testing their independence.
- **Teenagers** become eager to enter adulthood by anticipating its challenges and promises.
- **Adults** are occupied in raising families, ambitioning their careers and exploring the world from the lens of an independent individual. Eventually, innumerable adults anticipate old age as a great opportunity for enjoying life without much strain from family and work front.
- **Old age** entails joys of parenthood without much of the hard work that is actually put in during parenthood. People believe that during old age they would explore activities and hobbies which couldn't be followed earlier due to lack of time. But many people do not look forward to old age. They fear becoming old and would go to any limits to avert naturally growing old by seeking cosmetic and medical fixes. Different people have different views regarding old age which largely depend on the cultural norms and values in which people have been socialized.

Levels of dependency and independency change through different stages of life course. After birth, infants are totally dependent on the adults for everything. When they grow to become toddlers and then teenagers to adolescents, they long for more independence while aging. Children are considered to be adults gradually accountable for their lives, although its occurrence depends on the individuals, their cultures and the families they are raised in.

**Theories of Ageing**

As we age, psychological, economic, social and physiological challenges present themselves. Decline in cognitive and health functioning necessitates draining financial resources for accessing environments that are supportive to care. Loss of loved ones and friends, maintaining standard of life, accepting retirement and pondering about death are a few challenges which are faced by adults who are being aged (Lange, J. & Grossman2009),.

Theories can help the caregivers and the clinicians in navigating the changes old people experience. The choices and perceptions of older adults about the needs of their health care are influenced by spiritual, cultural, socioeconomic, environmental, regional and educational factors and status of their health.

**Psychological Theories of Ageing**

These theories focus on changes in behavior, personality and attitude as we age.

Theories	Description
<b>Human Needs Theory</b>	<ul style="list-style-type: none"> <li>• Developed by Maslow in 1943</li> <li>• Human behavior is motivated by hierarchy of needs namely, psychology, safety and security, love and belonging, self-esteem and self-actualization</li> <li>• Feelings of depression and failure set in when growth is faltered and perception towards life becomes meaningless</li> </ul>
<b>Theory of Individualism</b>	<ul style="list-style-type: none"> <li>• Theory propounded by Carl Jung</li> </ul>

	<ul style="list-style-type: none"> <li>• Personality is made up of ego and unconsciousness, both collective and personal, which sees life from an external and personal perspective.</li> <li>• Elderlies search for the meaning of life and adapt to social and functional losses.</li> </ul>
<b>Stages of Personality Development Theory</b>	<ul style="list-style-type: none"> <li>• Proposed by Erik Erikson</li> <li>• There are eight sequential stages in which personality develops.</li> <li>• In the last stage of ego integrity vs despair people evaluate their experiences and search for their life's meaning. If they are satisfied by the evaluation, they live a satisfied life whereas dissatisfaction leads to despair.</li> <li>• Additional challenges faced by elderlies include mental and physical decline, detachment from life, accepting care by others, etc.</li> </ul>
<b>Life-Course (Life Span Development) Theory</b>	<ul style="list-style-type: none"> <li>• Stages of life are predictable and are structured as per the relationships, roles, goals, values and development.</li> <li>• Individuals adapt to the changes in relationships and roles. Norms of age group and characteristics are an integral part of the life span.</li> </ul>
<b>Selective Optimization with Compensation Theory</b>	<ul style="list-style-type: none"> <li>• Individuals cope with losses of ageing through compensation, optimization and selection processes.</li> <li>• Mortality, morbidity and quality of life are critical life points.</li> <li>• This theory is ideally a coping process which is positive in nature and is concerned with facilitating ageing successfully.</li> </ul>

### Sociological Theories of Ageing

As per sociological theories, ability of older adults to adapt is impacted by changing roles, generation cohorts, status and relationships.

Theories	Description
<b>Activity Theory</b>	In order to satisfy life in old age, it is necessary to remain involved and occupied.
<b>Disengagement Theory</b>	Slow detachment from relationships and society helps in preserving social equilibrium and encouraging internal reflection.
<b>Subculture theory</b>	Segregation from society is preferred by old people in order to share societal negativity towards the aged and the status loss experienced by them leading to the concept of ageing subculture. Major determinants of social status are mobility and health.
<b>Continuity Theory</b>	Life satisfaction and roles are influenced by personality which stays consistent all through life. Coping patterns adapted by them in the past return with elderlies trying to adjust to social, financial and physical decline. Major tasks in this period of life exploring post retirement roles, finding a compatible companion with their own limitations, and identifying with their own age group.
<b>Age Stratification Theory</b>	There is age stratification in society as per the age group that are on the basis of roles, status, acquiring resources and deference. Cohorts of age are influenced by the similarity of experiences and historical contexts, expectations, attitudes and beliefs on the transitions of life-course.

<b>Person-Environment-Fit Theory</b>	Ego strength, health, mobility, environment, sensory perception and cognition affect the function. A person's ability to adapt to the demands of the environment changes their competency.
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### Biological theories of Ageing

Biological theories are generally classified into stochastic and non-stochastic theories. Random events which cause cellular damage as the organism ages are covered under stochastic theories. Events that are programmed genetically causing damage to the cells for accelerating ageing are covered under non stochastic theories.

Theories	Description
<b>Stochastic Theories</b>	
<b>Free Radical Theory</b>	Membranes, proteins and nucleic acids are destroyed by free radicals causing aging and cellular injury
<b>Wear and Tear Theory</b>	With ageing cells become unable to function and they wear out
<b>Nonstochastic Theories</b>	
<b>Programmed Theory</b>	Cells continue to divide until they become unable to further divide which triggers death of the cell
<b>Biological Clock Theory</b>	Ageing code is genetically programmed in the cells

### Problems of Elderly

The elderly face various problems in general. The ability of human organs to adapt to changes compensate for various physical impairments among aged people. Susceptibility to significant diseases like cancer and heredity influence the span of life in an individual. The traditional system is also gradually changing with time as women who used to take care of the aged members of the family are now engaged in economic activities outside the house. Older people are increasingly feeling that they are being perceived as a burden by their children.

Number of women is more than men in the age group of older people. Osteoporosis and depression are the most frequent issues witnessed among elderly people. Male elderlies have these common problems of prostate enlargement, erectile dysfunction and hypogonadism whereas females face lung and breast cancer, urinary incontinence and post-menopausal disturbances. Common concerns in both female and male elderlies are cognitive dysfunction, falls and malnutrition. Both women and men suffer from similar problems but generally the frequency with which they are affected and the speed with which these diseases convert into death distinguishes the health problems between the two genders. Old age impacts differently on women than their male counterparts due to differences in their roles and status in society. Proportions of 60 above widows are significantly higher than the widowers in the same age group. Sexuality is not considered a health condition particularly in older women. Sexual functions should be considered important for overall well-being particularly among older women. Positive physical and mental health is associated with involvement and participation in religious activities.

### **Health Problems**

Health is one of the major problems associated with ageing as this period in life is filled with serious and frequent illnesses, physical handicaps and mental disturbances.

- Old age people suffer from illnesses which are chronic in nature which usually becomes lethal for them. Ailments which are frequently seen among old people are diabetes, cancer, cardiovascular diseases, hypertension, kidney diseases, arthritis, Parkinson's disease, dementia, etc.
- Multiple conditions affect elderlies which include speech deterioration, hearing impairment and visual defects which have the potential to lead towards social isolation.
- The health status of the elderly people is improving with advancement in medical sciences. Older generations have the potential to contribute to the economy if they'd be encouraged.

### **Economic Problems**

Since old people retire from jobs they experience vulnerability feelings with regard to economic resources.

- Old age is accompanied by physical inability to work, retirement from job, and thereby inability to stand on own feet. This affects the elderlies who are left with little to no income for sustaining economically.
- As 90% of old age people are engaged in the unorganized sector, they are not entitled to gratuity, pension, medical schemes or other social security schemes leaving them economically vulnerable and insecure.
- Apart from that, the children or relatives are also either unable or unwilling to take proper care of elderlies which aggravates their economic insecurity. Poor people already struggle to meet their ends; it becomes really difficult for them to economically support the old age population.
- Old people who can work must be encouraged to engage in wage employment for economic security. Those who can't must be linked with various social welfare schemes of the government.
- The potential of older people should be recognized by the government and the society and it should be channeled productively using their time. This would support the elderlies in earning a living and also help the society with their extensive experiences.

### **Social Problems**

In old age, people are unable to manage things by themselves which lowers their self-esteem. Other family members are so busy in their own lives that they do not have time for old generations.

- Self-esteem further goes down when the elder people see themselves unable to do certain things which they could easily do when they were young.
- When one becomes old, the label on them changes from being useful members of the society to totally dependent individuals. In old age, people feel neglected from society and especially their dear ones due to the mentality that they are burnt out or spent force.
- Due to decline in social, economic and health status, many elderlies fear themselves disappearing in the crowd. Few of the fears are also related to the loss of their spouse and their own death.
- Old people who have irrational fear are needed to be counseled and treated whereas those with rational and real fear need to be offered preventive measures. Again, their low self-esteem also reduces their chances of staying positive.

- Older generations feel isolated in this busy world from psychological and physical fronts and fear being cut off from the society. Isolation is physical because in most of the cases their children migrated to another city or country to earn a living.
- Psychological isolation happens because younger generations do not spend time with the elderlies. This type of isolation can also be fatal to the already deteriorating health condition of the elderlies as they feel undesired.

### **Adjustment Problems**

- Patience, hard work and kindness are required while caring for elderly persons. But caring is only focused on physical needs of the older persons whereas there are more dimensions to it.
- While migrating to urban areas, children prefer to leave their parents at the native place due to high costs of healthcare and housing.
- National Policy on Older Persons (NPOP) mentions, “Due to shortage of space in dwellings in urban areas and high rents, migrants prefer to leave their parents in their native place. Changing roles and expectations of women, their concepts of privacy and space, desire not to be encumbered by caring responsibilities of old people for long periods, career ambitions, and employment outside the home implies considerably reduced time for caregiving.” (Government of India, 1999)
- Elderlies become frustrated when they can't take care of themselves which can often be translated into anger towards the person taking care of them. It is very important at this point to comfort them by telling that everyone around them loves them.

### **Elder Abuse**

- Elderlies are exposed to psychological, physical and verbal abuse. Many times it is by their own family members which hurt them psychologically leaving them traumatized.
- Children often exercise authority and power over their older parents because of their dependency. Elderlies are subjected to physical abuse by the acts of violence such as hitting, striking with an object, pushing, beating, pinching, kicking and burning.
- By inflicting pain, anguish and distress, psychological abuse is exercised on old people. It also includes insults, intimidation, assaults, harassment and humiliation. Old people are sometimes also subject to sexual abuse which may include rape, coerced nudity and unwanted touching.

### **Government Programs and Schemes**

Nodal ministry for the senior citizens is the Ministry of Social Justice and Empowerment which focuses on development of programs and policies for elderlies by collaborating with State Governments, Civil Society and Non-Governmental Organizations. The aim of the programs for elderlies is their welfare and support, especially indigenous elderlies, by providing them day care centres, medicare units, old age homes, etc. There are constitutional provisions, various legislations, national policies and schemes by other ministries for the old support and welfare of old age people.

- **Article 41** under Directive Principles of State Policy (DPSP) directs the state to make effective provisions for securing the right to work, to education and to public assistance in cases of unemployment, old age, sickness and disablement.
- **Article 47** is the one under which the state shall raise the level of nutrition and standard of living of people and improvement of public health as among its primary duties.

- For the welfare and need based maintenance of senior citizens and parents, the **Maintenance and Welfare of Parents and Citizens Act** was passed in December 2007. Facilities of health care have improved over years due to which there is an increase in the proportion of senior citizens in the total population of the country. The legislation ensures that the elderlies not only live a long life but enjoy a secure, productive and dignified life.
- **National Policy on Older Persons (NPOP)** was announced by the government of India in 1999 for asserting its commitment in ensuring holistic welfare and security of old people. The policy put the concerns of elderlies on the priority of the National Agenda. The NPOP safeguards legal, health, social, psychological and financial security envisaging fruitful partnership by generating opportunities for their employment and gainful engagement. It puts the significance on empowering communities and individuals for meeting the challenges adequately in the ageing process and also addresses the special needs of the elderlies.
- On 15th August, 1995, the **National Social Assistance Programme (NSAP)** came into effect which provides social assistance to the poor households representing a remarkable step towards following Article 41 and 42 of the Directive Principles of the Indian Constitution.
- **The National Old Age Pension Scheme (NOAPS)** considers old age persons/destitute who have very little to no means of subsistence to suffice themselves. The applicant must be of the age 65 years or above to be eligible for this assistance. Current coverage of the scheme is 50% of the elders from BPL category. In the scheme, Rs.200/- is contributed by the Central Government per month for each beneficiary whereas the State Governments are recommended to contribute the same amount or more.
- Government of India launched **Senior Citizens Saving Scheme (SCSS)** which is offered to Indian citizens who are more than 60 years of age. They are entitled to deposit an amount of minimum Rs.1000/- to maximum Rs.15,00,000/- which will mature in 5 years and is extendable for additional 3 years. This scheme can be availed through any bank (public or private) or through Indian Post Office. The scheme is offering an interest rate of 7.4% for July to August 2020 which is reviewed every quarter by the government. The accrued interest is compounded and credited quarterly. These investments are eligible for tax exemptions and allow withdrawal of money before the maturity period with a penalty charge of 1.5% if it is before 2 years and 1% if after two years.

### **Social Work Interventions**

#### **Clinical Interventions**

Therapy is provided by social workers to elderly clients who feel lonely or are suffering from isolation, anxiety, depression or neglect. Such clients are encouraged by geriatric social workers to engage in stimulating activities by helping to arrange outings with groups. They also help elderlies by recording their 'life stories' and showing them for helping them cope with the adversity of time.

#### **Service Interventions**

Social workers bridge a link between their clients and public/private programs especially outlined for ageing people. Help is provided by the social workers to the clients for applying in appropriate services and also sort out issues arising in the delivery of such services.

#### **Advocacy**

Geriatric social workers support ageing people against the violence and abuse they face by becoming a frontline defense. They help their clients in raising their voices at appropriate platforms using correct channels.

Direct assistance services are also offered by the social workers to the families of old aged people like useful technology suggestion, coordinating in medical care and rendering family-support services.

Counseling services for dealing with bereavement, end-of-life issues, etc. are also offered by geriatric social workers. They help the families in guiding through transition process from home to long term care, support with approaching a care planning for end-of-life (advance directives, living wills) and help in completing paperwork. The problems faced and present status of old aged people must be immediately addressed and a solution needs to be devised.

### Conclusion

Intensive research is involved in dealing with the elderly issues because there are many dimensions related to it. Interventions of non-governmental organizations, government and social scientists are required. There have been discussions related to the process of aging, problems faced by the aged and various social work and government interventions for the welfare and support of elderly people. Learning about the concepts and issues of elderlies has brought clarity on ageing, dimensions, schemes and issues.

Social work with aged people plays an important role in helping elderly population in order to lead better lives in all respects. As per the census of 2011, India has 90 million people in the older population and it has been estimated that the total density of the older population by 2050 will be around 315 million which indicates the relevance of geriatric social workers in the coming years. People in rural and urban areas nowadays are more concerned about their health in the old age and this attitude will somewhat support the efforts of government, non-government and all those people who are trying to work towards social, economic and health benefits of the elders.

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## CHAPTER 14

# ADOLESCENT DEVELOPMENT IN INDIA: CALL FOR SOCIAL WORK INTERVENTION

*Dr. Sunil Kumar Choudhary<sup>1</sup>*

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### **Abstract**

Adolescent age has significant role in development of any human being. It decides the future personality determinants of an individual. There are so many factors which influences the individual passing that era. This is the age when an individual experiences many physical, psychological and psychosocial changes. Hormonal changes, identity crisis, detachment from parents, self consciousness, acknowledging sexuality etc. are the challenges they face. In India govt. has initiated various programmes and schemes like SABLA, SAKSHAM, KISHORI SHAKTI YOJNA (KSY), MID DAY MEAL etc. to support the development of Adolescent. There is need of significant Social Work intervention in physiological, psychological, psychosocial and service delivery level support for overall development of Adolescence.

*Key words - Age, Adolescence, Government, Consequences, Challenges, Social Work, Interventions*

### **Introduction**

**T**ransitioning phase from childhood to adulthood is understood as adolescence which extends from the age of 12 years to 19 years. While moving from childhood various physical milestones are experienced by the teenagers until they reach adolescence. Sexual maturation, which is called puberty, and increased body size are the significant growth parameters which are natural during adolescence.

Adult weight and height are reached by girls and boys during adolescence. It is the time for puberty changes and growth spurts. Several inches may grow in certain months which will be followed by very slow growth and then they may have a spurt in growth again.

Both girls and boys have to go through puberty which may start by the age of 9-10 in girls and by 12-13 years in boys. The age may vary from person to person but puberty hits in girls earlier than the boys.

An independent and unique identity is desired by adolescents which is separate from their caregivers. It is not like they don't love their family but they do not wish to follow their footsteps. They like to challenge their family by disobeying their rules; criticizing their values which are old-fashioned according to the adolescents; and also discard the suggestions provided by their parents. Adolescents are more inclined towards their peers and give them more credit. They tend to exaggerate their strengths and conceal their weaknesses (Maghaddam, T. H, Bahreini. A, Abbasi, A. M, Fazli, F, Saeidi, M. 2016).

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*“Adolescents are individuals in the 10-19-year age group and ‘youth’ as the 15-24- year age group. These two overlapping age groups are combined in the group ‘young people’, covering the age range 10-24 years. Adolescence is a phase rather than a fixed time period in an individual’s life ( National Research Council. 1993).”*

### **Consequences of Adolescent**

#### **A Transitional Period**

- Passage from one step to another in life is transition rather than changes from or break with previous engagements. Status of the individual is vague during the period of transition and there seems to be a lot of confusion regarding the expected role of the individual.
- Adolescents are neither adults nor children. When adolescents behave like adults they are reprimanded for their attempts and are accused of behaving in a manner not appropriate of their age.
- If they act like children, they are reproved and asked to act their age. This ambiguity is however advantageous sometimes as this gives the adolescents to decide different patterns of attitudes, behavior and values and try different lifestyles that best meets their needs.

#### **A Period of Change**

- The amount of physical change during adolescence is parallel to the amount of changes in behavior and attitudes. If rapid physical changes are experienced then behavioral and attitudinal changes will also be rapid. With slower physical changes, behavioral and attitudinal changes are also slow.
- Heightened emotionality is experienced during adolescence whose intensity depends on the rate at which psychological and physical changes take place. It is more intense during early adolescence as rapid changes occur during that time rather than late adolescence.
- Adolescents become unsure of their capacities, interests and their own-self with rapid changes in their sexuality. They receive ambiguous treatment from their teachers and parents which intensify their feelings of uncertainty.
- With changes in behavior and interests, their values also change. Things which seemed important during childhood become less important when they are nearing adulthood. Quality is preferred over quantity.
- Some adolescents demand and want independence but often fear the responsibilities that come along which makes them introspect their ability to manage these responsibilities making them ambivalent towards changes.

#### **A Problem Age**

Some adolescents do not have the capacity to cope with their problems on their own because many of their issues were solved and met throughout childhood by their teachers and parents. Due to the want of feeling independence, they demand freedom and assure that they have the capacity to deal with their problems by turning down the help provided by teachers and parents.

#### **A time for Identity Search**

- Teenagers begin to assert and explore themselves during adolescence. They engage themselves in the process of exploring where they square in with their peers as well as society at large during the developmental period.

- They seek to clarify the identity of who they are and what role they play in the society. Adolescents have an unsteady sense of their own-self and they often try to don new labels while associating with their friends. It is struggling to define sexual identity by the adolescents during their teenage years.
- By the time the adolescents reach the age of 19 to 21, the identity issues are stabilized as per the “Facts for Families” published by the American Academy of Child and Adolescent.

### **Peer Relationships**

- Peers become more important than family hence relationship with friends is prioritized over family. Adolescents associate more value to the perceptions of their friends rather than the family despite the importance of family interactions in the development of the teenagers.
- Teenagers are influenced by the behaviors and beliefs of their peers. Restricted life experiences of adolescents combined with under-developed skills of decision-making make the teenagers usually vulnerable to adverse peer pressure.

### **A Threshold of Adulthood**

With reaching the age of legal maturity, the adolescents become anxious to showcase the impression that they have grown up to be near-adults. They begin acting and dressing like adults and discover something new every time. They start concentrating on adult behaviors associated with the status building like drinking, smoking, sex and drugs. They are under the impression that this would help them achieve the image they want (Pruitt, D. 2000).

### **Testing Boundaries and Independence**

Boundaries and rules of teachers and parents are often tested by adolescents. This behavior seems rebellious to the parents which is actually driven by their needs to assert autonomy, earn independence and experience new pursuits, as per the American Psychological Association. Although, testing boundaries by teenagers can be beneficial but requirements of boundaries and rules are necessary to achieve their full potential and steer clear of negative influences.

### **Self-centered Attitudes**

Looking at different circumstances from the perspective of other people is often difficult for the teenagers because their brain structures are still developing. This makes the adolescents look focused on themselves and self-centered without considering the needs of others. By the time the age group of adolescence comes to an end, this apparent behavior would seem normal as it would be resolved by then. Although if empathy seems to be completely lost it might be a symptom of an underlying mental health issue for which they must be consulted with a mental health worker.

### **Challenges faced by Adolescents**

Adolescence is a phase during which many challenges are experienced by the teenagers as well as their caregivers. During this time, the adolescents undergo a variety of changes emotionally, physically and chemically. Dramatic changes in the lives of adolescents are experienced which include changes in the thought process, increase in hormone levels and changes in their social lives. Since these changes have to be dealt by the teenagers at the same time, it becomes rather challenging to cope up with everything.

Caregivers should have a supportive contribution during this phase of life of the adolescents as they have the necessary maturity, experience and resources for making this transition as smooth as possible.

### **Coping with the Loss of Normalcy**

- Some adolescents realize that they have significant difficulties in maintaining social relationships as compared to their peers. It is necessary to understand the behavior, feelings and thoughts of such adolescents and help them out by being there for them.
- Realizing this becomes painful not only for the adolescent but for the caregivers too. The adolescents should be guided to face the problem and handle it fairly instead of denying its existence.
- Adolescents develop frustration and anger and also do not want intrusion of parents in their lives. It is important to listen to the problems being shared by the adolescents and see it from their perspective which in turn will improve their confidence and develop trust with parents.

### **Acknowledging Sexuality**

- Adolescent period is a time for maturation and developing socially, sexually and physiologically. Development and growth are continuous processes which contribute to transforming a person every moment.
- Sexuality development begins right from the womb and is evolved throughout the lifetime course until death. This age group is an essential transition phase during which sexuality development takes place.
- Puberty is hit during adolescent period only which is considered a major landmark for sexuality development.
- The need for love making and intimacy with opposite sex increases during adolescence and they explore multiple ways of exploring the intimacy and their love.
- In Indian society, talking about sex or private parts of the body are a taboo which puts the teenagers under the risk of learning about sexuality from unauthentic and unsafe sources in inappropriate manners like porn movies, internet and hearsays from friends which might lead to unethical behaviors and contracting sexually transmitted diseases.
- Sex education is neither part of school curriculum nor is talked about at home. The caregivers do not talk about sex with a fear of directing their teenage children towards unethical practices which include girls getting pregnant, boys committing rape or doing sex with their girlfriends, etc.
- Sexuality is associated with respect especially of girls, hence sexual relationships are disgraced until the adolescents are young enough to marry.

### **Change in the Point of Views**

- Adolescents have a distinct sexual orientation during this time and are involved in following serious relationships. They feel the capacity of loving others sensually and tenderly.
- Personal dignity and self-esteem are imperative to them and desire to be treated and respected as adults. Insights can be offered by them on multiple things and they are capable of setting goals and following them for themselves.
- Self-regulation is learnt by this time and they accept cultural traditions and social institutions more easily.
- There can be emotional and mental problems involved which are mostly treatable by garnering help from a professional expert.

### **High-risk Behaviors**

- Unique transition is experienced from youth to adulthood during late adolescence. This group of youngsters is considered healthy but they are susceptible to developing various medical problems during this period.
- Eating disorders are usually found among this age group of adolescents. They are too much concerned about their appearance, abstain from becoming obese hence starve to maintain the lean figure which leads to development of eating disorders.
- High-risk behaviors are developed during this age as they experiment with alcohol, drugs, smoking and likes. They enjoy taking risks, defying norms and try to convince elders as well as peers that they have grown up.

### **Needs of Adolescents**

Adolescence, with its adjustment issues and characteristic needs, is a critical time in an individual's life. Certain needs are possessed by every adolescent and satisfaction of those needs is very important for their continued development in physical as well as other aspects. A need becomes a tension affecting the health of the individuals if not satisfied.

With the satisfaction of need, tension is relieved and the person experiences satisfaction. Socio-psychological and Physiological needs are the two broad classifications of the needs of adolescents.

- **Physiological Needs:**

Primary needs like food, air, clothing and water are the physiological needs. These basic needs are rarely achieved by many adolescents in India who are living under poverty while adolescents in rich families enjoy these in abundance as they amount to multiple political and socio-economic causes.

- **Socio-Psychological needs:**

Needs which are influenced by the socio-cultural environment of the individuals are known as secondary needs. These needs are acquired by social learning whose satisfaction is very important for the individual's psychological well-being. Following are the necessary socio-psychological needs -

#### **Need for security**

Apart from physical security, adolescents require social, economic and emotional security as well. Maladjustment sets in if a person develops a feeling of insecurity. The desire of humans to be gregarious gave rise to the requirement of social security.

#### **Need for Love**

The most fundamental psychological need among adolescents is love or affection. They have a deep urge to love and be loved. Those who are deprived of affection during these years face behavioral issues and become skeptical of their own existence. Love is necessary to strengthen the feeling of security among the individuals.

#### **Need for approval**

Adolescents face the craving to be included and accepted or in other words they have a fear of missing out. They are attracted to the opposite sex and hence desire to become centre of attraction especially among those they like or have a crush on. They seek recognition from the peers of their abilities, capacities and intelligence (The Lancet Series on Adolescent Health, 2012).

### **Need for freedom and independence**

Friends become more important than the family for the adolescents. They spend more time with their friends while family seems to be an enemy during these years. They believe they are best understood by their friends and want freedom for the control of family. They are full of mixed emotions and ideas that they need to express and loathe the restrictions imposed particularly during these years.

### **Need for self-expression and achievement**

Inherent desire to express their potential is high among all adolescents. They possess multiple potential such as poet, painter, musician, etc. which they wish to express with the help of adequate opportunities. Satisfaction is felt by the adolescents when they succeed whereas failure would make them disappointed and depressed.

### **Government Program and Schemes for Adolescent Development in India**

#### **Sabla**

Sabla is a program sponsored centrally under the Ministry of Women and Child Development by the Government of India which was initiated as the Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG) on April 1, 2011.

- The main objectives of the scheme are enabling the adolescent girls for empowerment and self-development; improving their health and nutrition status; promoting awareness regarding nutrition, SRHR, health, hygiene, life skills and child and family care home-based skills; integrating for vocational skills with the National Skill Development Program (NSDP); mainstreaming adolescents girls who are out of school into formal or non-formal education; providing information and linking the beneficiaries with PHCs, CHCs, Police Station, Bank, Post Office, etc.

#### **Saksham**

- Saksham or Rajiv Gandhi Scheme for Empowerment of Adolescent Boys was launched to show support to adolescent boys in the age group of 10 to 18 years of age. The main aim of the scheme is to develop their self-motivation, self-confidence, independence and gender sensitivity for growing up as independent human beings.
- Through this scheme adolescent boys are helped in utilizing the available resources in a positive sense and grow as a sound individual. It also motivates the boys for building a better future and is known to nurture beliefs and values among them.

#### **Kishori Shakti Yojna (KSY)**

- Kishori Shakti Yojana is launched under the ambit of ICDS which aims at the holistic development and empowerment of adolescent girls. With the help of the scheme their self-perception is improved and opportunities are created for helping them realize their complete potential using Balika Mandals.
- The primary aim of the scheme is to break the intergenerational cycle of gender and nutritional disadvantage and improve self-development by providing a supportive environment.
- Non-formal education is offered to the adolescent girls under this scheme which is carried out under ICDS of the Ministry of Women and Child Development. It focuses on sex education, family welfare and vocational training. Anganwadi Centres provide basic supplements to the adolescent girls like deworming and IFA tablets.

### **Scheme for Promotion of Menstrual Hygiene among Adolescent Girls (10-19 years) in India**

- Government of India launched the scheme for improving the menstrual hygiene among rural adolescent girls of the age 10 to 19 years across 20 states of India. It is managed through the National Rural Health Mission (NRHM) with the main objective of spreading adequate information and knowledge on sanitary napkins' usage and menstrual hygiene.
- The scheme covers adolescent girls in the category of APL and BPL. Under the scheme, a packet of 6 sanitary napkins are provided to girls from BPL categories at a cost of just Re. 1 while APL category girls are charged Rs. 5 for the same.

### **Weekly Iron and Folic Acid Supplementation (WIFS)**

- The Weekly Iron and Folic Acid Supplementation (WIFS) Program was launched by the Ministry of Health and Family Welfare for meeting the challenge of high incidence and prevalence of anemia amongst adolescent boys and girls.
- For managing the prevailing situations of anemia amongst adolescent boys and girls, WIFS was launched as an evidence based program which is intended to run through weekly supplementation of IFA tablets and helminthic control biannually.
- The long term aim of the program is to break down the intergenerational cycle of anemia in both urban and rural areas of India covering 19 of its states. It is run through schools, anganwadi centres and health centres across these states.

### **Mid-Day Meal Program (MDM)**

Under this program, primary and upper primary class students are provided with hot-cooked meals at the school during lunch time for improving the status of nutrition among them and in turn encourage the children from disadvantaged communities to regularly attend the school which helps in improving the enrolment, attendance and retention rates in schools. In 2018-19, the MDM program served around 9.17 crore children as per the data of the Government of India which covered 11.35 lakh schools (Upadhyay, A. 2020).

### **School Health Program**

- For addressing the mental and physical health needs of children in school age in order to enhance social equity and improve educational outcomes, this program aims at focusing on an efficient integration through nutrition, hygiene, sanitation, gender, safe drinking water, etc.
- It is a centrally sponsored scheme and a joint initiative of the Ministry of Human Resource & Development and the Ministry of Health and Family Welfare.
- It is incorporated under the Ayushman Bharat Programme as a component of Health and Wellness for strengthening the promotion and preventive aspects through promotion of health activities.
- These activities combine disease prevention, health education, improve accessibility to systematic and integrated health services at school level, and launching operational guidelines for health promotion.
- Social morbidities such as violence, emotional and psychological disorders, sexual behaviors, substance abuse and injuries are more focused under this program.

### **Rashtriya Bal Swasthya Karyakram (RBSK)**

- The initiative of Rashtriya Bal Swasthya Karyakram (RBSK) aims at early identification and intervention in the first 18 years of life for covering 4 'Ds' namely Diseases, Deficiencies, Developmental delays (including disabilities) and Defects at birth.
- As per the scheme, the District Intervention Centre (DIEC) manages children in the age group of 0-6 years while public health facilities cater to the conditions of older age group children.
- Medical officers, ANMs and Staff Nurses are given the charge of primary screening at all delivery points.
- Screening of newborns after 48 hours to 6 weeks is to be done by ASHAs at home under HBNC package. Children older than weeks till 6 years will be screened at anganwadi centres while 6 to 18 yearolds will be screened at school. After screening and referral of the child from these identification points, zero cost treatment and intervention will be delivered to the family as per this scheme.

### **Social Work Intervention**

For assisting the groups, families and individuals with their issues and needs, various interventions are initiated by the social workers. These interventions are provided with the aim of aiding the clients in alleviating their problems which are impeding the well-being of the individuals. Potentially helpful interventions are used by social workers for the development of the beneficiaries involved. Intervention type of social work is decided as per the structure of government regulatory, available resources and type of client (Rajendran, S.K. and Karibeeran, S. 2015).

### **Strengthening Families and Neighborhoods**

Attention to neighborhoods and families is required for assisting adolescents as they experience these settings on a regular basis. Residents of the community should be viewed as important resources contributing substantially to the process of change. Supporting parents of adolescents is very important, failing which their capacities diminish to support their own teenagers. With the help of family support programs, social workers can intervene in educating the families on effective caregiving practices when the behavior and attitudes of adolescents is volatile in nature. Apart from strengthening particular families, programs related to strengthening and rebuilding neighborhoods are also undertaken for developing a healthy and growing environment for the adolescents.

### **Improving Institutional Services**

This is concerned with effective initiatives in areas of education, employment training and health which seek to restore the current practices of institutions with better alternatives suited to the developmental wants of adolescents. The health services which are existing do not address the specific issues of adolescents. Friendly services are not being rendered to the adolescents rather they feel criticized and judged by the adults. Health centres near the schools offer a wide range of benefits to the adolescents. They offer a confidential setting and are readily accessible in a familiar environment.

The civil society organizations working directly at the grassroots level intervene by opening community-based centres to provide access to various educational, vocational training and health based services to the adolescents. The greatest strength of these centres is their accessibility to all the eligible beneficiaries. The NGOs also work on building the capacities of government functionaries associated with the important institutions to cater to the demands and needs of the adolescents. Social workers ensure that

essential educational, employment and health services are accessible, equitable, effective and appropriate for all adolescence.

### **Developing emotional strengths and life skills**

For confronting the feelings of emotional pain and hopelessness, special services are needed by adolescents from high-risk settings for their appropriate positive development. Some community initiatives incorporate steps to promote integrated peer group interactions for enabling cross-learning among each other. Other initiatives are helping adolescents by providing opportunities to develop and practice decision-making, life and social skills necessary for succeeding in high-risk settings.

### **Sexual and Reproductive Health and Rights (SRHR)**

Social workers ensure promotion and understanding of sexual and reproductive health and rights which not only improve the status of reproductive health but also advocate for social justice responding to globalized realities. It includes rights of both, women and men, to have timely and correct information as well as access to contraceptive methods and appropriate postpartum, delivery and prenatal healthcare services.

SRHR especially impacts the lives of adolescent girls as they usually are not given the freedom to decide the number and interval of children, freedom to integrity and violence, freedom of choice of engaging in sexual activity, etc. The stigma associated with sexuality and sex does not let these issues enter the arena of public discourse.

For promoting the SRHR, social workers ensure that the services are improved and become adolescent friendly; impart or ensure sex education is provided to the adolescents in schools or during community sessions; build capacities of government functionaries and other civil society organizations; and engage stakeholders for promoting SRHR.

### **Menstrual Hygiene and Management**

Awareness on hygiene and sanitation are created by the social workers in all private and government schools for developing the knowledge among adolescents about taking measures during menstruation. Myths are busted and menstrual hygiene practices are improved with the help of awareness programs and initiating talk around the issue of menstruation.

### **Conclusion**

Transitioning phase from childhood to adulthood is called adolescence. Dramatic changes are experienced by the individuals during this time period. Individual adolescents as well as their parents could be frustrated during the period of adolescence as it tends to be a phase of rebellion against the authority imposed by parents in order to search for personal identity. Adolescent minds and bodies go through rapid changes which sometimes act as a threat to their well-being. Smooth transition can be ensured by understanding the influences of the environment in cognitive, psychosocial and physical development on both parents and the adolescents.

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# CHAPTER 15

## A REVIEW OF FLY ASH COMPOSITES

*Dr. B. Babu<sup>1</sup>, Dr. R. S. Jayaram<sup>2</sup>*

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### Abstract

Several studies focused on determining the mechanical characteristics of Fly ash composites have been conducted in the last decade. Because of their superior tensile and compressive capabilities, as well as impact and hardness response, these composites have gained interest, particularly in the form of reinforcements. Fabrication of these composites has been described using a variety of techniques, including in-situ deposition, hand-up lay, and compo-casting. However, no systematic structure-property association has been found in the context of these composites to date. The purpose of this study is to highlight the current level of research in the field of Fly ash composites from two perspectives: fabrication technique and mechanical properties of manufactured composites. Furthermore, the author has briefly emphasised the importance of creating systematic structure-property correlation in these materials.

*Keywords: Stir casting, hand lay-up, mechanical properties, correlated micro structural characterization, fly ash composites*

### Introduction

Composites are used in a variety of engineering applications because they improve physical and chemical qualities by combining two or more materials, one of which functions as a matrix and the other as a reinforcement [1]. Polymer [2], ceramic [3], metals [4], and non-metals [1] are only a few examples of matrices that have been described. Silicon carbide (SiC), boron (B), alumina (Al<sub>2</sub>O<sub>3</sub>), fibres, particles, graphite, rice husk, and fly ash are examples of common reinforcements used in composites [5]. Specific strength, specific modulus, damping capacity, and wear resistance are all quite high in composites [5]–[8]. According to Zhang et al. [9], adding high strength and high modulus particles as Al<sub>2</sub>O<sub>3</sub>, TiC, TiB<sub>2</sub>, SiC, and others as reinforcements can improve the mechanical properties of metal matrix composites (MMCs). There are two types of fly ash particles: cenosphere-hollow particles (density less than 1 g/cc) and precipitator-spherical particles (density 2–2.5 g/cc). The former is utilised to make ultra-light composites because of their low density compared to metal matrix density, whilst the latter is employed to improve attributes such as density, wear resistance, stiffness, and strength [10], [11]. Because of its low cost and low density, fly ash is a common industrial byproduct from thermal power plants and is abundant in nature [6], [12],–[14]. Fly ash may be employed as a potential reinforcement for the manufacture of low-cost composites with better physical and mechanical properties for usage in a variety of industrial applications, according to Prabu et al [4]. Correlative microscopy, on the other hand, has emerged as a potent

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technique for the structural and chemical characterization of a variety of micro structural characteristics over a wide range of length scales [15], [16]. To put it another way, the aforementioned method can deliver both structural and chemical information from the same micro structure region [17]. The current review focuses on some of the most frequent processes for producing Fly ash composites. This was followed by a description of the mechanical properties of these composites (compressive, tensile, and hardness). From the author's perspective, the importance of correlative micro structural characterisation in terms of developing a systematic structure-property correlation in these materials has also been explored.

### **Fly ash composites fabrication**

The manufacturing of Fly ash composites has been documented using a variety of processes. Stir casting and hand lay-up techniques are prominent examples.

#### **Stir casting**

Mechanical stirring is used to combine the dispersed phase with the molten metal matrix in this method [18]. Large-scale composites can be produced in a cost-effective manner [18]. The major process characteristics throughout this process include reinforcement material distribution, wettability, porosity of cast composites, and chemical reaction between matrix and reinforcement material [8]. Kulkarni et al. [19] reported the fabrication of MMC (by stir casting) utilising Al356 alloy as a matrix and reinforcement of size 100 m. In addition, MMC has been claimed to be manufactured using a combination of (2, 4, 6, and 8) wt% fly ash, (2 and 6) wt% E glass, and Al6061 composite. The stir casting technique was used to make three types of Al6061 composites with fly ash as reinforcement with reinforcement weight fractions of 10, 15, and 20% and particle sizes of 4–25, 45–50, and 78–100 m. Hexachloroethane tablets, Al6061, and heat-treated fly ash were used to make Al matrix composites in rod and slab form [18].

#### **Hand lay-up**

This method includes mixing the resin and reinforcement by hand on the surface of a mould, then curing the resultant laminate without any treatment [7]. The fundamental benefit of this technology is that it can easily create huge and complex parts [8]. This technology, for example, can produce high-strength turbine blades at a minimal cost. Glass fibre reinforced fly ash composites with (0, 5, 10, and 15 wt. percent) reinforcements have been described using this process [6]. In addition, Al<sub>2</sub>O<sub>3</sub>, magnesium hydroxide, and hematite powder have been used to fabricate E glass/epoxy-based composite slabs [19]. Furthermore, different fly ash concentrations (0, 10, and 15 vol. percent) were employed to determine the epoxy, filler materials, and fibre fraction [20].

#### **Density**

The density of fly ash composites has been reported to be lower than that of Al<sub>2</sub>O<sub>3</sub> reinforcement [19]. The density of fly ash-based composites reduces as the amount of fly ash increases. For Al<sub>2</sub>O<sub>3</sub> reinforced composites, on the other hand, density rises as Al<sub>2</sub>O<sub>3</sub> content rises [19]. Using the Archimedes principle, Boopathi et al. [21] investigated the densities of Al<sub>2</sub>O<sub>3</sub> composites enhanced with SiC and fly ash particles. The density of Al-SiC, Al-fly ash, and Al-SiC-fly ash composites is claimed to decrease linearly as the fly ash and SiC concentration increases. This could be due to the reduced density of fly ash and SiC particles compared to Al (matrix) [21].

## **Mechanical properties**

### *Tensile properties*

The addition of fly ash content and E-glass fibre to Al6061 has been found to boost the tensile strength of fly ash composites [18]. The presence of high-strength fly ash particles increases tensile strength when a tensile load is applied [22]. The rise in the The addition of ash to the Al7075 alloy increases its tensile strength up to a certain point, after which it declines [23]. The tensile strength of fly ash and alumina reinforced LM25 MMC has also been found to increase with increasing fly ash concentration [24]. The effect of fly ash reinforcement on the tensile strength of polyphenylene oxide composites has been studied experimentally [25]. Tensile strength (ultimate tensile strength (UTS)) is independent of fly ash content for larger particle sizes, however UTS decreases due to agglomeration for high fly-ash concentration for smaller particle sizes [25].

### *Compressive properties*

The compressive strength of all forms of fly ash reinforced composites increases as the fly ash content rises. Compressive strength of composites reinforced with Al<sub>2</sub>O<sub>3</sub> is higher than that of composites reinforced with fly ash [19]. Furthermore, using E-glass fibre and fly ash to reinforce these composites increases their density, which improves their compressive strength [19]. In the case of Al6061, reinforcing using fly ash particles has been shown to boost the composite's compressive strength [8]. With increasing fly ash particle size, the composite's compressive strength has also been reported to decrease. The compressive strength of concrete composites reinforced with fly ash and nano-SiO<sub>2</sub> is found to be higher than that of concrete composites lacking steel fibre reinforcement [9].

### *Hardness*

With increasing fly ash content in Al6061 composites, the character of the material changes from ductile to brittle [7]. The toughness of these composites increases as a result [23], [25]. The addition of fly ash to polymers increases their resistance to plastic deformation. The hardness value rises as a result of this. When compared to other fly ash filler sizes, the 300-nm size fly ash filler in polymer matrix composites has a higher hardness [26]. A larger phase contact between the filler and matrix phases has been attributed to this [27]. The hardness of these composites has also been shown to rise when the silicon carbide (SiC) particle size increases (as reinforcement). Maximum hardness is achieved with the combination of Al/(10% SiC+10% fly ash) [28].

### *Wear*

Sharma et al. [29] found that the wear resistance of fabricated composites increases as the fly ash content increases in Al MMCs reinforced with fly ash. Furthermore, when compared to composites with low fly ash concentration, composites with high fly ash content have been observed to have 13.6 percent reduced wear. The average coefficient of friction for medium fly ash content (4%), was reported to be the lowest (0.12), while the average coefficient of friction for high fly ash content (6%), was reported to be the highest (0.161). Based on this research, it was determined that the amount of fly ash in the Al matrix should not exceed 4% in order to avoid a high coefficient of friction. Dry sliding wear of fly ash particle reinforced A356 Al composites has been examined by Sudarshan and Surappa [11], [14], and Rohatgi et al. [8]. It has been claimed that incorporating 6% fly ash particles into A356 Al alloy reduces dry slide wear rates at low loads (between 10 and 20 N) [11]. 12 percent fly ash was used to reinforce the structure. When compared to non-reinforced alloys between 20 and 80 N, composites reinforced with 12 vol. percent fly ash showed lower wear rates [8], [11]. Wear rate was found to decrease with particle size in composites containing 12

vol.% fly ash [11]. With increasing fly ash concentration from 6 to 12 vol. percent, the magnitude of friction co-efficient increased (from 0.49 to 0.58) [8], [14].

Adhesive wear was shown to be the most common in non-reinforced alloys, while abrasive wear was seen in composites [8], [11]. Furthermore, subsurface delamination has been identified as the major process for both alloys and composites at greater loads [8]. Desai et al. [5] found that high load causes high pressure at the point of contact, which leads to a strong rubbing action. As a result, increasing the applied load causes the wear rate to rise. It's worth noting that adhesion-based wear mechanisms are more common in base metals, whereas abrasion with micro-cutting and oxide production are more common in Al-based fly ash composites.

### **Future perspectives**

The current level of fly ash composites research is focused on fabrication techniques and mechanical properties of these materials. A systematic structure-property correlation investigation is, however, lacking. This is due to the fact that, to yet, no research in the field of these composites has focused on (i) understanding the influence of process parameters on micro structure evolution, and (ii) understanding micro-structural flaws and their impact on the mechanical characteristics of these materials. This may be due to the fact that most research groups working on fly ash composites are not primarily focused on metallurgical research at the moment. Micro-structural flaws, which arise during manufacture, are very sensitive to the mechanical properties of composites [30]. Furthermore, these properties are anisotropic in these composites' longitudinal and transverse sections [31]. Correlative microscopy has evolved as a powerful method for structural and chemical characterization from the same region in a micro structure in the last ten years [1], [32]. This method has been widely used to comprehend the impact of micro structural flaws on the mechanical characteristics of metallic materials [33]. This technology, however, has never been used to develop a systematic structure-property correlation in these fly ash composites. The main problem is the expertise and cost of using a Focused Ion Beam (FIB)-based sample preparation technique to prepare samples for correlative micro structural analysis across various length scales, as well as the reproducibility of the data produced. Understanding the intricacy of crystal structures associated with these composites is another challenge. Understanding crystal structures could be the first step toward addressing micro structural flaws that occur during composite processing. As a result, the methodology described above has a lot of potential for future research in the field of fly ash.

### **Conclusions**

Designing composites with high specific strength is currently a pressing requirement. Fly ash particles have demonstrated a great deal of promise as reinforcements in lightweight Al alloys, resulting in improved mechanical characteristics. The hardness, tensile, and compressive strength of these composites all increase as the fly ash content rises. Density, on the other hand, falls when fly ash content rises. However, before employing these materials in large-scale commercial applications, comprehensive micro structure study targeted at systematic structure-property correlation is required. Correlative microscopy, as a method of characterisation, has a lot of promise for comprehensive structural and chemical characterisation of these materials. This methodology could be utilised to gain a better understanding of how these materials' micro structure evolves.

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# CHAPTER 16

## THE MANUFACTURING OF FLY ASH BRICKS -A REVIEW

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### **Abstract**

Brick is a key component in the construction of any building or other structure. Due to the growing need for building materials for construction projects, few alternative techniques to replacing traditional bricks are being developed. One of these choices is fly ash brick. Fly ash, Granite dust, sand, cement, and other elements are used to make these types of building materials. In addition, water is added in equal parts to this mixture. When compared to traditional bricks, fly ash bricks are both lighter and stronger. The pollution levels in the atmosphere can be reduced by making these bricks.

*Keywords: Fly ash, Granite dust, cement, Low CO2 emission, Reasonable cost.*

### **Introduction**

Fly ash bricks are one of the alternate techniques to replacing traditional bricks in construction. The brick must be burned to achieve stiffness in the traditional brick-making process. As a result of this process, tremendous amounts of CO<sub>2</sub> are released into the atmosphere, causing massive pollution. The concept of Fly ash brick was created to help overcome this difficult circumstance. The main component of fly ash bricks is fly ash, which is commonly found in our country's thermal power plants. Cement, sand, and water are also added at the appropriate concentrations. The heating or burning procedure is not necessary in the manufacture of fly ash bricks. Overall, replacing normal bricks with fly ash bricks is the only way to control global warming and CO<sub>2</sub> emissions into the environment.

### **Fly Ash Source**

Fly ash, which is produced in thermal power plants, is the primary raw material used to make fly ash bricks. Thermal power plants produce the majority of the energy in our country. Fly ash is produced by industries that utilize coal to generate energy, and this fly ash can be processed with a cyclone converter before being used as a raw material for making fly ash bricks.

### **Fly Ash Brick Making Process**

The procedure of creating fly ash bricks is quite straightforward. Pozzolana cement mix takes a long time to set. It's the same process as manufacturing cement in a factory. Only clay and limestone, as well as coal and gypsum, are burned in this process. It is then combined with cement and stored for

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moulding. The bricks in the moulds are let to cure at room temperature without being heated or burned. The curing procedure took another 28 days. After that, the bricks are taken out of the moulds and used as building materials.

### Literature Review

Basumajumdar et al. discovered that when fly ash and lime react together, they have cementation capabilities. He also noticed that when lime is mixed with oxides from fly ash, such as silica, alumina, and iron oxides, it creates distinct bearing phases, which then convert into hydrated forms when exposed to water.

Gadling et al. investigated the differences between regular clay bricks and fly ash bricks. There is a possibility of minimizing solid waste disposal by utilising fly ash, which is a natural waste product. Manufacturing these bricks with a 40 percent fly ash and 60 percent clay composition would be the best alternative source to replace traditional bricks. Fly ash as a raw material can be an effective way to substitute clay bricks because it saves land while also lowering pollution.

Cengizler et al. investigated the ways for making fly ash bricks. Furthermore, it was said that non fired fly ash bricks were believed to be beneficial to the environment and ecologically sustainable development.

Ravi Kumar et al., 2014 investigated the behavioural features of fly ash bricks by varying the concentrations of fly ash, cement, gypsum, sand, and lime. To compare these bricks to standard bricks, various tests such as compression, water absorption, and weight were done. When compared to regular bricks, fly ash bricks are proved to have higher compressive strength.

### Conclusion

Fly ash bricks are one of the most effective alternatives for reducing the demand for traditional bricks. The production costs and raw material requirements are both very low and affordable. It is much lighter and more durable than traditional bricks. It has a high rigidity and absorbs little water.

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# CHAPTER 17

## LINKAGE OF TEACHER EDUCATION INSTITUTIONS

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### ABSTRACT

Relatively little attention has been paid to how educators actively construct linkages between different forms of knowledge at the micro-level of educational activities in campus-based teacher education programme. The current article addresses this gap in existing literature by empirically examining how educators construct theory-practice linkages through the use of practice-based teaching at campus. By employing analytical tools associated with a sociomaterial perspective, the article demonstrates the value of applying this perspective to examine the role specific art effects can play in forging linkages between different forms of knowledge, and highlights the creative and constructive work required by educators for such linkages to be made transparent in a higher education context. The analyses exemplify that an analytical focus on identify how educators work to create linkages between theoretical and practical knowledge in campus-based teaching. Specifically, the examples demonstrate how these forms of knowledge are put in relation to each other in different ways and to different purposes; for instance, to explore the theoretical underpinnings of a practice-based, to validate the practical use of with claims of research, or to put claims of theoretical knowledge to the test with practice-based.

### INTRODUCTION

In the field of teacher education, a key challenge over several decades has been to establish relations between different forms of knowledge in ways that support student learning and reduce the “practice shock” of novice teachers. Traditionally, many have characterized the challenge as one of bridging the “theory-practice gap”, applying a distinction between so-called theoretical and practical knowledge to denote the knowledge cultures associated with higher education-based and school-based components of teacher education programs.

The current article addresses this gap in existing literature by examining how educators construct theory-practice linkages through the use of associated with professional practice in schools when teaching at campus. Typical practice-based include teaching materials, local curricula, teaching methods and pupil texts. By employing a sociomaterial perspective with analytical emphasis on how these are mobilized in specific educational activities, The analysis also highlights the considerable creative and constructive work that is required from educators to successfully re-contextualise such artifacts to learning situations in a higher education context.

Empirically, the article foregrounds the campus-based teaching of a specific group of educators in Norwegian teacher education, referred to in this article as *hybrid educators*<sup>1</sup>. Working both as teachers in schools and educators in campus-based teacher education, hybrid educators are particularly associated with an expectation of “building bridges” between the two knowledge cultures they work in and unlike

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campus-based educators, they have a unique opportunity to bring practice-based from the school-context to the higher-education context.

### **BRIDGING THE THEORY-PRACTICE GAP IN TEACHER EDUCATION**

A vast line of literature addresses the challenge of creating meaningful connections between the different sites of learning and forms of knowledge that make up teacher education programs. These strands of literature focus on the construction of knowledge connections at different levels of the education program, for instance by foregrounding curriculum content or program structure. In the following, the body of literature related to how educators work to create theory-practice linkages in the campus-based context will be emphasised.

A considerable body of literature foregrounds the notion of coherence as a means of creating connections between different forms of knowledge. This body of literature has produced several concepts for describing aspects of coherent teacher education programs—such as structural and conceptual coherence—foregrounding meaningful interrelationships between program components and different actor's perceptions and experiences of coherence between these components.

In this literature, the activities of the teaching profession that educators should foreground at campus are referred to as a characterization of quality in teaching preparation, core practices are explained as practices that occur often in the teaching profession, and it is suggested that a focus on these in both teacher education and work placement will make the connection between theoretical aspects of higher education and aspects of professional practice more evident for student teachers.

The current article further expands on existing literature by analytically foregrounding the micro-practices involved when educators attempt to re-contextualize practice-related to campus-based teaching, demonstrating the different roles specific can play in forging linkages between forms of knowledge.

### **THEORETICAL PERSPECTIVES**

A sociomaterial perspective offers a fruitful framework to investigate linkages between forms of knowledge in campus-based teacher education by highlighting knowledge as embedded in the routines and materials of professional practice. From this view, professional practices are considered to be processes that take place within social systems that have evolved culturally and historically, and the professionals make use of in these processes are historically laden and carry specific constraints and affordances that shape and guide interaction with them. Thus, the task of forging stronger relations between higher education and professional practice is not simply a matter of “bridging theory and practice”, but rather involves the bridging of two sets of institutional practices and that have historically had two different purposes; whereas higher education institutions have been oriented towards the production and dissemination of research-based knowledge, work in schools is oriented towards educating children and youth.

In this study, the practice-theory distinction is applied to represent these two forms of knowledge. The “theoretical” knowledge associated with the higher education context is often characterised as formal knowledge consisting of research-based, methodological, theoretical, and codified aspects. Some typical examples of associated with this domain include concepts, theories, research articles, general principles or abstract models. However, many researchers have emphasised the challenge involved in demonstrating the relevance of theoretical knowledge for practitioners, and the challenge involved in “translating” abstract knowledge from the higher education context to the specific tasks and requirements of professional practice. “Practical knowledge” is primarily associated with the tasks and demands of

professional practice and can be characterised as situated and contextual, bounded by time, space and task. In schools, typical associated with professional practice include teaching materials, pupil texts, local curricula or specific teaching methods. In order to perform school tasks, teachers are found to apply knowledge that can be characterised as primarily tacit and personal, shaped by experience and reflexivity.

A sociomaterial perspective assumes that the physical and conceptual associated with specific knowledge domains carry beliefs, knowledges and logics from the culture they originate from, and offer constraints and affordances for use. This assumption makes the work of hybrid educators an interesting empirical case for examining knowledge relations in teacher education: The hybrid educators literally bridge two institutional cultures by virtue of working both in schools and higher education, and they are specifically tasked with “bridging” this cultural and epistemic gap. However, the specific role that play in teacher education will depend on how they are taken up and mobilised by educators in classroom settings, including how they are related to other conceptual and material. Furthermore, that travel from one culture to another typically need to be translated and re-contextualised as they enter a new setting; when practice-related are introduced in a higher education setting, it is not necessarily clear how linkages are to be made between the knowledge that is valued in higher education, or how that can be mobilised to support student learning.

## **METHODOLOGY AND ANALYTICAL APPROACH**

The data used in this paper is derived from observations and in-depth interviews of three hybrid educators at three teacher education institutions. This group of educators are particularly associated with an expectation of “building bridges” between the two knowledge cultures they work in and have a unique opportunity to bring practice-related from the school-context to the higher-education context. Even though several teacher education institutions have long traditions of including teachers in campus-based tasks, for instance as part of university-school partnerships, there is not an established tradition. hybrid educators; thus, the tasks they are asked to perform as part of teacher education programs vary from institution to institution.

As the concept of Bloom’s taxonomy is not explicitly mentioned in the evaluation criteria, the extract provides an example of how the educator has worked creatively to identify underlying linkages that the practice-based provides and how these linkages are made relevant for student teachers as the re-contextualised to the higher education context. In the interview, Emma elaborates on the challenge involved in re-contextualising practice-related to the higher education context in ways that make them meaningful for student teachers:

This example shows how theoretical knowledge is used as a tool to analyse conceptual underpinnings of a practice-based. By positioning aspects of theoretical knowledge as relevant for approaching the practice-based, the two epistemologies are promoted as interconnected forms of knowledge.

## **THE WHEELS OF WRITING**

In this example, theory-practice linkages are constructed when theoretical knowledge is mobilised to challenge existing practice and to validate the use of the practice-based. Linkages are further forged as the educator uses the to position theoretical knowledge as a form of knowledge that can shape and challenge professionalism and professional development.

In this extract, Ingrid teaches a seminar on written competence and initiates an activity with the “wheels of writing” as the foregrounded practice-related. The wheels of writing are developed by

Norwegian researchers as a tool that can be used in all school subjects to highlight different aspects of written texts. Ingrid foregrounds paper versions of the two wheels; they are made of paper layers that are connected in the middle and can be turned in order to match categories of writing; for instance, purpose of writing and acts of writing.

### **PUPIL TEXTS AND TEACHER FEEDBACK**

This extract provides an example of how theory-practice linkages are created when theoretical knowledge is mobilised as a form of knowledge that can be put to the test by practice-based. The example further illustrates how these linkages remain latent when they are approached in a way that provides students with an example of solving a task of professional practice without making use of the linkages that are initially mobilised.

### **CONCLUSIONS**

The article set out to examine how educators construct theory-practice linkages through the use of practice-related when teaching at campus. By employing a sociomaterial perspective with analytical emphasis on how these are used in specific educational activities, the analyses demonstrate the role can play in forging theory-practice linkages. Providing empirical examples of how educators put different forms of knowledge in relation to each other when from professional practice are used, the analyses also highlight the considerable creative and constructive work

Specifically, the examples demonstrate how these forms of knowledge are put in relation to each other in different ways and to different purposes; for instance, to explore the theoretical underpinnings of a practice-based to validate the practical use of an with claims of research, or to put claims of theoretical knowledge to the test with practice-based. The analyses pinpoint the challenge involved in making theory-practice linkages available for student teachers by providing an example of how these remain latent when pupil texts are used to provide student teachers with examples of solving a practical task without making use of the linkages that were initially mobilised. This use of practice-related can be characterised by a tendency to do what referred to in their study as “doing the job for the students”, and the findings align with claims. as they illustrate how from professional practice become instrumental “recipes” when educators use these in ways that provide students with examples of what works when completing

Specific professional activities. The analysis suggests that this use of practice-related may be a result of the hybrid educators’ role as both teachers in schools and educators at campus, and their wish to provide student teachers with what is referred to in the interviews as “authentic” examples that they can “transfer” to their own professional practice.

The educators use and tracing the knowledge linkages that are made relevant with these, the current paper has implications for how we can understand and conceptualise efforts to strengthen theory-practice linkages in campus-based teacher education with an increased focus on materiality.

The sociomaterial conceptualisation of how educators’ work to construct knowledge linkages that is demonstrated in this study, is especially helpful as new educator roles—such as the hybrid educator role—are created in the higher education context with the intention of “building bridges” in the third space between higher education components and practice, without a specification of what this work entails for educators when teaching at campus.

A dimension that could benefit from further research is the perspective of student learning, as this article does not account for students’ perceptions of knowledge linkages created. The findings raise a more general question of the knowledge hybrid educators bring to the campus-based context, and further

research is needed to explore how their knowledge as both practitioners and educators can be put in fruitful collaborations with other actors in order to strengthen connections in teacher education programs.

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## CHAPTER 18

# INTEGRATING TECHNOLOGY INTO ENGLISH TEACHING AND LEARNING IN CHALLENGING TIMES: OPPORTUNITIES AND POSSIBILITIES

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### **Abstract**

In all corners of the globe, COVID-19 is the only title banging as an echo. This pandemic disease has put people on the line and stopped them with its terrifying and serious effects. It has stamped its heavy foot with a reverse impact on the learning scene and noticed a significant improvement in the teaching model. Moreover, the COVID-19 mushroom forced all schools worldwide to stop face-to-face teaching temporarily and redirect them to online schooling. Governments in all countries have laid down new requirements and launched a new undertaking to reduce academic losses. But the move looks pretty myopic in due course. The current state of ELT learning is examined in relation to the COVID-19 pandemic in the discourse. In the face of this, the teacher had to adapt at an immense pace, not only to new methodological methods but also to their own confinement, with high levels of stress. The worldwide health emergency situation triggered the concealment of individuals. The goal of this study is to suggest a new method for neuro-educational contributions in the management of emotions and motivational mechanisms that would enable students to learn meaningfully in a proposal to optimize the work of educational professionals in the present context of a pandemic, using knowledge and information communication technologies (ICT). The symbiosis of ICT and neuro-pedagogy can contribute greatly to today's paradigm shift. This paper provides a study of the current scenario of opportunities, obstacles, and possible solutions for virtual teaching.

*Keywords:* pandemic, ELT, discourse, paradigm, pedagogy, information and communication technologies.

### **Introduction**

In the past, teachers were venerated as half-gods and regarded as the only way to teach students. Furthermore, the effectiveness of truth and devotion to teaching were brought to bear. They were called the encyclopedia of thinking, and they not only provided the basic contents of the subject but also the moral and ethical extracts. They took the students to specific locations such as warehouses, fields, or any other area to provide useful knowledge or practical training for easy comprehension. But it was a boring task because they were still dangerous and difficult. Therefore, some institutions integrate virtual learning to deal effectively with the toughest sections of the subject. Using ICT-enabled tools, students can comprehend the grey content of subject matter with comprehensive knowledge. It is the only forum for all educational institutions, regardless of their scale.

This learning stratum is transformed into a new method of English language teaching. Digital teaching through the online platform also provides help for remote teaching students in addition to classes or subjects on ELT through the establishment of several universities and colleges abroad. But now the word

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has built a niche in the field of education and entered the classroom with a heavy hold. Institutions, regardless of degree, have immersed themselves in virtual teaching, but have at times ended up with technological shortcomings, which first and later may impede students' interest. It has skewed the teaching culture as a whole, as an online class is a completely new practice for different teachers and students. Learning is disrupted when educational fields are usually skewed by a bunch of barricades. This unfrequented route of inexperienced English language teaching has increased their forum to satisfy the appetite of institutions across countless channels to maintain this pandemic moment. However, everything depends entirely on sufficient demand for the internet, computer devices, and student-friendly activities backed by the teacher's expertise in language teaching.

### **Major challenges**

At the end of March 2020, various institutions had to stop operating indefinitely due to the deadly COVID-19, and by the end of the month, almost 190 countries had stopped operating, distressing 90 percent of students worldwide. The rate of these closures and the hasty step towards remote learning allowed very little time to prepare for the distribution of information.

Many people worldwide, regardless of their social positions in various flora, have widely debated the impact and transformation of English language teaching. Teachers are pursuing various tools, such as Google Classroom, Microsoft Teams, Zoom, Google Meet, and Cisco WebEx, to enhance the thinking of learners through ICT. While several online outlets with many updated features have arisen to assist professors, teachers find it a herculean task to concentrate students' attention on the subject matter during the pandemic. Certain organizations have formed their own platforms and connected with software alliances. Furthermore, after the review and consultation, teachers have expended much energy structurally posting stuff using a standardised and singular approach as laid down by staff at their respective institutions. The overall arrangement of online classrooms also offers teachers the ability to work individually with a student and can bring students who have been previously overwhelmed to the verge of a psychological breakdown. In addition to the students, their parents have conveyed their heaviness about discontinuing education at home. Parents' vision will be to increase their language skills by investing the greatest amount of time in the education of their children and by spending a great deal of time selecting the top educational institution for their child's education. However, even as a temporary resort, this transformation of learning will sadden parents' feelings. On the contrary, a few students were exceedingly pleased to finish the tasks unexpectedly, such as wearing their uniforms, commuting, preparing for ELT homework, early morning wake-up, endless hours, and the appalling conditions when working on sheets or activity papers, and so on.

### **Interference of parents in ELT**

The overreaction of parents in some institutions is concerning because they are interested not only in their children's activities but also in teachers' activities. You remain close to learning from your ward and want to interfere with learning or the hunt for gaps. In addition, telephone calls or text messages to teachers are made by certain parents at strange times. The emotional anguish of the teachers has been caused, and this has led to chaos. In virtual education, the definite characteristics of teaching are totally ignored, such as nonverbal contact, live demonstration, practical training, and physics.

Because digital teaching is taking off as a transparent framework as a transparent teaching method, advanced planning is essential. That is why, in order for these services to be distributed among students, the educational material should be checked and authenticated. The key components of virtual learning are curriculum creation, analysis, delivery, evaluation, and progress monitoring. While students are outstanding

technology experts, they complain about network issues and problems with apps. Currently, the online class is the only tool on the unbroken road of learning. Despite the scary scenario with many trials and tribulations, it began its journey to heighten the grey matter of learners. In managing online tasks, urban students execute power packages.

**On the other hand, rural students face many hurdles in E-Learning ELT and they are the following as enlisted:**

- The shortage of gadgets is due to weak economic conditions.
- Help for educational applications are insufficient.
- Low or variable access to the Internet
- Computer or platform management unfamiliarity
- Inadequate parental guidance due to parental non-literacy
- Lack of motivation and interest
- A lack of a favorable climate for learning
- The shift from mass to solo presence in the English Language Teaching-learning atmosphere
- Excessive screen exposure leads to health risks.
- Depending solely on teachers' physical appearance
- Failure to provide funding and education

It is a chief duty for teachers during a pandemic to animate the thinking of the students through the ICT system, regardless of whether they are rural or urban. The object of learning is different for people to call it social status, the accomplishment of knowledge, the generation of income, etc. According to demand, student attendance varies on the online course. Students who have trouble sitting consistently in class will find it easier to learn virtually, as they can turn the camera off or suppress the sound. Even if the schedule is correctly determined for successful content diffusion, an important part of the content can only be shared with students, and the comprehensive explaining session cannot be held.

Like face-to-face contact administered In addition to their teaching, there's a lot of pressure for repeated calls to be disconnected, students' feathers to be approached, parental intervention, and family-to-work struggle. There are few opportunities to determine whether the student has understood an ELT lecture.

### **Probable Remedies**

Governments should research the issue and make subsidized Internet plans and resources available to all kinds of learners through various networks for needy students. Most TV channels are specifically streamlined for children and others.

Cartoon material, series, films, tracks, news, etc. The hectic strain of teaching via on-line platforms would end if the government opened or redefined existing television channels into recorded or live educational networks to make them the material for all classes. It's time to screen.

Student health risks will be minimized, and the burden on learners will be reduced. Topic name schedules can be prepared and transmitted on the news channels, and other relevant updates can be transmitted on all channels. Since schooling is an eye-opener for people, it can be abused by COVID-19 in spite of its bullies. Wissenschaftler and physicians told people to set up the screen so their eyes were not overwhelmed.

As the maxim says, learning is always and continuously changing. This current unfortunate situation should be seen as a silver line in the dark cloud, and schools, along with government sectors, should improve digital education in order to develop new strategies for broader learning. The lockout also

makes it impossible for the more affluent parents in urban areas to support them by setting up e-learning sites, looking at them round-the-clock, and coping. Both parents work from home for primary and primary children, and it is a thorny role for parents to play between their work, their home, and their online education.

Some students typically choose to pursue higher education at universities outside of Canada. It is called social status, and these universities, in turn, benefit significantly from the capital. But at the moment, at least in the following years, it has been made clear that the cross-border migration of universities in countries already under financial pressure is going to take place and contribute to the main monetary risks for these countries. Education institute managers are charged with an extraordinary lockdown of cash flow.

Because of the high risk of pandemic, many parents would not send their higher education students abroad. The frightening dent of academic study and the unexpectedness of institution openings have made use of an effective online learning solution in English language teaching and learning. In the face of this crisis, brilliant use of technology in English language education would usher in a new era in the field of language education, when students would be able to reach the vast majority of faculty worldwide. Faculty productivity and the efficient use of ICT resources are crucial criteria foreseen for the future and professorial experience with digital teaching technology. The crisis has undeniably accelerated the acceptance of educational technology and will lead to the country's long-term improvement in digital learning infrastructure.

### **Responsibilities of stakeholders**

- Education Administrators-
  - Simple design and presentation of the course material
  - Assign an appropriate forum and measurement model.
  - Inspiring and giving guidance to inspire students
- The parent's role is to monitor and review the learner's progress on a daily basis.
- Concentrate on overall physical and emotional health.
  - Offering an incentive to grow the potential of children to observe
  - their actions and other behaviors

Government role: Offer all educators, particularly those in rural areas, sound institutions and a uniform ICT platform.

- Make internet access packages subsidized.
- Designate TV channels for learning purposes only.
- Distributing free student books and notes

### **Opportunities and possibilities**

The effects of the pandemic epidemic persist for years, as is clear from a study conducted intermittently by researchers. Currently, the trend is up, and the momentum for virtual learning will be immense. India has decided to teach several people in advance through online platforms for students. And it is proven that our nation has one of the world's biggest 4G networks. In almost every corner of the world, 4G access persists. The cost of the data is very fair. It is more desirable with the support of class materials that are deciphered from adequate networks, and learners treat their learning experience as an intelligent package. By offering the learner at their doorstep many lessons on ELT, the vast command of virtual

classrooms will attract the attention of infinite students. Students can access the subject material from every nook and corner of the world on ELT.

### **The Present Scenario in the English Teaching-Learning Process**

The new pandemics imposed a new, web-based teaching and learning of the truth just as we thought we had reached a certain consensus among ourselves or within our consciousness. It was as hard for us as it was for them to climb a steep mountain in view of the Albanian truth, a post-communist country that has been undergoing a social, economic, and cultural transformation for at least 30 years. COVID-19 changed the worldwide education of our children in a matter of weeks. In 186 countries worldwide, the number of children impacted by school closures was calculated to be 1,2 billion, and it had to depend on what is called "distant education," virtual learning, online research, or home-ground learning. Therefore, student channels like Google Colleges, Skype, Zooms, What's Apps, Vibrant, e-mail, or the mass media had to be used.

Let us mention the case of the launch in this House of the BBC of a new regular education programme to host celebrities (lesson 0). It is important that every child continues to learn, and the lessons we teach will make sure that they are enjoyable. Alice Webb (BBC Head of Children's Program) considering that this unprecedented and unpredictable pandemic shocked us, it was the best response ever, and it was necessary to acknowledge the efforts of teachers and other valuable contributors. Personally, we do not want to slip into self-confidence and commend pandemic education as a current top priority or the method that will form learning better apart from appreciation. Even though many educators are not a temporary solution but a future innovation, particularly from well-developed countries, who find in-house or virtual teaching. For teachers and third-world students, we wish to be an exemplary case and to explore what it means objectively. We completely endorse some claims made by American parents as a teacher of English and parents of two schoolgirls who call "zoom schools the traditional nightmare or hell only." We have posted a few basic questions that sound difficult to answer properly when representing the truth. How do we teach a child, 6–9 years old, how to combine English verbs in plain language? How does their negative and interrogative structure come to be established from home, where we do not have a board? How can the additions of the auxiliary verb "to do" be clarified in negative and questioned phrases, where it originated and the position that such constructions are not experienced in India?

How do we teach a child between 6 and 9 years to speak English correctly if the sound is torn or they wear masks? How can we search for English terms and phrases if we can easily cheat on the screen while dictating words? How can tasks be delegated to groups or pairs (such as on-site dialogues or other speaking activities with the intention of correctly utilizing English) if there is an Internet signal? Interaction is teaching. How do students automatically ask questions on subjects or topics that are confusing or, at present, express opinions on those subjects they are interested in? Everybody's all right with each technology, but this isn't the problem in our case. The problems it causes are of psychological, social, and emotional origin and not technical origin. Psychology emphasizes the importance of students' learning social context, interpersonal interactions, and emotional well-being. Our children and students currently have limited access to their peers when they go home. Students of what we have recently termed "bubble classes" or students. Such a retreat can inexorably lead to poor results and can impact the social and emotional wellbeing of children. In order to understand this, the importance of role-playing and learning by playing as essential and highly efficient models in English language teaching should be discussed here. They are demanding interpersonal interactions and contact between different students, which is not virtually feasible.

To sum it up, we believe that teaching and learning are more than filling out a form in Excel, writing your essay in Word, submitting an e-mail, listening to music, playing a game, watching a movie, flipping through a Face book friend's video, commenting on Twitter, etc. It is for the psychological and emotional health of our children and the educational and economic well-being of our children. English teaching is not only success-related, but, according to Chomsky, without expertise, there is no performance; without information, there is no doing; without precise fluency. To better serve our humble missions, we, today's teachers and potential projectors, should take into account the comment made by a student on the BBC that it would get him back on track before reorganizing education with such flickering excuses as the present educational system was losing its significance or relevancies.

### **Conclusion**

It is certain that Internet access practically excluded a large proportion of students from the virtual classes that led the non-participating students to have a prominent impact and root out the non-learning government. A newer edition of technology has contributed to the revolution of today's learning. Both types of learners can achieve a high-quality education with state-of-the-art tools and cannot be substituted by traditional white-crayon and blackboard teaching methods. As a result, this based technology should be a torchbearer rather than a nightmare. In addition, a more inspiring, adaptable, open, and enjoyable journey should be possible. Since numerous qualified technocrats are being surfaced, our government has to be supported innovatively with guidance and resources to provide fruitful education. While the face-to-face interface is often seen as the largest mode of communication compared to the much more impersonalized nature of remote learning, in current circumstances it cannot be employed. Investigators have stated that the abrupt and obligatory introduction of technical training would impact teachers' and students' well-being. The government should, therefore, introduce appropriate steps and initiatives to enforce a systematic strategy for disseminating educational content to all learners through public platforms like TV. Even the students from rural areas who are introduced to the main layer of urban students will feel a hunger for information without investing a penny when introduced. The psychological strain on parents can be minimized by the issue of free school books, notebooks, and worksheets to all threshold students. At present, not only teachers but also parents and educational authorities bear the primary responsibility. They should come together, spend lucrative time creating a diverse forum, and develop important content for the subject in an enjoyable setting. The acceptance of teaching-learning technology has contributed to an unprecedented shift from teacher-centered to student-centered learning. It should be instilled, strengthened, and animated by all people in the minds of ELT learners.

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# CHAPTER 19

## APPLICATIONS AND POSSIBILITIES OF AUGMENTED REALITY: DEMAND OF INDUSTRIES 4.0

*Jash Nimesh Kansara*<sup>1</sup>

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### **Abstract –**

Augmented Reality (AR) is the experience of the surrounding in which the things are powered by computer machine generation system. This content contains the introduction, first use, invention of augmented reality, various augmented reality, demand in the industries and day to day challenges and possibilities. The early augmented reality which provided mix reality experience for the people were generated in 1990s. The environmental information becomes digital with the implementation of augmented reality.

*Keywords - Augmented Reality, Computer generated, Information, Navigation, Recognition*

### **1. Introduction**

**G**H4720Li Augmented Reality(AR) is the greatly influenced method to show digitalized information in the list of physical world by connecting people and increasing the outcomes. Industrial augmented reality offers the good path to make and output the easy workable instructions in the real world workplace. Augmented Reality is reforming how the workers will gain knowledge and engage with it in terms of digital manner with their surroundings. These will result in fast inputs from employees, low manpower and good decisions. Augmented Reality system instructions are easy for the employees and gettable on large scale across the globe. Many of the industrial workplaces are understanding and implementing the value of AR systems. Industrial Augmented Reality has wide range of day to day usage. Augmented Reality contains visual and many other data into the world to empower the employees. AR is system which has a huge growth in terms of education. Some research works also were carried out in the education sector. AR is being in many sectors in educational sectors.

### **2. Applications of AR in Industries**

The first AR was developed by Evan Sutherland in the year 1968 but the technical word AR was termed by the researcher Tim Codell. A cinematographer, Morton Heilig, was the first to gain AR for the first time in history upto some extent in terms of pictures, images, sounds. There are many industries in demand of AR system like: Sports, Retail, Automotive, Healthcare, Educational Fields, Training Centres, Gaming Sections, Defence Sector, Military Purposes.

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### **3. Different Types of AR**

#### **3.1. Projection based AR**

Projection based AR is described as the video projected method that expand visual information by implementing pictures to 3D area, that belongs to Spatial Augmented Reality in further aspect. The projection based AR reflects good lighting representation which is better than ordinary lighting methods. This methods saves high quality pictures/videos, and changes substance shape/size with respect to time.

#### **3.2. Recognition based AR – Marker based**

Once recognition is done, it gets replaced by marker on screen with a 3D technology of the corresponding object. This allows us for investigation of object in deep and angles. Rotating the marker would rotate the 3D imagery as well. Recognition based AR is used in education. Markers of more than two objects are kept together. The tool identifies various markers and simulates relationship among them.

#### **3.3. Location based AR**

It is most utilized applications of AR. Though human eye is known to be best camera in globe, there are limitations. We are unable to see in less light and sure as anything, your eye cannot see in infrared. While car driving on a road in fog, edges of road may not be clearly visible, which lead to casualties. Advanced cameras are specially to see surroundings in low light conditions can be used to outline the road boundaries within which the car should stay. An AR app known as 110 stories allows you to see the building as an outline.

#### **3.4. Superimposition based AR**

It gives optional view of objects, either entire view of object or by replacing with AR vision. Doctors can use the technology to examine patient from various angles in real-time. In military applications, it results in several views of a target without extra data in text and blocking vision of soldier.

### **4. AR: The Limitless Possibilities**

Augmented Reality is possible in various fields but limited to:

#### **4.1. Military**

First Person Shooter (FPS) games, of course. Most games display good use of AR such as building name, members and weapons as we move mouse on them, and showing way to next point without having to shift focus.

#### **4.2. Vehicle Windscreen**

First Heads Up Displays (HUD) are glasses, windscreens, surfaces which allow viewer to see but add extra information over (or around) some specific objects. When we move cars, bikes, trucks, kayaks (anything under sun) in game, lot of information is displayed on screen. The innovation and possibilities do not end here. The fact that AR can provide more information and with minimum distraction makes it a prime candidate for the medical sciences.

#### **4.3. Shopping**

First Heads Sale make our world perfect, so developer seek to connect technology to sales. AR may prove to have immense impact on retail sales. Technology is based on camera (or multiple cameras) for

capturing image of shopper, and superimposing cloth variety of ideal size over shopper's body (instead of that of the model used in the advertisement).

#### **4.4. Tourism**

Tourism is another industry that may/can utilize AR to its advantage. Travel is both a luxury and a necessity of modern life. No matter what the reason be, when travelling, we are always looking at things or looking for something. AR search engine give you every data without map.

#### **4.5. Architecture and Real Estate**

We have seen in either of the movies 'Prometheus' or 'Avatar', about a hint of how AR can help in architecture. AR can help visualize structures before they are actually built and simulate their behaviour under various weather conditions. It also help convert 2D print into 3D and protect time, giving good idea of the building.

#### **4.6. Sports and Entertainment**

Only work & no play make AR dull. A prime example is displaying the score and names of players directly on the field of play. Advertisers are using AR for showing advertisements in strategic positions on field and having it blend with real-world elements. AR method is used in amusement park rides and stalls where children can play with virtual animals ranging from small puppies to giant dinosaurs.

#### **4.7. Social Media**

All of us use social media and utilize full amount of the technology. People are having fun with AR stickers and entertain with many AR objects filters in camera. We have seen and used in Instagram, Snapchat and Facebook. It detect the face and put some object on it. We can play games and quiz as well.

#### **5. Future of AR**

Structure failures and improper position of safety rules results in injury/death and other fatalities. But this casualties can be overcome by means of augmented reality. When areas are relocated, resized, or newly constructed, augmented reality can help employees to catchup where things can go worse. In the similar fashion it also helps the managers in streams like mining, timber, various factories and industries to remove the injuries with the help of AR.

#### **6. Conclusion**

This particular review of the research work displays that AR technology has the power to be updated in various sectors or streams.

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# CHAPTER 20

## RIGHT TO ENVIRONMENT

*Moumita De*<sup>1</sup>

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### ABSTRACT:

Human Rights and the Environment are interrelated with each other. An environment needs to be safe, clean and healthy for the betterment of each individual. Environment Rights means any proclamation of human rights to environment conditions of a specified quality. An Environment should be free from air, noise, water, radioactive pollution. There are various types of human rights related to the environment. Environment rights are composed of two types:-

1) **Substantive Rights** – These Rights are those in which environment are directly effects on the enjoyment of the rights itself. It comprised of Civil and political, Economic, social and cultural rights, Collective Rights.

2) **Procedural Rights** – These rights are basically all the formal procedure where all the legal steps are required. It includes access to information, public participation and access to justice.

Every human has a right to live in a clean and healthy environment. This is a general right which is guaranteed by many constitutions all over the world. Human rights belong to everyone, and we do not tolerate human rights violations in any form. We recognize our ability to contribute to positive human rights impacts. We are committed to avoid any adverse human rights impacts and to address and mitigate such impacts should they occur.

**KEYWORDS:** *Environment, Human Rights, Right to Development, Right to life, safe, clean, healthy life.*

### INTRODUCTION:

**T**he protection of Environment is a global issue and it is not an isolated problem of any area or nations. Professor Paras Diwan has expressed the view that “traditionally we are pollution loving nation”. According to him:

“We pollute air by bursting crackers on Dussehra, Diwali and on the occasions of marriages and other festivals. We pollute our rivers by disposing of our dead bodies and all other human and other waste. We take out so much wood from our trees have become scarce. We are primarily a vegetarian nation, but our wild life is on the verge of extinction. We are the lovers of Cleanliness and therefore broom out all our household and other waste on the public streets. Any space is good enough for us to ease. We are a country which believes in open latrines. Municipalities are oblivious of their duties and all city wastes, human and industrial effluents are allowed to flow in open drains and to flood the streets. We are equally fond of noise pollution. Godmen’s voice must be heard by all, day and night and our Ratjagas, Akhandpaths and Azan must use loud speakers and amplifiers; no one should be deprived from hearing God’s and God man’s

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voice- and Gods too are for a way beyond the hell and heaven. Our Voice must reach them; otherwise our spiritual needs will remain unministered. We are not less noisy in our secular matters. Our marriage and burial processions must be accompanied by bands, twists and bhangras.”

The concern for environment protection in India is not only seen in the recent activities, but it can be traced back to the periods of 321 and 300 B.C. In Kautilya’s Arthashastra it has been given that it is the dharma of each individual in the society to protect the Mother Nature. The important position in the ancient time is the trees, water and land and people used to worship all these for the protection and preservation of our environment.

India is the land of rites and rituals. India is a secular country and thus all major religions of the worlds are representing in India.

### **Three Generation of Human Rights:**



Czech Jurist Karel Vasak at the international Institute of Human Right in Strasbourg was proposed the division of Human Rights in the year 1979. He got influence from the three watchwords of French Revolution “Liberty, Equality and Fraternity”. The Universal Declaration of Human Rights (UDHR) includes rights of thought of as First and Second generation.

The Generation of Human Rights is:

- First Generation sometimes called Blue Rights.
- Second Generation sometimes called Red Rights
- Third Generation sometimes called Green Rights.

### **Third Generation of Human Rights:**

In the 1977 article, Vasak credits the UNESCO Director –General Amadao-Mathar M’Bow from the Senegal for creating the term “Third Generation of Human Rights”. It was meant to emphasis on the right to development, peace and a healthy environment.

This generation is also known as Solidarity Rights and Collective Rights. These rights are totally different from First and Second generation of Human Rights as it expressed in many progressive documents of International Law including the 1972 Stockholm Declaration of the United Nation Conference on Human Environment, The 1992 Rio Declaration on Environment and Development.

It Includes:

1. Group and Collective Rights
2. Right to Self-Determination
3. Right to Economic and Social Development
4. Right to a healthy Environment
5. Right to Natural Resources
6. Right to Communicate and Communication Rights
7. Right to Participation in Cultural Heritage
8. Right to intergenerational equity and sustainability.

### Origin of Environmental Movement in India:

Environment Movement occurs due to the protection of our environment. The concern for the protection of our environment can be traced back to the early twentieth century .At the International level, there are various conferences has been held, which are as follows:

- ✓ The first event was the United Nations Conference on Human Environment held in Stockholm Sweden which is also known as Stockholm Conference in the year 1972
- ✓ The Second event was published through a report which is termed as “Limits to Growth”
- ✓ The third was the release of a report on the Brundtland Commission entitled “Our Common Future” in the year 1987 which is also known as The World Commission on Environment and Development(WCED).It was chaired by the Gro Harlem Brundtland,former Prime Minister of Norway. Through this Report it was the first time that introduced the concept of Sustainable Development and described how it could work.
- ✓ Fourth Event was the Earth Summit in the year 1992 which is also known as Rio Summit as it was held in Rio de Jenario, Brazil.

### Millennium Development Goals:



The Millennium Development Goals consists of eight goals of the year 2015 that has been established by the millennium summit of the United Nation 2000. All 191 United Nations member states and at least 22 international organizations, committed to help achieve the following Millennium Development Goals by 2015:

- ❖ To eradicate extreme poverty and hunger
- ❖ To achieve universal primary education
- ❖ To promote gender equality and empower women
- ❖ To reduce child mortality
- ❖ To improve maternal health
- ❖ To combat HIV/AIDS, malaria, and other diseases
- ❖ To ensure environmental sustainability
- ❖ To develop a global partnership for development

**Sustainable Development Goals:**



The Sustainable Development Goals are collection of 17 goals. It was set up in the year 2015 by the United Nation General Assembly (UNGA) and are intended to be achieved by 2030. The mission of Sustainable Development Goals is "A blueprint to achieve a better and more sustainable future for all people and the world by 2030".

The Goals are:

- End poverty in all its forms everywhere
- End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
- Ensure healthy lives and promote well-being for all at all ages
- Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- Achieve gender equality and empower all women and girls
- Ensure availability and sustainable management of water and sanitation for all.
- Ensure access to affordable, reliable, sustainable and modern energy for all.
- Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
- Reduce income inequality within and among countries.

- Make cities and human settlements inclusive, safe, resilient, and sustainable.
- Ensure sustainable consumption and production patterns.
- Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy.
- Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
- Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
- Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
- Strengthen the means of implementation and revitalize the global partnership for sustainable development.

**Constitutional Provisions for protection of Environment:-**



Environment Protection Act 1986 is the India's first Environmental Legislation which was enacted through the 42<sup>nd</sup> Constitutional Amendment 1976 which incorporated Fundamental Right, Directive Principle Of State Policy and Fundamental Duties concerning for the protection of our environment and protection of forest and wildlife of country.

In 1980 Department of Environment came into existence but later on Department of Environment elevated to Ministry of environment, forest and Climate Change in the year 1985. The main Objectives are as follows:

- Protection of Environment and ensuring the wildlife of animal.
- Preventing and abatement of Pollution.
- Afforestation and regeneration of degraded areas.
- Conservation and survey of Flora, Fauna, Forest and Wildlife.

Our Constitution evolved over the years and is said to be the most amended constitution so far. The Fundamental Rights, Fundamental Duties and Directive Principle of state Policy vividly expressed over right to environment and there are various articles in our Indian Constitution.

The Constitution of India under part III guarantees Fundamental Rights which are essential for the development for the every individual. Right to environment is also a right without which development of each and every individual and realization of his or her is not possible. Articles 21, 14 and 19 of this part have been used for Environmental protection. According to Article 21 of the constitution, "No person shall be deprived of his life and personal liberty except according to procedure established by law.

The Fundamental Duties under the part IVA of the Indian Constitution impose duty on every citizen to protect environment. Article 51A (g), says that "It shall be the duty of every citizen of India to protect

and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures.”



Article 48 of Directive Principle of state policy under part IV of the Indian Constitution states deals with organization of agriculture and animal husbandry and Article 48A of the constitution says that “the state shall endeavor to protect and improve the environment and to safeguard the forests and wild life of the country”.

#### **CONCLUSION:**

Thus, Environment Protection is a part of our cultural values and traditions. Earth is our paradise and we have to protect our paradise. In Atharvaveda, it has been said that “Man’s paradise is on earth, this living world is the beloved place of all, and it has the blessings of nature’s boundaries live in a lovely spirit”. The knowledge of all the constitutional provisions regarding environment protection is need of the day to bring environmental awareness, environmental education, human rights education, public participation and sensitize the people to preserve ecology and environment.

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## CHAPTER 21

### MISERABLE PLIGHT OF UNTOUCHABLE AND DALIT WOMEN IN MULK RAJ ANAND'S UNTOUCHABLE AND SHIVARAMA KARANTH'S CHOMANA DUDI: A COMPARATIVE VIEW

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#### ABSTRACT:

The present research article is an attempt to make a comparative view of Mulk Raj Anand's *Untouchable* and Shivarama Karanth's *Chomana Dudi* as novels of Social Perspectives which depict the miserable plight of Untouchable and Dalit women. Mulk Raj Anand, a socially committed novelist, has produced a good deal about the miserable plight and social problems of people in his novels. In his first novel *Untouchable*, he depicted the plight of people especially Untouchable and Dalit Women and portrayed their life with social perspectives. It was for the first time in Indian writings in English, barring some exceptions in regional writings, that the marginalized appeared as protagonists in his novels, like Bhaka, Munoo, Gangu and Gauri. On the other hand, *Chomana Dudi (Choma's Drum)* by Kota Shivarama Karanth, gives insight into the marginalized life of people who are socially exploiting in our society. Both Anand and Karanth were contemporary writers and they have portrayed the social evils in their novels. When a writer writes a literary work he wishes to depict the life common people, especially Predicament of Dalit, Miserable plight of Woman, Man-Woman relationship, Tradition and modernity. Every theme makes reader to read their novels again and again. Though we are living in 21<sup>st</sup> century women and Dalit are not free from social injustice and inequality. As 21<sup>st</sup> century re-reading and analysis of the both novels, astonishingly reveals the unrelenting plight of the Dalit and women situation in the present times. The novels describe the sufferings of the protagonists, and record the miseries felt by them. Thus, both these novels have together occupied a special place in Indian literature.

**KEYWORDS:** *Dalit; Women; Oppression; Untouchable; Chomana Dudi; Gender.*

#### INTRODUCTION:

**M**ulk Raj Anand and Shivarama Karantha are very important novelists in India. As Anand claimed fame in writing in English, Shivarama Karanth also got a special respect in Kannada literature. In the novels of both novelists, depiction of Social Perspectives, Humanity, Social injustice, portrayal of Man and Woman relationship, tradition and modernity are the special features. Especially today we must show our concerns on these social evils and their issues. *Chomana Dudi* and *Untouchable* are very important novels and they effectively depict the miserable plight of Untouchable and Dalit Women in our society. When we speak about the social injustice to the

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untouchable and Dalit women both novels sound much. Mulk Raj Anand is perhaps the first Indian novelist in English who gave voice to the voiceless by making the ordinary and unprivileged people heroes of his novels. He was an Indian writer in English, notable for his depiction of the lives of the poorer castes in traditional Indian society. His literary career was launched by a family tragedy, instigated by the rigid caste system that continues to be the scourge of Indian society even today. Anand gained an international following early in his career. We find untouchable latrine sweepers, plantation workers, coolies, farmers, factory workers, oppressed as protagonists in the various novels of Anand like *Untouchable*, *Coolie*, *Two Leaves and a Bud*, *The Village*, *Across the Black Waters*, *The Sword and the Sickle*, *The Big Heart*, *The Old Woman and the Cow* and *The Road*. Thus his art is not for art's sake but it is for life's sake. Anand's place in Indian literature in English is unique and unparalleled. Shivarama Karanth, a kannada writer, novelist, social activist, environmentalist, Yakshagana artist, Film Maker and thinker. Ramachandra Guha called him the "Rabhingranath Tagore of Modern India", who has been one of the finest novelists-activists since independence. He was the third writer to be decorated with the Jnanapith Award for kannada. He is considered one of the most influential novelists in the Kannada language. Karanth made a mark as a novelist even in the thirties of twentieth century with his novel *Chomana Dudi*, which is a starkly moving story of a landless labourer. Decades later it came to national notice as a prize-winning film. He also wrote scores of short stories and plays of daring originality, as well as books of essays, travel, criticism and art history besides encyclopaedias and books of popular science for children and adults. His novels, *Marali Mannige*, *Chomana Dudi*, *Bettada Jeeva*, *Alida Mele*, *Sanyasiya Baduku*, *Mookajjiya Kanasugalu*, *Mai Managala Suliyalli*, *Kudiyara Kusu*, *Sarasamma Samadhi*, *Shaneshwarana Neralalli*, *Kanyabali*, *Hettala Thayi*, *Dharmarayana Samsara* and *Kevala Manushyaru* are widely read and have received critical acclaim.

## MISERABLE PLIGHT OF UNTOUCHABLE AND DALIT WOMEN

### **Untouchable (1935)**

*Untouchable* is Mulk Raj Anand's first major novel and it is published in 1935. The novel's format and story is very simple. It follows the day in the life of an 'untouchable', a member of India's lowest social caste. Despite its simplicity, *Untouchable* is a powerful work that exposed the 'dehumanizing contradictions' and systematic oppressions inherent in India's stratified society. Though intelligent and handsome, the book's main character, Bakha, is an outcast and forbidden from improving his life situation because his touch and presence are considered impure and corrupting. Using Bakha's story as a vehicle, Anand challenges the barriers and rules that inhibit the lives of untouchables and argues for the education of untouchables.

The Problem of untouchability is still prevalent in the society and Mulk Raj Anand through his novel *Untouchable* brings to light the sorrows and sufferings that high caste people inflicted on the untouchables. Mulk Raj Anand's *Untouchable*, is more compact than his other novels. The story is about a low caste family which earns by cleaning latrines. Lakha is the Jamadar of sweepers. He has three children namely Sohini, a young, beautiful girl, Bakha-an eighteen year old boy reluctant to do his father's task, Rakha, the youngest son. The novel centres on a sweeper boy, Bakha. The boy Bakha, the jamadar of sweepers is a child of the twentieth century, and the impact of new influences reverberates within him. Bakha very unwillingly does the work of sweeping and so he looks forward to a change in the lot of sweepers. Showing his sluggishness towards his duty, he is driven out of the house. He then, hears the speech of Mahatma Gandhi. His speech develops in him optimism for societal change in which sweepers would no longer clean the latrines of high castes.

Considered revolutionary because of how it champions the cause of the untouchables and exposes India's social evils, *Untouchable* was well received and highly regarded both domestically and abroad. Within India, it caused a generation of educated Indians to think about how India's internal colonialism was preventing the country's progression to a modern civil society. Outside India, prominent novelists of the age such as E.M. Forster hoisted up Anand's novel as having both historical and literary significance. Though India's caste system is still in place today, books like *Untouchable* raised awareness about the crushing inequalities and injustices the system fosters. This has resulted in the passage of numerous anti-discrimination laws and affirmative action initiatives along caste lines in contemporary India. Furthermore, the appearance of one Mahatma Gandhi in the novel explicitly places the book in a distinctive historical context.

Since the ancient period women have been controlling by the patriarchal conventions. Though in ancient times, as Indian mythology describes, there was a great respect for women, they were in the control of male dominancy. Though the ancient women, as Indian mythology describes, were free to go to the temples, worship and pray to Gods and Goddesses they were not free from the male supremacy. This has been continued to the long period. During the medieval age, which is also called a dark period of history, the condition of women was not improved. But in modern period we can find a slight progress in women's life. In modern period women are getting education and they are started to reach in all the fields which men have acquired. But when we see women in the eyes of social perspectives women are not free from the male supremacy yet. Many writers have shown this and expressed their reformative ideas in their literary works. Especially novelists depicted the horrible situation of women with their effective writings.

Sohini is the heroine of the novel *Untouchable*. She is the daughter of Lakha. She is very beautiful. She is like a rose growing in mire. She has a charming personality. She has a slim and pale brown figure. The rings in her ears and the bangles on her arms have a ravishing effect. Bakha is proud of her beauty. One day when Sohini goes to a well to fetch water, she has to hear abuses as she belongs to the lowest caste. In *Untouchable*, Sohini faces a welter of abuse from Gulabo for no obvious reasons known to her. It is for the novelist to pronounce Gulabo's heartache issuing from the beautiful face and figure of Sohini, who can be her potential rival in future. This novel is a description of the happenings of a single day in the life of Bakha, as also of the women-folk of different castes in his village. Although no female character is allowed to assume central importance in the novel, yet in order to comprehend the writer's manner of sensitivity, and his motivation, it is greatly helpful to look at the novel from the standpoint of female consciousness as represented in it. Sohini becomes much stronger and important. She insulted by the village people and sexually too she was blamed though she has not done any wrong. So Dalit women are doubly exploited, first by their caste and then by their gender. Sohini become the victim to these two.

### **Chomana Dudi (Choma's Drum) (1933)**

One of the classics from the Kannada literature, *Chomana Dudi* (Choma's Drum as translated to English) is one of the major works of Kota Shivarama Karanth, written in 1933. *Chomana Dudi* is a story of an Untouchable, who works very hard as a bonded labour in the field Sankappayya, a local landlord. The main protagonist of the novel 'Choma' is an untouchable. There are few books which completely take the readers into a trance and leave them for several days. *Chomana Dudi* is one of such books with full of emotions and tragic sequences in the entire novel. This is a short novel and it entirely focuses on the untouchability practices. This novel again covers the often discussed and dealt the subject of caste system.

Choma belongs to the Mari caste, a lower class and untouchable, limited to the job of a bonded-labourer of the Village chief. He had five children, Kala, Neela, Guruva, Cheniya and Belli. Widowed, with

five children, to feed, Choma is typical to people of his type, work hard at the fields of his boss, spent half of what he earns at the 'toddy shop' and spent the remaining to his family, which is now put together by the smart hands of the young Belli, a young daughter. She grows to the responsibility of maintaining the house affairs. Choma had a dream of owning or renting his own farm where he wants to cultivate paddy and other crops, for a potential escape from the hand to mouth existence. Two bullocks, which he found abandoned in the forest years ago are now grown and strong, adds to the hopes and dreams of being a farmer himself. There are other suitors for his bullocks, with attractive offers, and threats, but Choma is not willing to let go of them. The orthodox social system prevents Choma from getting his land for him being in the low class. The Christian missionaries offer him support, but he is reluctant to join the pastor's community. Choma also loses his young son, drowned in the river, in front of a watching crowd who refuses to save him for being an untouchable. This shows the cruel mentality of those heartless people.

Choma took debts from the estate lords and was unable to return it. To pay off his debt, Choma had to send his elderly sons to the Coffee Estates in the distant hills. They did not manage to pay off the debt, but one succumbs to cholera and the other desert the community and joins Christianity to marry his lover, leaving his family and the estate. Now the girl, Sohini had to go to the estate and work her way out to pay the debt, which she manages by allowing to be abused by the estate manager and the owner himself. She returns back clearing off the debt, but loosing herself. Choma also loses his young son, drowned in the river, in front of a watching crowd who refuses to save him for being an untouchable. Lost and defeated time and again, Choma find his daughter in a compromising position with the estate manager. He kicks her out of the house, set the bullocks free in the forest; shut himself inside vigorously beats his drums until his life escapes him.

Gender conflict is a major issue in the most of the novels of Shivarama Karanth. His views on women are progressive and revolutionary. Of course, it does not control his fictional writings as a preconceived notion, but evolves as a natural offshoot. The man-woman relationship found in his novels is multifaceted. Karanth is full of admiration for his heroines and female characters that are strong-willed, self-assertive and adventurous. They always face the adverse circumstances with a sustaining boldness and prove themselves to be more sensible than men. In fact, Karanth's treatment of women issues in his novels has given him the name of the first male feminist in Kannada literature.

In *Chomana Dudi* Belli, daughter of Choma, is the Strong and major female character who also exploited by her caste and gender. The main theme of this novel is the Identity of Dalits. Choma, the central character is the father of Belli. He works in the field of Sankappayya, a local landlord. He had a great desire to have a piece of land to cultivate on his own. But his dream never gets fulfilled. Karanth's depiction of man woman relationship and sexual desires of women are highlighted with feminist perspectives. In *Chomana Dudi*, Karanth does not find fault with Belli when she accepts the call of Manvela, and goes with him to fulfil her sexual desires. Her father, because of his poverty, had not been able to get her married. She was sent to the coffee estate to repay her father's debt. She fall a victim to the supervisor's lustful eyes and she could not overcome her bodily desires.

### **A Comparative view**

When we read the novels of Mulk Raj Anand and Shivarama Karanth we can find many similarities with their thoughts and ideas, especially the depiction of Untouchable and Dalit Woman are important view of the both writers. Anand, an Indian writer in English, notable for his depiction of the lives of the poorer castes in traditional Indian society. He, though concentrates on poor and untouchable castes and struggled for their social transformation, also focused his view on the welfare of the women in Indian society. Karanth

also depicts the society and its harsh realities. Both novelists are great in their ideas and perspectives. Critics have considered them as social crusaders for their strong social movements in their literary writings. Both of them have same concerns and views on social evils like Caste system, women exploitation, Religious hypocrisy, Gender discrimination, widow system, life of Untouchables and so on. So we can compare them to get new knowledge and new ideas of culminations.

In the novels, *Untouchable* and *Chomana Dudi*, Anand and Karanth have explained the pathetic condition of an Untouchable family along with Dalit Women. The story of *Untouchable* ends in a single day. Bhaka is the victim of the story. Here the novelist has depicted the characters, Lakha, Bhaka, Rakha and Sohini to explore their miserable plight. Sohini, daughter of Lakha, also becomes the victim in the novel later. *Chomana Dudi* also depicts the story of an untouchable family. Here Choma, the major character becomes the victim. Belli, the daughter of Choma also becomes the victim to the society. Both Sohini and Belli are faced many difficulties in their life both were molested, Sohini is by Pandith Kalinath and Belli is by Manvela. Sohini, when she went to clean the temple, she was molested, but the culprit Pandith Kalinath put all his mistakes on Sohini and people blamed her. Like this, Belli also faced the same. But in *Chomana Dudi*, Karanth does not find fault with Belli when she accepts the call of Manvela, and goes with him to fulfil her sexual desires. Her father, because of his poverty, had not been able to get her married. She was sent to the coffee estate to repay her father's debt. She fall a victim to the supervisor's lustful eyes and she could not overcome her bodily desires. And Lakha, Bhakha and Choma exploited with same manner by the upper caste and social inequality. All these characters are same in their low social status. Thus, both writers have the consciousness of Untouchable and Dalit Women through their powerful writings.

### CONCLUSION:

Mulk Raj Anand and Shivaram Karantha are the great champions of the proletariat, the downtrodden, the destitute and the deprived. They are the crusaders against poverty, slavery and exploitation of human beings, especially Untouchable and Dalit women. The Untouchable are still exploiting in our society. The Dalit women also become the victims of exploitation. Dalit women are quite helpless against the ill-treatment meted out to by the society and the patriarchy. The way of the portrait of major Untouchable and Dalit woman characters have been handled by Anand reveals that there is a gradual and steady growth in the novelist understands of the Social justice and women empowerment. It goes to Karanth's credit that he has made such an outstanding contribution to highlight the Dalit and feminist sensibilities in his novel. He expressed his views which support quality between man and woman. Thus we can find Feminist Perspectives and Portrayal of Female characters in their novels.

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## CHAPTER 22

### GENDER INEQUALITY OF EDUCATION IN INDIAN CONTEXT – A STUDY

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#### **Abstract**

Gender disparity is a worldwide phenomenon and it exists in each country, state, district and even in small villages also. Various researches have already proved that it is seen in every field such as religious, political, social, and biological even in human development indicators such as standard of living, health and education. Gender issue has drawn attention of economists since 1995 when the two new indices of development GDI- Gender Related Development Index and GEM- Gender Empowerment Measure were introduced at international level in UNDP Report 1995. Indian economy, although one in all the quickest growing economy in the world, however still it is so much behind in educational development and gender disparity. India has shown smart progress within the field of education and gender disparity alleviation but still lot more to do yet. Still there is gap in male and female literacy rate. Central government as well state governments are creating serious efforts to fill the gender gap disparity among male and female in education on one hand and implementing various schemes to boost literacy rate especially in female. The present paper proposes to analyze the problem of gender disparity in education.

*Keywords: Gender, Education, Literacy Rate,*

#### **INTRODUCTION**

**H**istorically, the education sector has been classified by the infrastructure, underpaid teaching workers, research work and the motivated student population. In light weight of India's commitment to the Millennium Development Goal of universal primary education, its major challenge is gender inequality and therefore the ensuing money and social group blocks that stop access of women to primary education. In the disparities in education may be discovered through various distributions like caste, religion, sex and money

Gender difference in education could be a persistent downside in Indian society, especially for girls from rural areas and lower socio economic backgrounds. This study considers the gender distinction that exists among every region, socio-economic class and prevents the expansion of Indian economy from raising the lives of Indian individuals. The reality of gender difference in India is extremely advanced and diversified, because it exists in every field like education, employment opportunities, income, health, cultural issues, social issues, economic issues etc. An attempt has been made to find out those factors which are responsible for the problem of gender equality in India. So, this paper highlights the multi-dimensional context of education gender inequalities in India. The researchers have tried to recommend some relevant

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ways and policies implication for reducing this gender difference and to push the dignified position for Indian women`s.

## REVIEW OF LITERATURE

**Thomas, R.E. (2013)**, has highlighted his paper with the state of gender primarily based difference within the trendy Asian country. It has conferred gender difference with the assistance of some facts and figures and representing the difference practiced in Asian country and its comparison with alternative Asian and Western countries.

**Jayachandran, S. (2014)**, has conferred the roots of gender inequality in developing countries. This paper additionally mentioned the many mechanisms through that the economic development may improve the relative outcomes of girls & gender gaps will be reduced as country grows.

## METHODOLOGY

This is descriptive analysis paper supported secondary information. Data are noticed from totally different census report, websites, books, analysis paper and journals collected. The simple graph and tables are used by researcher to explain the facts and finding of the results

## GENDER DISPARITY IN INDIA

India is that the largest democracy within the world with a population of 1.21 billion. India's population increased from 1.028 billion in 2001 to 1.21 billion in 2011, the decadal. Decadal growth rate of population during 2001-2011 was 17.64 percent compared to 21.54 per cent during 1991-2001. The population growth rate has decelerated from 1.97 percent per annum between 1991 and 2001 to 1.64 percent per annum between 2001 and 2011. The deceleration reflects a decline in the Total Fertility Rate, which is estimated to have fallen to 2.6 per cent and is expected to decline to 2.3 per cent within the half of this decade. Fertility levels in the other states are also falling, however still stay a lot of over the replacement level. A significant reality is that for the primary time, the child population in the age group 0-6 years has come down during 2001-2011 due to a declining trend in Total Fertility Rate. India is a vast country comprising 28 States and eight Union Territories with diverse socio cultural contexts and widely varying geographical and climatic conditions. Under a federal structure, the Centre and therefore the States share the responsibilities for the design and implementation of national development programmes. There are a unit well outlined constitutional provisions and mechanisms for sharing of resources and responsibilities between the Centre and therefore the States. The male literacy rates have always higher than female literacy rates at all levels which can be seen in the following table.

### Literacy Rate of Selected Indian States in the year 2001 and 2011

S.No	State	2001	2011
1	Andhra Pradesh	66.64	75.60
2	Assam	63.25	73.18
3	Bihar	47.00	63.82
4	Gujarat	69.14	79.13
5	Haryana	67.91	76.64
6	Karnataka	60.47	67.66
7	Kerala	90.86	93.91
8	Madhya Pradesh	63.74	70.63
9	Maharashtra	76.88	82.91

S.No	State	2001	2011
10	Orissa	63.08	73.45
11	Punjab	69.65	76.68
12	Rajasthan	60.41	67.06
13	Tamil Nadu	73.45	80.55
India		64.83	74.04

Source: Various Census Report

Similarly there is immense gap between male and female in enrolment ratio at various levels in 2011. Thus it is completed that there is a gender disparity in education of India and it is not uniform in all the states of India. Thus it is necessary to resolve the problem of gender disparity and regional variations however before this it is important to quantify gender disparity and measure the severity and extent of the problem of the problem, so that the problem of areas can be identified.

Gender Inequality of Education in India is gender, with males obtaining more access to education than females. Due to partial perceptions, girls are brought up primarily for marriage after which they belong to their in laws. Education is essential for women also and the return on investment on their education is low compare to the education of boy in India and also so many countries. For the low income families, the education of girls is not possible or less possible. As partial views dominate in Indian households girls often do not gain access to educational opportunities and are effectively kept engaged in household. The female literacy rate has been lower than men it had been 53.67 percent against the male literacy rate of 75.26 percent in 2001, and 65.46 percent female literacy rate against the male literacy rate of 82.14 percent in 2011.

The Female and Male literacy rate ratio increased from the 63.83 percent in 2001 to 74.04 percent in 2011 in India. Although the ratio increased in all major states over the years, there were large interstate variations in Kerala compare to other states of India. Kerala had the highest ratio across the years, Bihar had the lowest in 2001 and 2011 followed by Orissa, and Bihar had the lowest ratio followed by Orissa in 2001. However, the states have converged in the Female and Male literacy rate ratio, as the coefficient of variations, measuring the relative dispersion in the Female and Male literacy rate across states, declined over the years. The number of states with Female and Male literacy ratios of 80 percent and above increased from one (Kerala) in 2001 to over the years. The number of states with Female and Male literacy ratios of 80 percent and above increased from one in 2001 to eight out of the fifteen major states in 2011 and the country has been moving toward gender equality in literacy.

#### **SUGGESTIONS:**

India is one of the fastest growing economics in the world today, but it is unfortunate that gender disparity in education still exists in Indian societies. Both the central and state governments are making their best efforts to fill the gender inequality in education of India. The gender disparity is also region specific in order that gender inequality alleviation policies ought to be region specific. There is a solution of every problem. For reducing gender difference in India, we must always provide high level of education girls to increase women direction. We should conjointly offer them chance in active politics and social activities in order that social integration in Indian society are often created. Government ought to build policies concerning stopping the sex identification and abortions.

**CONCLUSION:**

The list of legislations similarly as varieties of discriminations or inequalities might maintain however the important amendment can solely return once the mentality of men can change, when the male species of kinsmen would begin treating women as equal and not subordinate or weaker to them. Let's hope and want that our participative democracy, in times to come, and with the efforts of both women and men.

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## CHAPTER 23

### HUMAN RIGHTS AND EDUCATION IN INDIAN CONTEXT

*Ms. S.Sathya <sup>1</sup>, Dr.P.Mary Thangam <sup>2</sup>*

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#### **Abstract**

The United Nations and its organizations spearheaded the fostering of political, social, and educational rights of human beings in the world community. In so doing, the United Nations challenged communities to transcend differences manifested in gender, race, ethnicity, language, culture, religion, social class, national origin, etc. Prevention Of discrimination, in education, as Well as other spheres has been addressed by more international documents than any other aspect of human rights. Beginning with the United Nations Charter, the UNESCO Constitution and the International Bill Of Rights, the struggle has continued with various declarations, conventions and recommendations. This paper examines the perception and application of the right to education free from discrimination in India. This right is viewed with special reference to education free from religious, racial/ethnic and gender discrimination within the context of the framework of standards set by the UN organizations. The notion of educational rights free from discrimination has been interpreted to mean that all individuals have a natural right to share, on an equal footing and without any discrimination, the educational resources, services and benefits available in their respective societies.

#### **Introduction:**

**T**he United Nations and its organizations spearheaded the fostering of political, social, and educational rights of human beings in the world community. In so doing, the United Nations challenged communities to transcend differences manifested in gender, race, ethnicity, language, culture, religion, social class, national origin, etc. Prevention Of discrimination, in education, as Well as other spheres has been addressed by more international documents than any other aspect of human rights. Beginning with the United Nations Charter, the UNESCO Constitution and the International Bill Of Rights, the struggle has continued with various declarations, conventions and recommendations. This paper examines the perception and application of the right to education free from discrimination in India. This right is viewed with special reference to education free from religious, racial/ethnic and gender discrimination within the context of the framework of standards set by the UN organizations. The notion of educational rights free from discrimination has been interpreted to mean that all individuals have a natural right to share, on an equal footing and without any discrimination, the educational resources, services and benefits available in their respective societies.

The name scheduled caste first came into vogue during British rule with the Government of India Act of 1939 when those castes which suffered great social disabilities due to "untouchability", and had no objection to their name being included, were put on a list or schedule. The Scheduled Castes have suffered

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from socioreligious disabilities associated with the caste system which consisted of a four-fold division of society according to occupations but based on the theory and practice of purity and pollution. The higher castes were associated with purity and the polluted “Untouchables” were at the other end of the scale. Several theories have been advanced on the genesis of the caste system: some emphasize the religious aspect, some describe the functional division of society, others racial factors. Although the category of scheduled castes is based on religion, caste Status is closely associated with occupational status. Ritual status determines caste Status on the basis of purity and pollution as aspects of religious ideology, yet social status differences are derived not from the religious elements but from social stratification of caste. It was inevitable that at independence, the traditionally discriminatory and exploitative power relations had to be changed in terms of human rights. The practice of untouchability is now an offense punishable by law.

### **Objective of the Study:**

For the present study, the researcher has formulated the following objectives.

- To study the human rights and rights to education
- To study the human rights and gender in India.

### **Methodology**

The Study has used secondary data. Secondary data has collected from the Published Books, Journals, Internet Sources and others.

### **Ideological Context**

Human rights in modern India cannot be examined appropriately without taking into account the socio-cultural and religious forces at play. While the influence of Islam has been significant, Hinduism has been the dominant religion, and the traditional Hindu world view has been operative for nearly two millennia. As such, it may be useful to briefly examine the intellectual and social foundations of traditional Hinduism in relation to the ideology of human rights. Hinduism is based on doctrines Such as Maya, Karma and Dharma. 3 It is risky to generalize about such a complex tradition. But for our purposes it should suffice to say that social reality is defined in terms of the concept of Dharma which emphasizes duties rather than rights.

The operational unit in Hindu society has usually been identified as caste. The traditional society was one of rigid hierarchy and extreme inequities in which the collectivity of caste rather than the individual was the salient factor. Rights and duties were defined by membership in a particular kinship group or caste. There was no concept of individual rights. Consciousness of individuality manifested itself only at the spiritual level. The Universal Declaration of Human Rights however is based on an ideology designed to uphold individual rights as well as collective rights. With the process of modernization, which began in India at the Start of the nineteenth century, the lower Segments of the population challenged Hindu orthodoxy and religious conservatism. The emergence of a new middle class started reorganizing society through wealth and educational attainment rather than On the basis of caste. Modern India is based on the ideals of democratic socialism. The demand for independence and the adoption of fundamental rights in the Indian Constitution in 1949 was based on the belief that democracy cannot be established unless certain rights are assured to all citizens.

### **The right to education**

The State is directed to strive for the right to education, make provision for free and compulsory primary education, and promote the educational interests of Scheduled Castes and Tribes, and other weaker

sections (including women). Education is primarily the responsibility of the State Governments, but the Union Government has certain responsibilities specified in the Constitution on matters such as planning, higher education and promotion of education for weaker sections. Most states have enacted legislation for compulsory education. At the end Of the sixth Five Year Plan primary education for ages is free in all states, and for age group 11—14 it is free in all except Orissa, Uttar Pradesh and West Bengal. In these States, girls and members of Scheduled Castes and Tribes get free education, and incentives such as mid-day meals, free books and uniforms, are provided. At the secondary Stage several states have free education for all children and those which do not make free education available to all, do so for girls, Scheduled Castes and Tribes. Thus, free education in all states is provided at the primary and secondary stages for girls, Scheduled Castes and Tribes,

### **Anti-discrimination and equality legislation**

The prohibition of discrimination on grounds of religion, race, caste, sex or place of birth, of the Constitution, implies an education free from discrimination. The Constitution also offers religious and linguistic minorities fundamental rights to conserve their culture, language and script as well as to establish and administer educational institutions of their choice. Groups included are defined more by linguistic boundaries than by ethnicity. Nowhere are ethnic groups mentioned in legislation, although the population is multi-ethnic and multicultural. All the equality clauses forbid discrimination on the basis of language. The government policy is to encourage the use of Hindi as the official language but also the development of all Indian languages, including classical, modern and tribal ones. The National Policy on Education has adopted a three-language formula whereby all children learn the mother-tongue, the regional language and a foreign language which may be English. While there is no explicit policy on multiculturalism, curricula content reflects the multicultural history and nature of Indian society.

### **Gender**

As a percentage of the total population women constitute a larger group than any other minority. In recognition of this, the Constitution has adopted a wide variety of legislative action to counter injustices faced by the majority of women. In terms of the UN Declaration on the Elimination of Discriminator against Women which was ratified by India, the Indian Constitution does very well for women. Compared to the US Bill of Rights and subsequent Constitutional Amendments it has been pointed out that the Indian Constitution affords women "essentially more of, and certainly more explicitly, the rights afforded to men". The National Educational Policy endorses a common curriculum for males and females in the belief that differences exhibited by men and women are the result of social conditioning and unequal social positions accorded to them in society. Although the Constitution states that there shall be no discrimination on grounds of gender, it further provides that nothing shall prevent the State from making any special provision for women and children. The State is permitted to discriminate in favor of women if that is deemed necessary.

### **Conclusion**

In this paper analysis, the ideological context, anti-discrimination clauses regarding religion and gender in India. There is discrimination between people in the field of education in India.

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# CHAPTER 24

## GST IN INDIA

*Dr. Anand A. Muley<sup>1</sup>, Prof. Rupali Petkar<sup>2</sup>*

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### **ABSTRACT:-**

India is a federal country where both the center and the state have been charged with the power to impose taxes and collect them through appropriate legislation. Each level of government has clear responsibilities for performance in accordance with the authority stipulated in the constitution. GST is indirect tax that has replaced many Indian indirect taxes. The Goods and Services Tax Law was passed in Parliament on March 29, 2017. This law entered into force on July 1, 2017. The Goods and Services Tax in India is a comprehensive, multi-stage, destination –based tax that is imposed on every added value. Simply, the GST is an indirect tax which imposed on the supply of goods and services and it's also eliminate all the indirect taxes that previously existed in India. . In this paper author assesses that the importance about GST in India and also aware the requirement to bring this in India.

**KEYWORD:-** *Goods and Service Tax, Structure of GST, Impact and Challenges of GST.*

### **INTRODUCTION:-**

**G**ST is a tax structure which is successfully established in many countries all over the world. It is a part of Indian Economy. It was introduced around 10 years ago but got delayed due to some political issues. But, now GST came into effect at midnight on 1<sup>st</sup> July 2017, by the honorable president of India through the implementation of constitutional amendment. It is considered as the biggest taxation reform in Indian Economy. India is currently the fifth largest economy in the world according to IMF. India is found to be one of the world's fastest growing economies. GST is a value added tax that will replace all other indirect taxes. GST will boost the GDP gradually. It will also increase the level of India in both domestic as well as international market. GST is a single tax which is imposed on the supply of various goods and services.

### ***What is Goods and Service Tax?***

Goods and Service Tax is a tax on goods and services, with comprehensive and continues chain of input credit set-off from Manufacturer to Distributor to retailer till it reaches the end customer. It is essentially a tax only on the value addition at each stage. Through the input tax credit mechanism, a supplier at each stage is permitted to set-off the GST paid on the purchase of goods and services against the GST to be paid on the Supply of goods and services.

The Final consumer will thus pay only the GST Charged by the last dealer in the supply chain, since the set-off benefits can be availed through all the different stages

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**Major Indirect Tax Reform In India**

1. 1974 Report of L.K.Jha Proposed VAT Committee
2. 1986 Entering prohibited VAT called MODVAT
3. 1991 The Chelliah Commission Report Recommends VAT/GST and a recommendation acceptable to the government.
4. 1994 provided by service tax
5. 1999 formation of Tamkeen on state VAT
6. 2000 Implement sales tax on the unified ground and eliminate incentives related to taxes granted by countries.
7. 2003 VAT applied in Haryana in April.
8. 2004 Major progress towards CENVAT
9. 2005-06 VAT applied in 26 other States.
10. 2007 first stuffy and stuffy tax by Mr.
11. 2007 The Minister of Finance announces GST in his budget Speech
12. 2007 CST starts in April
13. 2007 forming the joint working group and presenting the report.
14. 2008 EC finalizes the GST structure in April.

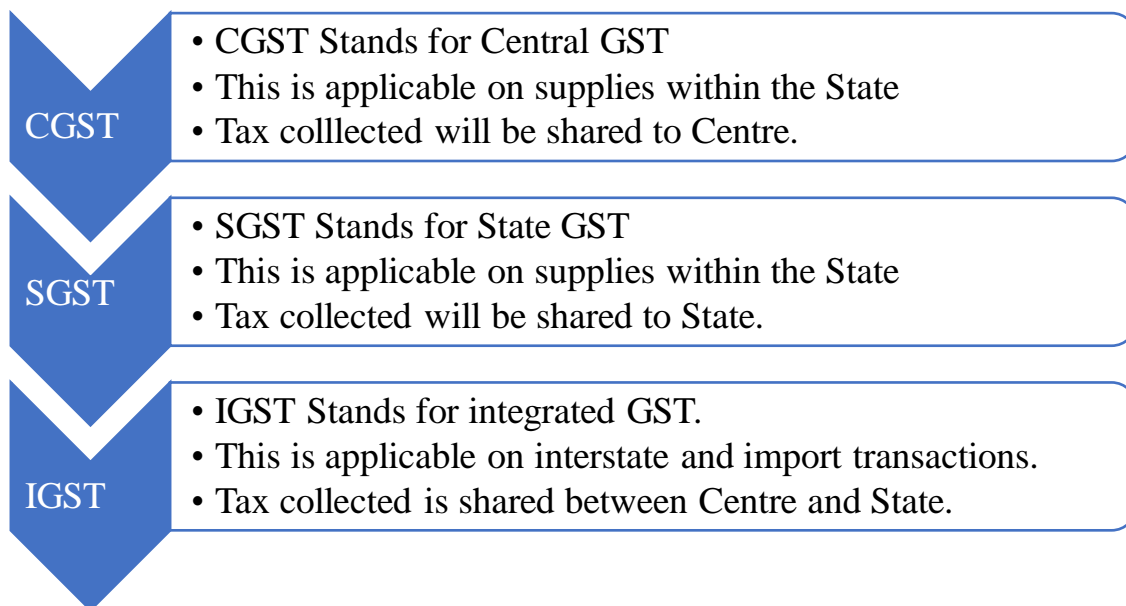
**OBJECTIVES:-**

- To understand the concept of Goods and Service Tax.
- To find out the Impact of Goods and Service Tax on Indian Economy.
- To find out the Benefits of Goods and Service Tax .

**STRUCTURE OF GOODS AND SERVICE TAX:-**

On every supply of goods and services, a tax component of the center and state will be applicable.

*Note:-*



Union territory goods and services tax is levied on the supply of product and services in any of the union territories in the country like Andaman and Nicobar Islands, Daman and Diu, Dadar Nager Haveli, Lakshadweep, and Chandigarh. UTGST is levied along with CGST.

### **IMPACT OF GST ON THE INDIAN ECONOMY :-**

The introduction of the GST would be noteworthy steps in the area of Indirect tax reform in India. By combining a large number of central and state taxes into a one single tax. GST is expected to significantly reduce taxes and make taxes generally easy for industries. India's Nominal GDP growth rate is estimated at 12% in 2019-20 and 2018-19 it was 11.5%. According to data from the RBI India's foreign exchange reserve were US\$ 393.29 billion in the week up to December 21<sup>st</sup>, 2018.

- After the implementation of GST, it's reduce the Number of taxes burden on producer.
- The retail price of the manufactured goods and services in India expose that the total tax component is around 25 to 30% of the cost of the product, after implementation of GST the prices have gone down, as the burden of paying taxes has been reduced to the final consumer of such a goods and services.
- GST is one single tax. It's save money and time.
- GST, provides tax credit to the manufacturer and protect their interest.
- It will add GST to government revenue by expanding the tax base.
- GST will provide credit for taxes paid by producer in the GST. This is expected to encourage producers to purchase raw materials from various registered agents, and it is hoped that it will bring more sellers and suppliers under the tax authority.
- Goods and service tax will cancel customs duties applied to exports. The country's competitiveness.

### ***The impact of GST on various other sectors-***

#### **Export and Import Sector**

Before, the enforcement of Goods and Services Tax (GST), Export and Import were governed by the Service Tax, Value Added Tax, Excise Duty and Customs Duty. These were imposed on the Import and Export of goods and services. When Goods and Services Tax (GST) was introduced all existing taxes were merged into one.

#### **Agricultural Sector**

The impact of GST on the agricultural sector of GST on agriculture is positive. The agricultural sector is a important sector to the overall Indian Gross Domestic Product. It covers almost 16% of the Indian Gross Domestic Product. The introduction of Goods & Services Tax has affected different sectors of the society. One of the important issues looked at by the agricultural sector is the transportation of agricultural items across states all over India.

#### **Textile Sector**

GST has shown a positive effect upon ready-made and textile pieces of garments, as one of the GST beneficial sectors. This new system is profitable to them.

- The Input Tax Credit or ITC framework or chain.
- Input Tax Credit or ITC is currently available on the capital goods.
- The cost for the transporting is currently lower in contrast with the past tax system.

### **IT Sector**

Although the Goods & Services Tax rate for services has increased to 18%, compared with the older system the Information Technology Sector is one of the **GST benefit sectors**. Different factors such as - the accessibility of Input Tax Credit or ITC will cut down the operating expenses and, consequently, expand the Information Technology sector's general productivity.

The main areas of the **GST impact on IT sector** are below:

1. The simpler Tax Rate Administration
2. Removal of Cascading(double tax) Effect of Taxes
3. Business Restructuring
4. E-commerce
5. Opportunities in creating software for GST

### **Banking Sector**

After the introduction of GST, the banking sector has turned out to be more costly. Before, the tax rate of the services for the banking sector was 15%. Even so, after the implementation of GST, the tax rate has been increased on all the banking areas to 18%. These are a few effects of GST on the banking sector:

1. Each separate part of Banks should have separate registration
2. Place of supply identification
3. Reliance upon CGST and SGST
4. The transactions between banks aren't free
5. Input Tax Credit or ITC in GST

### **FMCG Industry**

The FMCG sector is one of the importance sector in Indian economy, this sector is seeing significant saving in the cost of logistics and distribution as GST has eliminated the need for multiple warehouse sales.

### **Challenges of Goods and Service Tax:**

- Goods and Service Tax influencing on prices of goods and services due to subsumed taxes.
- With the help of goods and service tax we can check on the rate of GST and if we find out the rate of GST are over 15% then the goods would be costlier.
- There are still some state in India which lack Information Technology (IT) infrastructure.
- A separate law must be drafted for Goods and Service Tax.
- Transfer the goods and services from one state to other all over the country

### **CONCLUSION:**

The proposed GST system is an discrepant attempt to rationalize the indirect tax structure. More than 150 countries have implemented GST. The government of India must study the GST system established by various countries as well as its implications before it is implemented. In the meantime, the government should make an attempt to isolate India's poor population against potential inflation due to the introduction of the GST. There is no doubt that GST will simplify the current indirect tax system and help to eliminate inefficiencies arising from the current heterogeneous tax system. There are few effects, impact and challenges in the analysis, which are important to highlight.

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## CHAPTER 25

### A STUDY ON THE AFTERMATH OF 2018 KERALA FLOOD ON THE ENTREPRENEURS

*Remya Ann Zachariah<sup>1</sup>, Dr.Raji Mohan<sup>2</sup>*

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#### **Abstract**

An entrepreneur is one who creates a new business, bearing most of the risks and enjoying most of the rewards. Risk taking is almost synonymous with entrepreneurship. Natural disasters, which are beyond the control of man, is one such risk that entrepreneurs face in the smooth functioning of their enterprise. Flood is one such natural disaster that terribly put the entrepreneurs of Kerala in a pathetic situation. Many commercial establishments and retail centers were severely damaged in the 2018 Kerala Flood. Premises, books of accounts, sales, trade, stock and supply of goods were greatly affected by flood. Thus, the unexpected natural disaster remains as an account of, a period of liabilities and losses. Lack of proper and precise warning created time constraints in transferring the assets of business. In order to withstand the huge losses in future, majority of businesses have now insured their business and its premises. The paper throws light on the aftermath of 2018 Kerala Flood on these entrepreneurs with main focus on the entrepreneurs in Aluva area.

*Keywords:* - Kerala Flood, Natural disasters, Entrepreneur

#### **Introduction**

**E**ntrepreneur is a person who sets up business, taking out all the financial risks in the hope of profit. A natural disaster is a major adverse event resulting from the natural processes of the Earth. A natural disaster can cause loss of life or damage property, and typically leaves some economic damages. The severity of it depends upon the affected population's ability to recover and also on the infrastructure available. Natural disasters possess great threat to the entrepreneurs. Whether the disaster is a hurricane, an earthquake, flood or anything else, it can throw a business's carefully laid plans and projections into disarray. Supply chains may be broken, employees might be unable to get to work, and vital facilities or equipment could be damaged. The capital, assets, personnel – everything get shattered. Flood is an overflow of a large amount of water beyond its normal limits. 2018 was an unforgettable and terrible year to Keralites Since 1924 it was the 2018 flood that lashed the shores of Kerala drastically. It caused severe damages to life and property. Business Sector was one of the major sectors that has been worst affected. Many retail centres were completely destroyed. Small commercial establishments – textile business, grocery shops, stationery shops, bakeries, super markets, restaurants – had huge losses. Aluva, formerly Alwaye is a Municipality and town in Kochi which was greatly affected by the dreadful 2018 flood.

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So, this study is an attempt to know the aftermath of 2018 flood that lashed the state of Kerala, on the entrepreneurs of Aluva region.

### Review of Literature

**Monir Zaman** (2012) investigated the impact of floods during 2010 December to 2011 January on small business at Rockhampton in the study, *Impact of recent flood on the economy of small business at Rockhampton*. A survey of 100 small businesses was undertaken to determine the impact of recent flood and the valid response rate of the study was 55%. The main purpose of the study was to find the relationship among location of business, number of employees including the owner, weekly turnover and year of establishment of the business and the impact of recent floods. The results shows that the impact of flood on small businesses was directly related to the location of business, weekly turnover and small business with lower number of employees caused more flood impact on the business. The study also revealed that there exist no correlation between the year of establishment of business and the impact of flood.

**Chandra Sekhar Bahinipati, Umamaheshwaran Rajasekar, Akash Acharya and Mehul Patel** (2015) conducted a study on *Flood induced economic loss and damage to the textile industry in Surat city, India*. Surat is an industrial hub for both the textile and diamond industries. Interviews with workers from 145 textile-weaving businesses were conducted. The study revealed that the mean loss and damage for each sample business unit was approximately INR 1.51 million. It was found that all the sample businesses were severely affected by the flood in 2006 and on an average each unit required 49 days to return to normal. Most of the labourers out-migrated during the post-flood scenario and hence, a shortage of labour was reported as a major issue.

**Zairol Auzzir, Richard Haigh and Dilanthi Amaratunga** (2018) made a study on the *Impact of Disaster to SMEs in Malaysia*. Small and Medium sized Enterprises (SMEs) played an important role in the economy of many countries. In Malaysia, SMEs contributed 32% of country's GDP, employed 59% of the nation's workforce and contributed to 19% of its exports in 2013. It was found that SMEs were exposed to various risks such as natural disasters those may affect their business badly. The study revealed that the impacts of natural disasters were severe for SMEs in Malaysia and flood was identified as the main disasters among them. The study also proposes recommendations for the SMEs to overcome or at least to reduce the impact of natural disaster to their business.

**Heidi Kreibich, Meike Muller, Annegret H Thieken and Bruno Merz** (2007) conducted a study on *Flood precaution of companies and their ability to cope with the flood in August 2002 in Saxony, Germany*. The most affected region of severe flood occurred in August 2002 lashed over the German federal state of Saxony. The damage to companies was high. A survey of 415 companies representing a variety of sectors and sizes were undertaken to identify deficits in the flood management of companies. The precautions and preparedness of companies were low. In addition, about 45% of the companies had not received any warning. Thus many companies were unable to perform emergency measures successfully. The mean total damage to companies amounted to 1.1 million euros. However, because of relatively good flood compensation, recovery advanced quickly.

### Significance of the study

Natural disasters seem to be so destructive that the entire life situations of man tend to be in a state of imbalance. Entrepreneurs are persons who attempts to make profit by starting retail centers in the business world. Natural disasters are unpredictable and create uncontrollable losses to the entrepreneurs. The state of Kerala was hit by a severe attack of Flood in 2018 which had a devastating impact on the entire

state. Commercial establishments were one of the most affected areas. Through this study, an analysis has been made into the financial impact and coping mechanisms followed by the entrepreneurs of Aluva Municipality in connection with the flood of 2018.

### **Scope of the study**

The present study has been undertaken to analyze the aftermath of 2018 Kerala Flood on the entrepreneurs in Aluva, Ernakulam district, Kerala. The geographical scope of the study extends to the areas of Aluva Municipality. The various retail centers around Aluva form the part of the universe.

### **Objectives of the study**

1. To study the financial loss suffered by the entrepreneurs of Aluva.
2. To analyze the measures taken by the entrepreneurs to mitigate the loss.
3. To analyze whether they have taken measures to reduce the after effect of natural disasters like flood in future.
4. To examine the impact on the assets of the business after flood.

### **Research Methodology**

**Selection of Sample:** The respondents of the study consist of various retail centers in Aluva Municipality, which were dreadly affected by the 2018 Kerala Flood.

**Sample Size:** A sample of 60 respondents has been selected for the study.

**Sampling Method:** Simple random sampling method has been adopted for selecting the sample.

### **Data Collection**

The study is designed as a descriptive one and makes use of relevant information and it is collected through both primary and secondary sources. The primary data are collected from entrepreneurs of various retail centers in Aluva Municipality of Ernakulam District through structured questionnaire. Secondary data were collected from journals and websites.

### **Tools for Analysis**

The data were suitably classified and analyzed based on the objective of the study. For analysis, statistical tools like percentages, chi square and likert scale were used.

### **Hypothesis**

- I.  $H_0$ : There is no significant relation between type of business and the time taken for overcoming the loss.  
 $H_1$ : There is significant relation between type of business and the time taken for overcoming the loss.
- II.  $H_0$ : There is no significant relation between type of business and cost of damage.  
 $H_1$ : There is significant relation between type of business and cost of damage.

**Data Analysis**

**Table: 1 PREPARATION MADE JUST BEFORE FLOOD**

Categories	No. of respondents	Percentages
Shift the stock to safer places	8	57%
Move the books of accounts to safer zones	6	43%
Electronic items like computers and other gadgets were replaced	Nil	Nil
Others	Nil	Nil
<b>TOTAL</b>	<b>14</b>	<b>100%</b>

**Source: Primary Data**

Table 1 reveals that only very few respondents (14) could make immediate preparations before flood and among them 57 percent were able to shift the stock to safer places and 43 percent were able to move the book of accounts to safer zones.

**Table: 2 IMPACTS ON ASSETS OF BUSINESS AFFECTED BY FLOOD**

Categories	No. of respondents	Percentage
Fixed Assets	20	33%
Current Assets	13	22%
Both	27	45%
<b>TOTAL</b>	<b>60</b>	<b>100%</b>

**Source: Primary Data**

Table 2 explains that about 45 percent of businesses had greatest impact – loss – on both fixed and current assets of the enterprise. 33 percent had losses on their fixed investments while 22 percent have impact on their current investments.

**Table: 3 STEPS TAKEN TO REDUCE FLOOD IMPACT IN FUTURE**

Likert’s 5 point scale is used in evaluating the statement. Each point on the scale carries a score. The score value for very much affected, affected, neutral, least affected, and not at all affected are 5,4,3,2, and 1 respectively. Likert’s scaling technique, thus assigns a score value to each of the 5 responses. In this way the instrument is a total Score for each response, which would measure the respondent’s favorableness towards the given point of view.

	Not preferred	Least preferred	Neutral	Preferred	Most preferred	Mean Score
Business and its premise fully insured	Nil	2	7	7	44	4.55
Furnishing facilities improved	Nil	2	15	30	13	3.9
Upper buildings were constructed to keep the stock and shift the stock at times of emergency	1	13	23	10	13	3.35
Business records fully computerized	4	13	28	9	6	3

**Source: Primary Data**

Steps taken to reduce flood impact in future can be analysed by using scaling method as:

- 0-1: Not preferred
- 1-2: Least preferred
- 2-3: Neutral
- 3-4: Preferred
- 4-5: Most preferred

As per the analysis, the most preferred step to reduce the flood impact in future is to insure the business and its premises. Improving the furnishing facilities, construction of upper buildings to keep the stock and fully computerizing the business records were found to be the preferred step.

With a view to find whether there is any association between type of business and the time taken for overcoming losses , the following hypothesis is framed :-

H<sub>0</sub>: There is no relation between type of business and the time taken for overcoming the loss.

H<sub>1</sub>: There is relation between type of business and the time taken for overcoming the loss.

To test this hypothesis, chi square test is applied.

**Table: 4 TYPES OF BUSINESS AND RECOVERY PERIOD**

Type of business	Recovery Period			Total
	One month	Two months	More than two months	
Textile	Nil	2	4	6
Restaurant	Nil	5	12	17
Stationery	Nil	2	2	4
Others	Nil	13	20	33
Total	0	22	38	60

**Source: Primary Data**

Chi square test can be done only after pooling those values which are less than 5 in the above table.

Calculation using chi square test

**Table: 4.4.1**

O	E	(O – E) <sup>2</sup>	(O-E) <sup>2</sup> /E
7	8.43	2.0499	0.242
15	13.56	2.0736	0.152
16	14.56	2.0736	0.142
22	23.43	2.0449	0.087
Total			0.623

“O” indicates Observed frequency given in the contingency table.

“E” indicated Expected value = (row total \* column total)/ grand total

$$\chi^2 = \Sigma (O-E)^2 / E = 0.623$$

Level of significance = 0.05

Degree of freedom = (r-1) (c-1)

$$= (4-1) (3-1)$$

$$= 3*2 = 6$$

Table Value = 12.592

The calculated value of chi-square is 0.623 and table value at 5% level of significance is 12.592. Since the computed value (0.623) is less than the table value (12.592), the **null hypothesis is accepted**. This infers that there is no significant relationship between type of business and the time taken for overcoming the loss.

With a view to find whether there is any association between type of business and cost of damage, the following hypothesis is framed:-

H<sub>0</sub>: There is no significant relation between type of business and cost of damage.

H<sub>1</sub>: There is significant relation between type of business and cost of damage.

**Table: 5 TYPE OF BUSINESS AND COST OF DAMAGE**

Type of Business	Cost of damage				Total
	Up to Rs 1,00,000/-	1,00,000/- plus	Up to Rs 5,00,000/-	5,00,000/- plus	
Textiles	Nil	Nil	1	5	6
Restaurant	6	2	3	6	17
Stationery	Nil	2	1	1	4
Others	4	4	9	16	33
Total	10	8	14	28	60

**Source: Primary Data**

Chi square test can be done only after pooling those values which are less than 5 in the above table.

Calculation using Chi Square test

**Table: 5.1**

O	E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
10	8.33	2.7889	0.334
8	7.2	0.64	0.088
5	6.3	1.69	0.268
9	7.7	1.69	0.219
12	12.6	0.36	0.028
16	15.4	0.36	0.023
Total			0.96

“O” indicates Observed frequency given in the contingency table.

“E” indicates Expected value = (row total \* column total) / grand total

$$\chi^2 = \Sigma (O-E)^2 / E = 0.96$$

Level of Significance = 0.05

Degree of Freedom = (r-1) (c-1)

$$= (4-1) (4-1)$$

$$= 3*3$$

= 9

Table value = 16.919

The calculated value of chi-square is 0.96 and table value at 5% level of significance is 16.919. Since the computed value (0.96) is less than the table value (16.919), the **null hypothesis is accepted**. This infers that there is no significant relationship between type of business and the cost of damage incurred in flood.

By using Chi Square test, it is thus concluded that there is no significant relationship between type of business and recovery period. It is also found that no significant relationship exist between type of business and cost of damage.

### **Findings and Conclusion**

- 1) The study reveals that majority got flood alert and flood warning before the flood. But duration before the flood was too short for them to take any preparations.
- 2) It was found that most of the respondents could not make immediate preparations before the flood occurred. It was also due to the late flood alert received to the entrepreneurs.
- 3) Only few respondents were able to make preparations before flood and among them few could shift the stock to safer zones.
- 4) It was found that if entrepreneurs were given proper warnings before flood they could have initially replace their electronic gadgets.
- 5) Most of the respondents did not expect that their business get affected.
- 6) The respondents agree to the fact that they suffered huge loss due to the location of business.
- 7) The impact of flood was such that they could not make a proper distinction between fixed and current assets as both were equally affected.
- 8) Time constraint was found to be the main factor for the kind of impact they had on the business due to flood.
- 9) Supplies of goods were found to be the most affected area due to flood.
- 10) Majority of entrepreneurs have investments in the range of 5 lakhs to 10 lakhs.
- 11) Cost of damage exceeded 5, 00,000 rupees for majority of the entrepreneurs.
- 12) Majority of the respondents had partly insured their business before the flood.
- 13) Entrepreneurs used insurance claim to mitigate their loss.
- 14) The study found that it took more than two months to recover the flood loss.
- 15) Entrepreneurs are planning to take full coverage of business so that in future their business will not be so much affected.
- 16) It is identified that there is no significant relation between type of business and time taken to overcome the losses. That means the period taken to cover the losses does not depend upon the type of business they dealt with.
- 17) It is further identified that there exist no significant relation between type of business and cost of damage. That means the amount lost or the cost of losses is not depended on the type of business they dealt with.

### **Conclusion**

Flood that lashed Kerala in 2018 was a great event of huge losses and damages to the business sector. The unexpected natural disaster remains an account of, a period of liabilities and losses. From the study it

was concluded that none of the respondents expected such a great threat to their business sector. They were not able to make adequate measures before the flood. Both fixed and current assets of the business were affected by the flood. The time constraints in transferring assets are the major reason for such great impact on the assets of the business. Premises, books of accounts, sales, trade, stock and supply of goods were greatly affected by flood. In order to withstand the huge losses in future, majority of the businesses have insured their business and its premises, so that they will be able to overcome the unexpected events like this. The entrepreneurs are positive about the future. Now they are better equipped to handle such disaster.

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# CHAPTER 26

## DYNAMICS OF BUSINESS INCUBATION PERFORMANCE

***S.C. Vetrivel<sup>1</sup>, V. Krishnamoorthy<sup>2</sup>, M. Mohanasundari<sup>3</sup>***

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### **Abstract:**

Business incubator programs, often called new entrepreneur creation projects help develop new entrepreneurs and support them to start up business and be better able to survive on a longer-term sustainable basis. The business incubator target group includes small entrepreneurs that want to grow, new graduates and those who would like to develop their talent and ideas and commercialize them. Business incubation performance is measured in terms of incubatee growth and financial performance provide indicators of success. This paper discusses the various factors like how business incubators and the process of business incubation increase the likelihood that new ventures will survive the early stages of development. It conceptualizes the incubator as an entrepreneurial firm that sources and manages the innovation process within emerging organizations, infusing these organizations with resources at various developmental stage-gates while containing the cost of their potential failure. The incubation process and specification of the range of possible incubation outcomes offer implications for managerial practice and policy-making vis-à-vis incubator management and good entrepreneurial failure.

***Keywords:*** *Business performance, entrepreneurship, business incubator, business development, incubation process*

### **1. Introduction**

All Incubation begins as creative solutions. If a creative solution has broad use, it may be referred to as an innovative solution or an innovation. It is a new idea, device or process and accomplished through more effective products, processes, services, technologies, or ideas in management and Technology. Incubation is an understanding and simulating the existing or new systems and process or certain aspects of it, such as the startup the system, Corporate Venturing, innovation in policy of Management Technology. It creates strategy and simulating the games in which the players have to start their own Startup, be an Innovation Manager, Analyst, Programmer or creator in the corporate world. Global Corporate Strategy is covering corporate strategies to enable an organisation to achieve its objective of international expansion. It is useful to distinguish between three forms of international expansion depends on company's resources, capabilities and current international position. In practice, the business case for a global strategy will vary with the product category. In today's world of cut throat

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competition, every step ahead in the business world is a challenge and competitive. The melting of barriers among nations and their increasing interconnectedness, accelerated by modern management thoughts and technology, has led to a change in the world order leading to a profound impact on global business. The real issue for many Business corporations is what decisions are treated globally and it is required to explore various strategies to face the challenges to advance the development of new Management Practices.

The failure of new ventures in their early stages of development is a common occurrence (Watson et al., 1998; Zacharakis et al., 1999). Business incubation is a business support process that accelerates the successful development of start-up and fledgling companies by providing entrepreneurs with an array of targeted resources and services.

There are five different mutually exclusive incubatee outcome states at the completion of the incubation process:

1. The incubatee is surviving and growing profitably.
2. The incubatee is surviving and growing and is on a path toward profitability.
3. The incubatee is surviving but is not growing and is not profitable or is only marginally profitable.
4. Incubatee operations were terminated while still in the incubator, but losses were minimized.
5. Incubatee operations were terminated while still in the incubator, and the losses were large.

The literature has suggested that the first three outcome states are indicative of incubation success and the last two outcome states are indicative of failure (Hackett and Dilts, 2004).

#### **Business incubators and the business incubation process:**

An incubator is the operationalization of a community strategy to promote the survival of new firms, an incubator is an enabling technology, rather than a critical or a strategic technology. This categorical distinction is not trivial: The underlying value of an enabling technology is a function of the critical and strategic technologies it enables. The mere existence of an enabling technology such as a business incubator does not, in and of itself, necessarily translate into the development of critical and strategic technologies embedded in the products and/or services of innovative new firms; a lack of inputs such as capable entrepreneurs and/or critical or strategic technologies for commercialization might go a long way toward explaining why many incubators perform so poorly.

The need for business incubation is one of the outcomes of Union government policies to promote of the small and medium enterprise support structure in the country. The purpose aimed at the identification of gaps in SME support activities that need to be addressed for the SMEs to increase their contribution to the economy. These gaps included: a need for increased innovative approaches to SME finance, better linkages between the academic community and industry, better and quicker commercialization of innovation including the process for business incubation.

Bhabra-Remedios and Cornelius (2003) noted that economic agenda of sponsors has mostly been used as a measure of incubator evaluation and consequently theoretical considerations of research have remained limited to economic and financial models of incubator performance. They proposed that performance of new ventures, entering into, and graduating from that incubator, must also be tracked so that a comprehensive performance evaluation model be developed.

#### **Effectiveness of incubation:**

In broader sense, the term effectiveness of incubator connotes all the benefits and satisfaction, which stake holders derive across the value chain, in relation to the resource incurred (Lalkaka, 2000). A

typical incubator may involve large number of stake holders, including state authorities, local community, related universities, new start-ups, chambers and business associations, business development services provides, and donor/Int'l business development agencies. This diversity brings interests and compound inputs (resources for our purpose) to incubator and is fundamental feature of incubator-Incubation process. Access to multiple resources like easy approach to government departments, collaboration with universities, networking with industry and other incubators, provision of subsidized legal and other business development services etc. put forward a decisive part in winning performance of incubators (Peters et al., 2004). Involvement of different stakeholders is therefore imperative for incubators. Given that all stakeholders have their own objectives and agendas behind lending support to incubator, effectiveness of incubator relates to the fulfillment of the respective objectives for each stake holder. Since different stakeholders have varied interests and objectives, it becomes a daunting task to develop a laid down criteria of measuring the success of incubators. Initial studies on incubators by Campbell and Allen (1987) and Allen and Weinberg (1988) concentrated on two indicators-rate of success of incubated businesses and new jobs created by them-for evaluation purposes. Barse (1998) maintained that goals and objectives of incubators are valid and henceforth frequently used standards to gauge effectiveness. However, he also noted that this approach has limited researchers and sponsors to set benchmark for cross comparison of different type of incubators.

Impact of business environment also became a consideration in incubator evaluation when Autio and Klofsten (1998) suggested that degree of fit between the needs of local market and services being offered by incubator is another applicable indicator of performance. Bhabra-Remedios and Cornelius (2003) noted that economic agenda of sponsors has mostly been used as a measure of incubator evaluation and consequently theoretical considerations of research have remained limited to economic and financial models of incubator performance. They proposed that performance of new ventures, entering into, and graduating from that incubator, must also be tracked so that a comprehensive performance evaluation model be developed.

Interestingly, a contradictory conclusion was made by Hackett and Dilts (2004b), who in purview of their systematic review of incubation research, concluded that incubation effectiveness studies have already been concentrated on incubatee success as a benchmark. Furthermore, drawing on option driven theory (Hackett and Dilts, 2004a) , they proposed that in addition to the survival rate of incubatees, incubation effectiveness criteria should also include the ease and cost effective exist for those entrepreneurs who tend to close business.

Five general categories namely infrastructural facilities (i.e. office, location, equipment etc.), marketing services (i.e. exploring markets, exhibitions etc.), training programs (i.e. marketing, management, business development skills), networking (i.e. chambers, associations etc.), and consultancy services (i.e. project development, legal/financial/technical services etc.) were the key factors for the effectiveness of business incubation according to Khuram Shahzad (2012).Among the five general categories of facilities and services, marketing related services such as participation in exhibitions/business fairs, and identification of new market opportunities are viewed as the most important services provided by the incubator. Whereas infrastructural related facilities such as affordable office space, shared facilities, and office equipment are rated relatively as least important by the tenants in terms of their importance.

Sean M Hackett and David Dilts (2004) employed options theoretic reasoning to build a theory of business incubation, motivating propositions along the way. Which are

1. The options lens is the most appropriate theoretical approach for developing a theory of business incubation that predicts and explains business incubation outcomes.

2. Business incubation performance is positively related to selection performance.
3. Business incubation performance is positively related to intensity of monitoring and business assistance efforts.
4. Business incubation performance is positively related to resource munificence.

The incubation process and specification of the range of possible incubation outcomes offer several implications for managerial practice and policy-making vis-a`-vis incubator management and good entrepreneurial failure. First, incubator managers can use the model to develop inspection points and then audit their incubation processes. Second, with a real options perspective, a positive view of incubatees that fail quickly and cheaply can be adopted. The relevance of this approach vis-a`-vis incubator managerial practice and policy-making should not be understated: Incubators that help their incubatees fail quickly and cheaply are successful incubators because quick and cheap failures provide opportunities for entrepreneurial learning, firm recovery and repositioning (or later firm “reincarnation” in the event of terminal firm failure), an optimal allocation of incubator and incubatee owner resources, and an optimal injection of organizational population churn into the local economy.

### Conclusions

The role of incubation in the development and sustainable growth of small and medium businesses is vital. Business incubators are confirmed in the literature on innovation and in practice in more successful economies as one of the important instruments to develop effective employment and sustainable new start-ups to support knowledge based enterprise development. Government can develop a strategy for an open public private sector debate on the importance of the business incubation process for enterprise creation and development of SME sector countrywide. To support this, visits could be arranged to some business incubators in the benchmarked locations in the country to become familiarized with existing experiences. To the extent possible this should be done jointly with public and private sector institutions such as universities and industry consortia and associations.

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## CHAPTER 27

### ROLE OF AGRICULTURAL CO-OPERATIVES IN COMMUNITY DEVELOPMENT AND SOCIAL REINFORCEMENT

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#### **Abstract**

Co-operative is a unique form of business used by people and businesses for their mutual benefit. The contributions of cooperative is invaluable to poverty reduction, employment generation and social integration. Cooperatives are community-based, rooted in democracy, flexible, and have participatory involvement, which makes them well suited for economic development. An economy based is one form of business organization alone is neither desirable nor possible in modern times. To justify their existence and fulfil their purpose, cooperatives must make a significant and unique contribution to solving some of the massive problems facing mankind today. This paper examines the role of cooperative societies in economic development. The aim is to investigate the ways in which cooperatives can act as agents towards sustainable community development. This paper observes the part of cooperative societies in economic development. The aim is to explore the ways in which cooperatives can act as managers towards sustainable community development. It describes the role of cooperative societies in economic development. The paper posits that for over 160 years now cooperatives have been an effective way for people to exert control over their economic livelihoods as they play an increasingly important role in facilitating job creation, economic growth and social development. It summarizes that to be effective and successful; cooperatives must continuously achieve two inter-related goals: enhance viability and improve ability to service its members, society at large and remain an economically viable, innovative and competitive enterprise.

*Key words: Co-operative, Development, Society, Constrains, Constitution, sustainable*

#### **Introduction:**

**T**he Cooperative Societies can be defined as ‘an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise’. India is an agricultural country and laid the foundation of World’s biggest cooperative movement in the world. The need for profitability is balanced by the needs of the members and the wider interest of the community, the Cooperative Movement was started by the weaker sections of society for protecting its members from the

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clutches of profit hungry businessmen. Here, we are giving a brief summary of the Cooperative Movement and Cooperative Societies in India for general awareness.

### **Cooperative Movements in India**

In 1984, Parliament of India enacted the Multi-State Cooperative Societies Act to remove the plethora of different laws governing the same types of societies. The most important success stories lay behind the success of White Revolution which made the country the world's largest producer of milk and milk products; and Green Revolution and the conversion of villages into model villages have assumed great importance in the wake of the Green Revolution.

Government of India announced a National Policy on Co-operatives in 2002. The ultimate objective of the National Policy was to-

- (a) Provide support for promotion and development of co-operatives
- (b) Reduction of regional imbalances
- (c) Strengthening of cooperative education, training and human resource development

### **Review of literature**

For over 160 years now, cooperatives have been an effective way for people to exert control over their economic livelihoods (Agarwal, R., & Gort, M. 1996). According to Agbo, F. U. (2000) combating exploitation, reducing disparities, improving social conditions and gender sensitivity, and helping to create a more just society with pronounced concern for environmental protection and sustainable processes of development all tend to make a cooperative a preferred and more socially desirable form of organization. Bottomley T. (1989) stated that cooperatives are specifically seen as significant tools for the creation of decent jobs and for the mobilization of resources for income generation. Even though co-operatives appeared in the century previous, Rochdale is seen as the first 'modern' cooperative since it was where the co-operative principles were developed (Gibson, 2005; and Abell, 2004). (Hussi, P., & Murphy, J. 1993) examines the difference between cooperatives and other businesses in relation to three main groups of people responsible for bringing them into existence and keeping them in operation. The three groups are: the persons who own them (the shareholders, the investors), the persons who control them (the effective decision makers) and the persons who use them (the customers). Cooperatives are community-based, rooted in democracy, flexible, and have participatory involvement, which makes them well suited for economic development

### **Agro-Based Industries in India**

#### **Importance of Cooperative sector for India**

The Cooperatives play very important role in India, because it is an organization for the poor, illiterate and unskilled people. The importance of Cooperative sector for India is given below:

1. It provides agricultural credits and funds where state and private sectors have not been able to do very much.
2. It provides strategic inputs for the agricultural-sector; consumer societies meet their consumption requirements at concessional rates.

Co-operatives come in all shapes and sizes and all sectors of the economy. Snake catchers in India, prisoners in Ethiopia and taxi drivers in Rwanda are some diverse examples of co-operatives, and 75% of Fair trade products are from farmers' co-operatives. Co-operatives can and do make major contributions to

millennium development goals. They can generate income for their members and also offer a range of benefits depending on why they are set up. In meeting their members needs co-operatives enhance incomes and secure livelihoods for their members and their communities. Co-operatives cannot provide the whole answer to global poverty and economic injustice, but they are certainly part of the answer, as they are part of a movement sharing a set of global values and principles. By their very nature cooperatives play the following roles:

- As economic actors they create opportunities for jobs, livelihoods and income;
- As social organizations built on a common goal and a common bond they extend protection and security, and contribute to equality and social justice;
- As democratically controlled associations of individuals they play a constructive role in communities and nations, in society and politics. These three roles cannot be dissociated one from another because they are inherent to the very nature of cooperatives.

The primary role of co-operatives is to meet their members' needs. Too often, they have been viewed as instruments for the delivery of the goals set by external agencies, such as governments and NGOs, and criticized for not reaching the poorest. It is vital that there is respect for a co-operatives institutional integrity with their distinctive model of governance and enterprise, and their enshrined values and principles.

#### **Community Development Approaches:**

New Community Development approaches in the narrowest sense, community development involves increasing the number or quality of jobs so that individual and aggregate income expands. In recent years it has become common to use an expanded definition of economic development that includes various quality of life measures of residents over time. The use of a broader economic development definition has led to a shift in development strategies. As the negative consequences of some industrial recruitment cases have become clear, communities have begun to reconsider their economic growth programs. While most cities and counties continue to recruit firms from outside their trade regions, they are also increasingly prone to implement a business retention and expansion program and a systematic effort to stimulate the formation of new, locally based entrepreneurial firms.

Agricultural and rural utility cooperatives are common in many rural areas in the India, proving the success of the cooperative model in this setting. Housing, consumer, and other service co-ops, are also prevailing in the country. Although farmers will often look to the cooperative as a model for new business ventures related to the farm, they and other rural residents too often ignore it for nonfarm business opportunities.

#### **Strengths of the Cooperative Model**

##### **Community Interest:**

From a local development perspective, a critical feature of the cooperative model is that it can be owned and controlled by community residents. Therefore, a cooperative is more likely to be interested in promoting community growth than an investor-owned firm controlled by non-local investors. Since community residents control the firm they can ensure their own objectives are met, and not those of people who live elsewhere.

##### **Flexible Profit Objectives:**

Cooperatives do not have to be concerned about generating high profit values for stockholders. Their objectives are set by their members and often focus on providing services rather than on maximizing

overall profit for the business. Many non-agricultural cooperatives, for example, are created to serve a local need, not to generate profits. Invest or owned firms can be under considerable pressure to grow as fast as possible, often outgrowing their community and relocating to a location where the supply of labor is larger and other inputs can be more easily obtained.

**Financial Advantages:**

Cooperatives are eligible to apply for loans and grants from a number of central and state agencies designed to support cooperative development. These can provide significant sources of low cost start-up and operational funds for the cooperative business. In addition, other non-governmental financial intermediaries such as co-op banks provide relatively low cost loans to cooperatives. Cooperatives can also benefit from significant tax advantages. Further, cooperatives may also be able to take advantage of lower labor costs, as members may be willing to contribute labor instead of capital as a form of investment in their business.

**Back ground on Cooperatives:**

Cooperative principles on the other hand, are guidelines by which cooperatives put their values into practice. The principles rest on a distinct philosophy and view of society that helps members judge their accomplishments and make decisions (Hoyt, 1996). Before 1995, the ICA has made two formal statements of the cooperative principles, in 1937 and 1966. In 1995, the ICA redefines, restates and expands the cooperative principles from six to seven in order to guide cooperative organizations at the beginning of the 21st century.

The principles are: Voluntary and Open Membership; Democratic Member Control; Member Economic Participation; Autonomy and Independence; Education, Training and Information; Cooperation among Cooperatives; and Concern for Community. The import of the above principles is that cooperatives are voluntary organisations, open to all persons able to use their services and willing to accept the responsibilities of membership, without gender, social, racial, political or religious discrimination.

They are democratic organizations controlled by their members, who actively participate in setting their policies and making decisions. Men and women serving as elected representatives are accountable to the membership. Members contribute equitably to, and democratically control, the capital of their cooperative. At least part of that capital is usually the common property of the cooperative. Members usually receive limited compensation, if any, on capital subscribed as a condition of membership.

Members allocate surpluses for any or all of the following purposes: developing their cooperative, possibly by setting up reserves, part of which at least would be indivisible; benefiting members in proportion to their transactions with the cooperative; and supporting other activities approved by the membership. Also, cooperatives are autonomous, self- help organisations controlled by their members. If they enter into agreements with other organisations, including governments, or raise capital from external sources, they do so on terms that ensure democratic control by their members and maintain their cooperative autonomy. They provide education and training for their members, elected representatives, managers, and employees so they can contribute effectively to the development of their cooperatives. They inform the general public - particularly young people and opinion leaders - about the nature and benefits of cooperation. They also serve their members most effectively and strengthen the cooperative movement by working together through local, national, regional and international structures.

Further, cooperatives work for the sustainable development of their communities through policies approved by their members. Regardless of the type, size, geographical location or purpose, cooperatives

provide a unique tool for achieving one or more economic goals in an increasingly competitive global economy.

These goals include achieving economy of size, improving bargaining power when dealing with other businesses, purchasing in bulk to achieve lower prices, obtaining products or services otherwise unavailable, obtaining market access or broadening market opportunities, improving product or service quality, securing credit from financial institutions and increasing income (RBCDS, 1995). Cooperatives operate very much like other businesses. They must serve a market efficiently and effectively, they must be well managed, and they must survive financially. However, there are important distinctions that make cooperatives unique.

Laidlaw (1974) examines the difference between cooperatives and other businesses in relation to three main groups of people responsible for bringing them into existence and keeping them in operation. The three groups are: the persons who own them (the shareholders, the investors), the persons who control them (the effective decision makers) and the persons who use them (the customers).

According to him, in typical capitalist business, especially large enterprise and multinational corporations, these three are separate and distinct groups. In small private business the situation is generally much better because of the close connection between shareholders (investors) and control. In a small retail business, for example, the first two components are often identical. But still the users, the customers, are a separate group. In a cooperative, all three come together to form a unity; those who own, those who control, and those who use are one.

The points of comparison apply also to public enterprise and cooperatives, though in a different way. In public enterprise, the components of ownership, control and use are separate and disjointed, in contrast to cooperatives, where they are unified. In cooperatives, responsibility and accountability are direct; in public enterprise they are indirect and frequently difficult to trace.

### **Gender equality:**

Cooperatives are contributing towards gender equality, by expanding women's opportunities to participate in local economies and societies in many parts of the world.

### **Challenges of Cooperative Societies**

Cooperatives the world over are in a state of flux. In almost all parts of the world, cooperatives face one or more of the following crises: crisis of ideology, crisis of capital, crisis of credibility and crisis of management (Taimni, 1997). Cheney (1995) identified five challenges facing cooperatives. These are cultural transformation, competition and expansion, wage solidarity, centralization and reorganization, and programmes to increase productivity and participation. Groves (1985) on the other hand, posits that one of the major problems of cooperatives is how to keep balance in the two parts of cooperative business, efficiency and democracy since those who are charged with the operation of a cooperative chiefly the board and manager must serve two masters: the imperatives of good business practice and the social purpose of a community of people. Hence, to maintain their special character, cooperatives must be two things in one: a business organization and a social movement. This is what makes a cooperative a business enterprise with a human face and so, very difficult to manage. In striving for efficiency, cooperatives often tend to imitate other business, but in pursuing a social purpose they bring out the features, which make them different (Laidlaw, 1974).

Educating, training and retraining of members in general and officers in particular is always a challenge to cooperatives especially in developing countries. A cooperative without a strong component of

education is in danger of losing its essential character, that is, the human and personal characteristics which distinguish it as a cooperative. Education is of paramount importance to the cooperative sector. Unless all those responsible for cooperatives (directors, officers, members, staff) are well informed and knowledgeable, cooperatives are likely, in some countries, to become much like capitalist, profit-seeking business, or in other countries to become handmaids of the State. Education makes people easy to lead, but difficult to drive; easy to govern but impossible to enslave.

Assuming the validity of the sector concept (the "mixed economy", as it is often called), cooperators face such questions as what type of business activity is most suitable for each of the three sectors, public, private and cooperative? Are there certain kinds of business that rightfully belong to the public sector? Are there others, which are best left to private enterprise? What kinds, ideally, are most suitable for the cooperative way of business? Are there some fields in which all three may engage and compete? Hence, one other challenge that cooperative societies face is the choice of business most suitable for the enterprise.

Another challenge facing cooperatives is adaptation. No business in a national economic system is completely independent and self-sufficient but operates in conditions of dependence and interdependence. Both capitalist business and cooperatives depend to some extent on the State and services provided by the State (highways, water supply, the postal system, etc.). Similarly the State and public enterprise depend greatly on private enterprise, or on cooperatives. Sometimes private-profit business depends on cooperatives. And, of course, the reverse, cooperatives depending on private business in some way or other, is quite common. Thus, cooperatives cannot be thought of as an exclusive economic system but rather as one section of the total economy. They constantly operate in co-existence with other forms of business and sometimes in conjunction with them. Co-operatives therefore, have to adapt themselves by struggle in one place, by agreement in another - to the elements of a complex environment, partly free and partly organized. It must now decide what place it means to claim for itself in the new economy, either organized or in process of organization.

The different needs of customers, members, patrons, and owners challenges the cooperative's board of directors and manager to make good business decisions. Business earnings of the cooperative must be great enough to systematically rotate the investment of members, pay patronage, and offer goods and services at reasonable prices or pay fair market value for customer's products. This unique business structure dictates that the manager, board of directors, and members understand the business and cooperative structure.

To better tackle the above problems, Taimni (1997) suggested, in addition to fore mentioned, that cooperatives should make optimum use of all resources and strive continuously to enhance productivity of resources; ensure highest efficiency while providing services to members; improve management capabilities and competencies through effective organizational designs and structures; mobilize capital and lay greater stress on internal capital formation and accumulation; develop and retain human resources - members, leaders, staff and managers; forge strategic alliance with key institutional actors in the new environments; evolve and sustain integrated, vertical structures; increasingly focus on directly enhancing socio-economic conditions of their members by undertaking value-added operations; encourage members' participation through improved, diversified services; and strictly adhere to the values of honesty, openness, caring and concern for community and environments.

## **Conclusion**

A cooperative is a unique form of business used by people and businesses for their mutual benefit. Regardless of its purpose or membership, starting a cooperative requires considerable time, energy,

commitment, and technical resources. Recognition of a common need is fundamental to the formation and successful operation of a cooperative. Potential members must devote much time and energy to developing their new business. A cooperative requires member commitment to finance and use the business and select knowledgeable directors who hire a competent manager. A strategic business plan is important to harmonize all of the elements for the cooperative's success.

In order to achieve their maximum strength and effectiveness, cooperatives of various kinds must regard themselves and, as far as possible, act as a distinct sector within the national economy of any country. As business organizations, cooperatives are partly private, partly public, but essentially different from both private enterprise and public enterprise. They are a "middle way", an economic sector in their own right.

Cooperatives must play the role of a Third Force, an alternative and countervailing power to both Big Business and Big Government. A cooperative is a business enterprise in which the elements of ownership, control and use of service are united in one group of persons. The distinguishing feature of cooperative business is its dual nature as economic enterprise and social organization.

An economy based on one form of business organization alone is neither desirable nor possible in modern times. The best economic order is achieved through a mixed economy. To justify their existence and fulfill their purpose, cooperatives must make a significant and unique contribution to solving some of the massive problems facing mankind today.

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## CHAPTER 28

# POLITICAL EMPOWERMENT AND PARTICIPATION OF WOMEN IN INDIA

**S.M. UNWAN**

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### **Abstract:**

The political empowerment of women is an important social activity that contributes to progress and prosperity. As a measure of a woman's standing, political participation and women's empowerment are widely accepted around the globe. Women are still underrepresented in leadership roles. The goal of this article is to evaluate the challenges faced by women in India's political involvement, as well as their political participation in other countries, using statistics, comparisons, and the empowerment of women. This study's methodology is based on a narrative approach. Many factors, including economic, religious and social and cultural, all contributed to the low political participation of women in the country as a whole according to the study's results. Data on female political involvement shows a gradual rise in the number of women in politics, as seen in India's female political participation between 1952 and 2014. According to research, more women are getting active in politics. This study focuses on both political empowerment and women's involvement in politics. To ensure that women have a valid role in society and have the ability to make decisions about their own lives, as well as to build a democracy that is both authentic and long-lasting, it is essential that they participate in politics. This will not only help them grow as individuals, but it will also open doors for them in terms of their professional and societal standing. Participation in public life will help resolve a slew of societal ills.

*Keywords: politics, women, empowerment, participation, challenges*

### **Introduction:**

**E**mpowerment for women may include having the same status as men, as well as having the opportunity and freedom to create one's own identity. In order for women to be empowered, they must learn how to be monetarily independent, self-reliant, have a good sense of self-worth, and be able to take part in the decision-making process. Forbidding discrimination on the basis of race, religion, and socio-economic class, as well as outlawing human trafficking and forced labour, and reserving elected positions for women, are some of the ways the Indian Constitution strives to reduce gender disparities. Equal rights for men and women is a driving force for women's engagement in political parties. In India, women's rights are severely restricted, and this disparity in status dates back to the earliest days of written history. When it comes to education and employment opportunities, men and women are not equal. It has been shown that women continue to accept the unjust gender standards that are still widespread in our culture. According to Mohini Giri's when compared to men's political participation in India, women's involvement is not particularly significant.

Allowing women to exercise and benefit from their constitutionally guaranteed rights will be a huge step toward achieving true gender equality. There is a shocking lack of women in political decision-making

bodies in both the state legislatures and the national legislatures of both countries. Injustice and bigotry against women persist because there isn't enough place for them in these political institutions and decision-making bodies. As a matter of fact, women's liberation is a movement to achieve equal rights, equity, liberty, and dignity in all domains of life. To ensure that the problems and issues of women are taken into account and dealt with in mainstream decision-making processes, women's political participation is essential. We'll focus on the most important parts of women's empowerment because the topic is so broad and has so many indicators of its importance. Economic, social, political, health, and educational contributions are all examples of how women's empowerment may be split down into five distinct areas.

### **Objectives**

1. To gain an understanding of the role of women in politics, as well as their political consciousness.
2. To investigate the factors that contribute to the low degree of engagement of women in Indian politics and policy-making.
3. To investigate the obstacles that women experience in fulfilling their responsibilities in electoral politics.
4. To learn more about the status of women in the National Parliament.

### **Methods of Investigation**

The majority of the material for this study was gathered from secondary sources, such as books, journals, government publications, and the internet.

### **Prior to independence, political engagement was encouraged.**

In India, women have been elevated to a position of prominence in society. During ancient times, ladies were treated on an equal footing with men in all realms of life, including politics and philosophy. Although the status of women in society has worsened through time, they have been relegated to the background in terms of political power over the years.. In reality, Gandhi's conceptions about and approach to the role of women in the independence movement stood in stark contrast to the long-standing biases against them that had been engrained in the Indian mentality since the dawn of civilization. During those times, the social condition of women was horrible, and it was largely thanks to the intentional efforts of the leadership, who were at the vanguard of the independence movement, that women were able to fight against the strength of the British empire in conjunction with men and achieve victory. The late Mahatma Gandhi thought that women must have a more significant part in politics in order for it to become more accountable, transparent, and free of corruption. On April 21, 1946, he wrote in Harijan, emphasising the need of enlisting women as voters, imparting or arranging for them to get practical education, teaching them to think independently, and releasing them from the chains of caste that bound them in order to bring about a change in them. The current dirty environment will be purified if they follow through with their plan. The national authorities saw our independence movement as part of a larger effort to restructure the socio-economic and political structures of the future, with the goal of ensuring, among other things, equality for men and women. Tilak believed that political engagement on the side of women could be independent of their social standing and that political action, rather than social change, was potentially more essential in terms of empowering women than social reform.

### **Participants in post-independence period: women's participation**

Women's autonomous groups have emerged across India in the post-independence era, that aims to combat patriarchy. It takes up a number of themes like as violence against women, increased representation

of women in political decision-making, and so on, both at the activist and academic levels. Despite the fact that India has a strong and active women's movement, the country still has a long way to go before it can attain gender equality and gender justice. In India, the subject of women's empowerment is still a contentious one

There are several reasons for why she is still considered less than a full member of society, including illiteracy; cultural norms and practises; economic destitution; and a lack of education. Because of her unwillingness to take responsibility for her own political future, the government's policies are ill-informed and misguided. Women's participation in the political process is essential to the empowerment of women.

### **Provisions of the Constitution**

The Indian Constitution established a parliamentary system of government and ensured that justice, liberty, and equality were guaranteed to all residents (men and women). Women are guaranteed equality of treatment under the Constitution, which also calls on the state to take efforts to alleviate the socioeconomic, educational, and political disadvantages that they experience, among other things. As a result, the ratification of our Constitution signaled the beginning of a new age of equality for Indian women.

According to article 15(3) of the Constitution, the Constitution provides equal political status to women, and also provides for the possibility of 'positive discrimination' in their favour. Men and women are treated equally under the law, and there are several more provisions in the Constitution that support this principle. It is Article 14 of the Indian Constitution that guarantees equal protection of the law and equal access to justice for all citizens. Article 15 of the Constitution prohibits discrimination on the grounds of religion, race, caste, sexual orientation, or place of birth.. As a result, it provides protection against all forms of discrimination. According to Article 15(3), nothing should preclude the state from establishing specific arrangements for the benefit of women and children in certain situations or circumstances. All citizens are guaranteed equal treatment in situations related to employment or appointment into any post under the jurisdiction of the state, as stipulated in Article 16. Second, no citizen shall be ineligible for, or be discriminated against in the application for, any employment or office under the state on the basis of religion, race, caste, gender, descent, place of birth residence, or any combination of these factors, nor shall any citizen be subjected to any form of discrimination in the application for any employment or office under the state. In addition, workers' physical strength and the young age of children should not be exploited, and no citizen shall be pushed by economic necessity to pursue activities that are unsuitable for their age and physical strength shall be safeguarded. Constitutional provisions 39(a) and 39(d) state that the state shall direct its policy toward securing the right to an adequate means of subsistence for both men and women equally, and 39(e) states that the state shall direct its policy toward securing the right to equal pay for equal work for both men and women equally, respectively. Article 42 of the Constitution provides for the protection of reasonable and humane working conditions as well as maternity leave, and Article 51(A) (e) of the Constitution refers to the basic obligation of citizens to abandon behaviours that are detrimental to the dignity of women. The 73rd and 74th Constitutional Amendments have provided for the reservation of one-third of the seats in panchayats and municipalities for female candidates. While the latter has been accessible and enjoyed by a great number of women, the right to equal participation remains a faraway goal for the majority of the population. Because of a paucity of opportunities for involvement in political bodies, their presence in these decision-making bodies has been limited to a few individuals. Women are the world's largest group of people who are excluded from participation in politics. In the world's national parliaments, women make up 21.9 percent of the total membership. Women possess 26.6 percent of the vote in the

United States. Women make up 18.3 percent, 26.2 percent, and 8.1 percent, respectively, of the House of Representatives and the Lower House of parliament in the developed countries of the United States, France, and Japan, according to the United Nations Development Programme. In India, women made up only 11.4 percent of the National Parliament, according to official figures.

### Conclusion

Women's empowerment has the potential to have a good impact on not just their own lives, but also on the lives of men and, of course, on the lives of children. Political parties cannot afford to be oblivious to the 586.5 million women who make up the population and roughly 48.46 percent of the electorate in this country (2011 census). Despite the fact that almost all political parties have attempted to establish women's organisations in order to secure their support and broaden the scope of their organisations, in practise they have fielded a significantly lower proportion of women candidates in elections, resulting in them having a proportionately lower representation in legislative bodies than their actual population strength. It is vital to make it mandatory for all political parties to nominate at least one-third of their candidates from female backgrounds in their party organisations, as well as to lay the groundwork for women's political engagement. Women are recognised as legal citizens of the country and enjoy the same rights as males. Women are powerless and abused both within and outside the house, despite the fact that the country's constitution states that they have the same rights as men. Consequently, all indications are that women's presence in politics deserves particular study and cannot be left to the forces that already control our political parties and administration at the national level. Even the most capable female members of parliament today feel marginalised and powerless inside their own political parties. The few women in leadership roles have been unable to attract bigger numbers of women to enter electoral and party politics, and they are an ineffectual minority inside their own political parties and organisations. As a result, it is imperative that we take particular efforts to increase women's political engagement in ways that will allow them to have an impact on decision-making at all levels of our society and political system. If our democracy fails to provide appropriate space for women to exercise their political rights, we have a significant problem on our hands.

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## CHAPTER 29

# AN ANALYTICAL STUDY ON MENTAL HEALTH OF WOMEN TEACHERS OF SECONDARY SCHOOLS

*Saswati Dash*<sup>1</sup>

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### ABSTRACT

In 21<sup>st</sup> century mental health of women is an important concern for everyone in the society. In the present days the social setup of India women teachers is poorly paid when compared to their less qualified compartments in other professions. The present study is conducted to examine the level of mental health of women teachers at secondary school of Balangir District. For this purpose a descriptive survey type, designed to obtain information about the mental health condition of women secondary school teachers based on their locale, marital status and management. The study was delimited to 100 women secondary school teachers of Balangir District. Mental Health Scale for Women Teacher - (MHSWT) prepared by Careen E.G.Marbaniang and Dr. Yodida Bhutia (2018) was used as a tool for the study, t-test was used to study the significant difference between the mean score of women teachers of different localities, management of the schools and marital status of the teachers. In comparison to rural and urban schools, the women teachers from urban secondary schools have better mental health than those of rural secondary schools. Women teachers from private secondary schools have better mental health than those women teachers of government secondary schools.

*Keywords: Mental health, Secondary school*

### INTRODUCTION

Mental health is a balance that is likely to exist between different aspects of human personality such as emotional, physical, social etc. Nowadays women are not only busy with their domestic work but are also playing other roles in society as teachers, doctors, lawyers, engineers, astronauts, ministers etc. It is generally observed that most of the working women are involved in the teaching profession. Women teachers assume a significant part in forming the predetermination of a country. Women teachers are more responsible as they are performing their dual duties, i.e. in home as well as in an organization. Both (Marbaniang & Bhutia, 2018) (Patel, 2014) men and women experience stress when they are not happy. Based on the report by the World Health Organization (WHO) found that stress has become an increasingly threatening disease in the world. WHO researchers found that stress is the global epidemic of the century (Seaward, 2006). This situation catalyzes the emergence of the phenomenon of stress that needs special attention in order to understand. Now, stress is everywhere and frequently cited as a major threat to the mental health of mankind (Andrews, 2005).

Female teachers are significant for schooling systems and for orientation fairness. Understanding and tending to the purposes behind the orientation awkwardness in teaching is significant. Ladies are

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brought into the world with sympathy, high profound remainder and so forth. Blessed with these virtues, women are certainly more equipped than their male counterparts to understand a child's ability to learn quickly. Teacher mental health issues are important because they not only have a detrimental influence on teachers themselves but also directly affect classroom outcomes. Study reveals that both male and female teachers have some level of mental health problems. However, when we compare the results, male teachers are healthier than female teachers. There are reasons, under Indian conditions, women bear dual responsibility of discharging duties at family front and professional. Service insecurity, lack of attitude towards profession, very high workload, poor salary and low status, low physical health and high moral expectation are some of the other contributing factors of women's mental health problems. Asserting that good mental health is associated with effective organization of various abilities so as to overcome strain and stress. A teacher having sound mental set up or health can satisfy the needs of his/her students more effectively. He /she earns respect in the class and can manage various problems associated with teaching and learning easily.

### REVIEW OF RELATED LITERATURE

**Lenka** (2018) conducted a study to know whether or not mental health affects occupational stress of secondary school female teachers. The objective of the study was to find out the status of mental health and occupational stress of married and unmarried women teachers as well as to study the relationship between mental health and occupational stress among female teachers. Tools of Dr. Jagdish (Agra) on employees mental health inventory (EMHI) and Dr. Minakshi Sharma and Dr. Satvinderpal Kaur on teachers occupational stress Scale (TOSS) were used to collect data. Finding of the study revealed that there was a significant difference in mental stress between married and unmarried women.

**Marbaniang and Bhutia** (2018) studied the mental health of women teachers of secondary schools of Meghalaya. Objective of the study were to find out the mental health of women teachers of secondary schools of Meghalaya and to find out the differences in the level of mental health based on the following criteria (a) Locale (b) Society (c) Material status (d) Educational qualification (e) Teaching experience (f) Management (g) Age and (h) Training. The investigator used a self-constructed questionnaire and adopted a survey method in which 405 women teachers from four districts of Meghalaya are selected as sample for the study. The major finding of the study was that the women teachers of secondary schools of Meghalaya have weak mental health.

**Gvosy , Panwar and Kumar** (2015) studied and access the level of personal mental health of school teachers working in public sector. The findings revealed that the male school teachers have better mental health conditions than the female school teachers.

**Pathak** (2015) studied occupational stress and mental health of primary school teachers. Finding out the mean difference between occupational stress and mental health was the main purpose of the study. The occupational stress index developed by A.K. Srivastava and A.P. Singh (1984) and mental health was measured by Dr. D.J. Bhatta and Gita R. Geeda (1992). Major finding of the study that significant difference in occupational stress and mental health with respect to both primary teachers male and female. While co-relation between occupational stress and mental health reveals 0.69 positive correlation.

**Kalita** (2015) conducted a survey of the well-being and occupational stress of women teachers of primary schools. The sample of the study was selected from 20 primary schools 120 women teachers by applying random sampling techniques. The major finding of the study were (i) Very few women teachers fall in low well being level category while majority of the women teachers fall in the category of the high

well being, (ii) Few women teachers fall in high stress level category while majority of the women teachers fall in the category of average as well as less stress well being category.

**Kataoka, et.al** (2014) studied occupational stress its related factors among university teachers in Japan. Objective of the study was to investigate occupational stress and its related factors among university teachers in Japan. The self administered questionnaire survey was taken for the study. 924 university teachers were taken for data collection. The most finding of the study was to indefinite the necessary for support of female teachers and younger lectures, who had a great tendency toward poor mental health.

**Reddy and Anuradha** (2013) studied occupational stress of higher secondary teachers working in Vellore district. The study's main objective was to examine the occupational stress of teachers working at higher secondary level. The researchers have adopted and re-modified the rating scale developed by Reddy (2006) and modified by Poornima (2010) for assessing the occupational stress of special educational teachers as a tool for this study. The major findings of the study are inventions in strengthening and reinforcing teacher's self-confidence and positive attitude, and weakening the stress creating factors.

**Patel** (2013) studied the mental health of school teachers with respect to their teaching experience and found that there is no significant difference in the mental health of teachers belonging to different levels of teaching experience.

### **STATEMENT OF THE PROBLEM**

The title of the study can be stated as “**AN ANALYTICAL STUDY ON MENTAL HEALTH OF WOMEN TEACHERS OF SECONDARY SCHOOLS**”.

### **OPERATIONAL DEFINITION OF THE TERMS**

- **Mental health:** As per the present study mental health is a state of happiness in which the individual realizes his/her own abilities to manage with the normal stresses of life completely and fruitfully.
- **Secondary school:** In this present study secondary school refers to class 9th and class 10th.

### **OBJECTIVES**

- To study the status of mental health of women teachers at the secondary level.
- To study the status of mental health of the rural and urban women teachers at the secondary level.
- To study the mental health of married and unmarried women teachers at the secondary level.
- To find out the difference in the level of mental health of women teachers based on management of the school.

### **HYPOTHESES**

- Ho1. There is no significant difference in the level of mental health between Rural and urban women teachers at the secondary level.
- Ho.2 There is no significant difference in the level of mental health between married and unmarried women teachers at the secondary level.
- Ho.3 There is no significant difference in the level of mental health among women teachers at the secondary level based on management of the school.

### **DELIMITATION OF THE STUDY:**

The study is delimited to a number of 50 secondary schools of Balangir district, Odisha only.

**DESIGN OF THE STUDY**

1. **Methods:** this study used a descriptive survey method to study the Level of Mental Health of Women Teachers .
2. **Population:** The population of the present study consisted of all the women teachers working at secondary school of Balangir district.
3. **Sample:** 100 female teachers were selected by stratified random sampling from several secondary schools in both rural and urban areas of Balangir district.
4. **Tools:** Mental Health Scale for Women Teacher - (MHSWT) prepared by Careen E.G.Marbaniang and Dr. Yodida Bhutia (2018) was used in this study.
5. **Procedure of data collection:** The researcher personally visited the selected secondary school of Balangir district for the collection of data.
6. **Statistical analysis:** for analyzing the quantitative data mean, standard deviation and t-test were used.

**RESULTS AND DISCUSSION**

The first objective is to find out the level of Mental health of women teachers of secondary schools.

**Table I - Mental Health of women teachers of secondary schools**

Score	Level	Frequency	percentage
157 and above	Excellent	1	1%
148-156	Very good	5	5%
140-147	Good	8	8%
131-139	Above average	17	17%
130-115	Average	37	37%
114-106	Below average	16	16%
105-99	Poor	7	7%
98-90	Very poor	7	7%
89 and below	Weak	2	2%

From table -1 it is observed that 1% women have excellent mental health, 5% women have very good mental health, 8% women have good mental health, 17% women are above average, 37% women are average, 16% women are below average, 7% women have poor mental health, 7% women have very poor mental health and 2% women have weak mental health.

**Hypothesis -1**

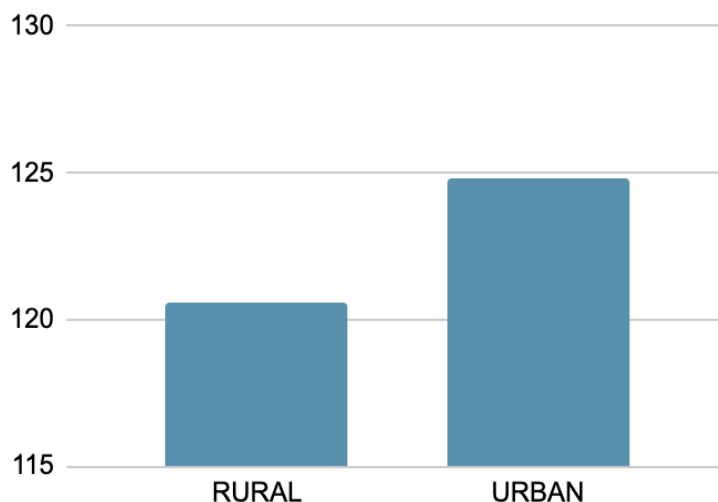
- Ho1. There is no significant difference in the level of mental health between Rural and urban women teachers at the secondary level.

**Table II- Difference in Mental Health of women teachers of secondary schools based on locale**

Locale	N	Mean	S.D	t-value	Level of significance
Rural	50	120.56	17.09	2.68	Significant at 0.05 ( $p < 0.05$ )
Urban	50	124.85	15.09		

The calculated t-value is greater than the tabulated value, so the null hypothesis is rejected at 0.05 level of significance. Hence the null hypothesis that there is no significant difference in the level of mental health between rural and urban women teachers at secondary schools is not accepted. The mean score of urban women secondary teachers is higher than the mean score of rural women secondary teachers. This means that the women teachers from urban secondary schools have better mental health than those women teachers of rural secondary schools.

Fig -1



From the fig-1 it is clear that Women teachers from Urban secondary schools have better mental health than those women teachers of Rural secondary schools.

**Hypothesis -2**

- Ho.2 There is no significant difference in the level of mental health between Married and Unmarried women teachers at the secondary level.

**Table III- Difference in Mental Health of women teachers of secondary schools based on marital status**

Marital status	N	Mean	S.D	t-value	Level of significance
Married	69	121.66	16.23	1.27	Not significant at 0.05 ( $p < 0.05$ )
Unmarried	31	127.00	16.52		

The calculated t-value is lesser than the tabulated value, so the null hypothesis is accepted at 0.05 level of significance. Hence the null hypothesis that there is no significant difference in the level of mental health between married and unmarried women teachers at secondary schools is accepted. This means that there is no significant difference between the mental health of married and unmarried women teachers of secondary schools.

**Hypothesis -3**

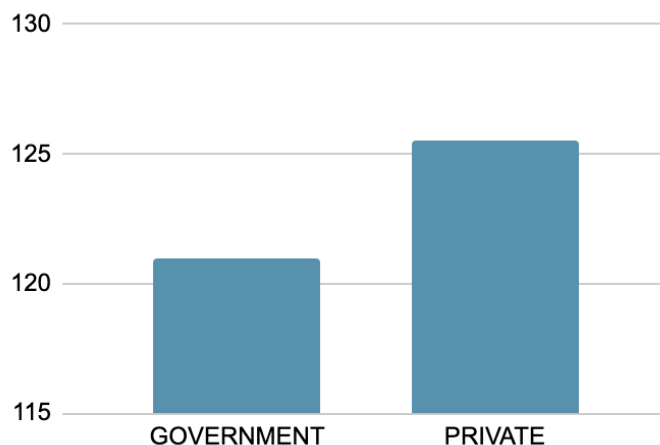
- Ho.3 There is no significant difference in the level of mental health among women teachers at the secondary level based on management of the school.

**Table IV- Difference in Mental Health of women teachers of secondary schools based on the management of the school**

Management	N	Mean	S.D	t-value	Level of significance
Government	53	120.96	16.23	2.55	Significant at 0.05 (p<0.05)
Private	47	125.56	16.52		

The calculated t-value is greater than the tabulated value, so the null hypothesis is rejected at 0.05 level of significance. Hence the null hypothesis that there is no significant difference in the level of mental health of women teachers of secondary school based on management is not accepted. The mean score of women secondary teachers of private managed schools is higher than the mean score of women secondary teachers of government managed schools.

Fig -2



From the fig-2 it is clear that Women teachers from private secondary schools have better mental health than those women teachers of government secondary schools.

**CONCLUSION**

From the above discussion the researcher can conclude that the overall mental health of women teachers is weak. The mental health of women teacher from rural schools and government managed school

need to be improved. Only if a teacher is mentally healthy, free from anxiety and stress then only she can promote mental health and mental hygiene. Therefore, in order to have a controlled and balanced emotional development of a child the mental stability of a teacher must be maintained.

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## CHAPTER 30

### EFFECTS OF DIFFERENT HEAVY METALS ON FISH HEALTH: A MINI REVIEW

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#### **Abstract**

The purpose of this review was to check the accumulation and attention of heavy metals in different organs of fresh Water fishes that comes in contact with the water defiled with the heavy metals. The subordinated fish were exposed to cadmium (Cd), zinc (Zn), chromium (Cr) and lead (Pb) at sub murderous situations. Heavy metals entered in bodies of fishes by Three implicit ways by gills, by body face and digestive track. The estimated accumulation of heavy metals in the Liver and gills were in order of Pb> Cd> Ni> Cr and Cd> Pb> Ni> Cr. Similarly, the order in case of kidneys and Tissues was and Pb> Cd> Cr> Ni and Pb> Cr> Cd> Ni. In *Cyprinus carpio* (Common carp) the attention of Cadmium and lead was designedly raised in tissues as compared to the other heavy essence. Heavy metals accumulate in Fresh water and elevate through food chain and fishes are poorly affected because they're top consumer in submarine Systems. Humans are also affected by input of fishes for substantially people of those areas where main food is fish.

*Keywords: Gills, heavy metals, food chain, consumer.*

#### **Introduction**

The universal problem is the environmental pollution and most important adulterants are the heavy Metals in submarine network because of their toxin, accumulation magnification by marine Brutes. Domestic, artificial and anthropogenic conditioning may astronomically come the source of natural Submarine systems impurity of heavy metals. The pollution caused by heavy metals might have. the heavy essence pollution have dreadful goods on the environmental equilibrium and a variety of submarine Realities. In the list of beast species, mischievous goods of these adulterants, can no way be negligible for fishes. Fishing is also general pastime including in civic areas. The adulterants Similar as heavy metals bioaccumulate in food chain and beget the negative goods, indeed death so fish Among other creatures are used to determine the health condition of submarine ecosystem. Accumulation patterns are more in some fish species than others because of the capability of fish to Bioaccumulate metals. Heavy metals in fish come substantially from their diet, and situations of Bioaccumulation of pollutants are advanced in fish which comes advanced in food chain. In this study, the situations of five heavy metals i.e. zinc, nickel, cadmium, lead and chromium has been determined from The fishes, sediments and water. Heavy metal concentrate in water and entered into the food chain. the Patterns of bioaccumulation of heavy metals are determined by the absorbance and excretion rates of fish. Different factors similar as physical and chemical parcels of water as well as seasonal changes are the reason of significant addition of essence in different fish tissues. Metal residual problems in the fish epithelium are stern, because of the presence of

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advanced essence attention in water and Sediments. On the negative, heavy essence are of serious concern in this respect because they can be Fluently elevated in the food chain due to their bioaccumulation processes. The pattern of heavy metal Uptake in fish is different in different species according to some factors i.e. the experimental and Cerebral factors and also the age of the fish. Fish can transport major salutary sources of arsenic and Mercury to humans because of their advanced uptake medium in their tissues towards these rudiments. Reused water from the, soap, cloth and ornamental diligence present near the swash water have High Attention of heavy metals, which beget the dislocation of the ecological balance of swash water if Present in much advanced attention. The scheme of accumulation regarding heavy metals in the liver and gills was plant outside for Cd and Pb independently.

#### **Possible effects of heavy metals on fishes.**

The toxic effects of heavy metals can influence the individual growth rates, physiological functions, mortality and fecundity in fish, Heavy metals enter in fish bodies by three possible ways: by gills, by Digestive track and body surface. The gills are considered because the significant site for direct uptake of metals from the water, though the body surface is generally estimated to require minor part in uptake of Heavy metals in fish. Heavy metal accumulation also can be caused by the food source, possibly Causing to bio-magnification, the augmentation of poisons up the organic phenomenon. The periodic difference of Heavy metals supported the information of two consecutive years and samples gathered from the fish farm exposed The following result: summer > autumn > winter > spring. As a person's food, Fish are considered as an Excellent source of polyunsaturated fatty acids (predominantly omega-3 fatty acids), protein, Zn, iron and Calcium. Seafood are a good more important and safe source of food in future for protein and Fatty acids for human intake and products made of aquaculture. Various factors that are Considered to be critical are size, developmental stage and salinity in heavy metal marine and Estuarine organisms. Affected organisms show response to heavy metals by accumulating in their bodies or by shifting to the following trophic level of the organic phenomenon

#### **Effects of chromium on Pisces**

Heavy metals accumulated in fish either from the girding water or by ingestion of food in Terrain Due to anthropogenic conditioning natural water is being defiled by this metal. The Chromium attention in lakes stated to range between 1 to 10 ug/ L and EPA Recommendation for admissible position are 50 to 100 ug Cr/ L for protection of human health and submarine Life respectively. Some species of fishes have toxic effect of chromium as echoed in the blood changes Similar as anemia, eosinophilia and lymphocytosis, bronchial and renal lesions. chromium known for its Lower accumulation in fish bodies while the advanced attention of Cr damages the gills of fish Swimming near point of Cr disposal.

#### **Effects of cadmium on Pisces**

Cadmium is the unnecessary and most poisonous heavy essence which is extensively distributed in the submarine terrain and earth's crust. In the list of heavy essence similar as lead, mercury and cadmium are considered to beget public health hazards. Burning of fossil energies and external waste are known to be largest sources of cadmium release to the terrain (similar as coal). Cadmium may also enter into the atmosphere from zinc, lead or bobby smelter. It can enter into the fresh water by disposal of artificial and ménage waste. Diseases frequently contain some cadmium. Reproduction rate of submarine organisms may also be affected due to Exposure to heavy essence and can lead to a gradational extermination of their generations in weakened waters. For illustration, Cd and mercury (Hg) damage the order and produced

signs of habitual toxin, including bloodied reproductive capacity and order function, excrescences, hypertension and hepatic dysfunction. Fish creates major sources of Human beings food which is protein. fishes are major part of the human diet and it's thus not surprising that multitudinous studies have been carried out on essence pollution in different species of comestible fish. The nutritive need of different tissues of fish depends on their biochemical configuration like mineral contents, amino acids, protein and vitamins, etc. The sub murderous attention of Cd has showed diversions on the electrophoretic arrangements of protein parts in gills and muscle *O. mossambicus*.

### **Effects of Zinc on Pisces**

Zinc can accumulate in the bodies of fish, when they live in Zn polluted water courses. When zinc enters into the bodies of these fishes, it results in bio magnify up the food chain. The Zn attention in Fish gill dropped meaningfully with adding length of the fish, is regarded as a controversial subject Zinc, an essential element, is one of the most common heavy metal adulterants. The sources of zinc and Other heavy metals in natural waters may be from geological gemstone riding or from human conditioning Similar as artificial and domestic wastes water discharges and creatures where it forms constituent Functions in maintaining cytoplasmic veracity. Still at advanced attention, Zn produced Adverse goods in fish by structural damages, which affects the growth, enhancement and survival of fish. Zinc accumulates in the gills of fish and this designates a saddening effect on gill respiration leading which results in death. Zinc pollution also tempts changes in ventilator and heart Physiology. Sub-lethal situations of zinc have been known to unfavourably affect hatchability, actuality and Haematological aspects of fish. Zinc could beget sub-acute goods that change fish actions. Similar Observed Actions include insufficiency of balance since utmost fins are stationary in the affected fish, Restless swimming, air guzzling, ages of dormancy and death. The Zinc taken as veritably Serious because of its almost unlimited continuity in the terrain because it just converted from One oxidation state or organic complex to another and can not be destroyed biologically. Zinc is a implicit Toxic to grope which causes disturbances of acid- base and ion regulation, dislocation of gill tissues and Hypoxia

### **Conclusion:**

Heavy metals (Cd), nickel (Ni), chromium (Cr) and lead (Pb) were tested in different organs like gills, livers, gills and fish tissues of the control fish enduring in natural water system. And utmost of the essence are present in comestible portion of fish. Humans are also affected by eating fish and can beget a many of health problems. The situations of poisonous rudiments in different fishes depend on the fish coitus, age, season and place. The pollution of aqueducts with anthropogenic conditioning are the major cause of submarine loss and imbalanced food chain. To exclude and avoided the submarine life loss there's need to use the advanced technologies generating lower heavy metal pollution to terrain.

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## CHAPTER 31

### SOFTWARE PROTECTION IN INDIA: PATENTS OR COPYRIGHT

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#### **Abstract**

Computer software is a creation of intellect and needs protection from unauthorized usage. The article examines the nuances of debate on the protection of software under the intellectual property regime. It traces down the roots of debate to TRIPS where patent protection is made available to any invention, whether product or process, in the field of technology provided the given criteria is met and does not mention software in the category of excluded patent subject matter. Apart from this, under Article 10, it makes provision for computer software, whether source code or object code. The absence of any clear guideline on the protection of computer software gives rise to the ambiguity surrounding this issue. The article seeks to throwlight on issues related to patenting of computer software, analyzes the economic and legal question of whether software should be granted patent or copyright protection with a particular focus on the Indian software industry. After taking into account factors such as the nature of the software industry in India, the term of protection, the extent, and threshold of protection, enforcement mechanisms, it has been argued that software copyright is a viable option as opposed to software patenting.

**Key Words:** *Computer Software, TRIPS, Copyright, Patent, Small and Medium Enterprises, Invention, Economically feasible*

#### **I. INTRODUCTION**

The Supreme Court declared in *Tata Consultancy Services v. State of Andhra Pradesh* that computer programs are the outcome of an intellectual process and so computer software can be copyrightable as intellectual property. Computer software, like any other intellectual property, is a work of intellect that should be protected. There are ongoing debates regarding the mode of operating protection to computer software. The article examines the debate concerning the intellectual property regime governing the protection of computer software. It looks into the legal and economic aspects as to whether software should be protected under patent or copyright regimes. With a specific focus on the Indian software industry, the paper argues for having a stronger copyright regime keeping in mind considerations such as the extent of the time, threshold of protection, and enforcement mechanisms.

Part III of the paper discusses the roots of the debate on software protection and traces down the ambiguous position on software protection at the international level. Part IV engages in looking into how the current software and patent regime function to accord protection to computer software. Finally, in part V, arguments in favor of opting software regime over a patent regime are advanced. This is done keeping in mind the kind of impact software and the patent regime would have on Small and Medium Enterprises (SMEs) engaged in software designing.

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## II. DEFINING COMPUTER SOFTWARE AND SOFTWARE PATENTS

A computer system consists of electronic and electro-mechanical equipment such as card readers, disk and tape drives, printers, visual display units. Such are known as 'hardware'. To make these hardware units function, such as accept data, manipulate it and print out the results, the computer is stored with detailed instructions which are known as a computer 'program'.

Computer Software popularly known as software is a term primarily used for a set of instructions or digitally stored data or programs used to operate computers and execute specific tasks. In such a way, the software includes all programs on a computer such as applications and the operating system. The New Oxford Dictionary for the Business World, defines software as "programs used with a computer (together with their documentation), including program listings, program libraries, and user and programming manuals". Software patents do not have a fixed legal definition. However, the Foundation of Free Information Infrastructure (FFII) has endeavored to define software patents as, "patents related to the performance of the computer-based software program."

Under Indian law, the term "software" is defined under the Copyright Act of 1957. "Computer Programme" is defined in Section 2(ffc) of the Indian Copyright Act, 1957. According to this section, a computer program is "as a set of instructions expressed in words, codes, schemes or any other form, including a machine-readable medium, capable of causing a computer to perform a particular task or achieve a particular result". This means that software necessarily connotes "program" concerning a computer.

## III. CONTROVERSY ON TRIPS AND SOFTWARE: TRACING THE ROOTS OF DEBATE

Currently, the most common modes of protecting computer software are patent and copyright. In highly advanced technologies, trade secrets are also relied upon for protection. According to Article 27 Paragraph 1 of TRIPS, "*patent shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application*". The issue of computer software patentability and exclusion is often what makes software patenting a contentious topic. Article 27.1 of TRIPS states that all inventions can be granted protection under patent law and a patent holder can enjoy the rights vested in such patent without discrimination based on the fields of technology.<sup>3</sup> The term 'innovation' is not defined in this clause. However, the article mentions patentable criteria and mentions that new inventions, involve an inventive step and have the industrial application can be granted patent. Further, Paragraphs 2 and 3 of the Article lay down certain exceptions to the patentable subject matter. It is crucial to note that nowhere computer software is excluded from patentable subject matter under these paragraphs. Article 10 of TRIPS, on the other hand, specifies that under the Berne Convention, computer programs, whether source code or object code, can be protected as literary works. In such a way, a dispute arises on the issue of protecting software under copyright or patent.

## IV. PROTECTION OF SOFTWARE

Software is challenging to categorize into a single intellectual property protection category. This is because the software has inherent characteristics which make it difficult to draw analogies with the existing legal subjects. Software protection has been classified as under copyright, patent, trade secrets, and even a sui-generis software right by the commenters. Software protection is complicated. Because software is not a monolithic work, and every type of software consists of multiple elements that may fall under several

categories of intellectual property protection, determining protection for software under a specific intellectual property can be difficult.

Software, in general, is linked to mathematical methods and algorithms and is divided into hardware-specific and application-specific software. The software can be classified into various categories, such as commercial software, shareware software, freeware software, and public domain software. These can all be covered by different laws according to their industrial application. Commercial software is copyright protected, and users must purchase it. Shareware software is less expensive and can be used for research and testing. Freeware software is available for download and can be copied without cost. It's in the public domain. Public domain software, as the name suggests, operates in the public domain and can be used without any restriction as the same is not copyrighted. Such software can be copied and used in some other program without any restriction.

While *Diamond v. Diehr* set a precedent for the future of software patents, still, software developers and companies had to fight for protection on their products. The problem arises from the interpretation of protections offered under the copyrights and patents regime.

#### **4.1 Protection under Patent Regime**

Initially, the Patents Act of 1970 had no provision on patenting of computer programs. The Patents (Amendment) Act, 2002 proposed an amendment to Section 3(k) and limited the scope of patent protection to “computer program per se”. Later, Patent Amendment Ordinance, 2004 was passed which sought to amend Clause 3(k) and provided a wider scope to software patents. The Ordinance now clarifies that software that which has (i) technical application of computer programs to industry, and (ii) coupling of a computer program with hardware - can be patented if they otherwise meet the patentability criteria. This option was made to help India's burgeoning software industry grow even further.

The Ordinance attempts to achieve a balance between the proponents and opponents of patent protection to software. The effect of the 2004 ordinance was such that there were conflicting interpretations at the patent office wherein some examiners granted patents to software combined with hardware or software with a demonstrable technical application of some sort. Furthermore, the clause was eliminated from the 2005 Act due to strong resistance from the free software movement and the prospect of multinational firms exercising monopoly power. The Patent Amendment Bill of 2005, which restored the stance on software patents to what it was in 2002, had the desired impact. As a result, the former stance under the Patents Act of 1970, that a computer program is not patentable in and of itself has prevailed.

The Indian Patent Office published the Draft Manual of Patent Practice and Procedure in 2008. According to it, “*Claims directed to technical process, which is carried out under the control of a computer programme (whether by hardware or software) cannot be regarded as relating to computer programmes as such....Claims relating to software programme products are nothing but computer programmes per se simply expressed on computer readable medium and not allowable.*” Section 3(k) of the Patent Manual has given a very brief and ambiguous interpretation, with no explanation or any examples indicating what can be granted patent protection. It is a legally non-binding document and in the absence of any official guidelines, there is a dire need of having a judicial explanation to clarify what is and what not is a software programme *per se*.

#### **4.2 Protection under Copyright Regime**

Protection under copyright is the most common method of ensuring protection to software because writing codes is akin to any other form of literary work. Copyright Act, 1957 grants protection original

expression of the idea. Under Copyright Act, computer programs are considered literary work. Section 2(o) of the Act defines ‘literary work’ and includes computer programs, tables and compilations. Literary work covers work, which is expressed in print or writing irrespective of getting into its literary merit or quality. Section 13 lays down the types of works in which copyright subsists and includes original literary works therein.

Even though the act defines computer program under Section 2 (ffc), it does not differentiate between source code and object code and they are covered under the purview of Act as the literal elements of computer programs. Under the Act, a computer database is protected as literary work even when such only involves ‘sweat of the brow’ and no creativity. This position stands varied from the ruling laid down by the US Supreme Court under *Fiest v. Rural Telephone* where the Court did not provide protection to the white pages of a telephone directory on the reason that protection under copyright law extends only to those works which involve creativity, judgment, or skill and not mere labor. Furthermore, when programmes intended to operate computers meet the criterion of originality, they are often considered as artistic and literary work.

## V. SOFTWARE COPYRIGHT OVER SOFTWARE PATENT

Some authors have opposed the protection of software under the patent regime. Scholars such as Gordon Irlam and Ross Williams have argued that software patents cause a serious threat to the software industry. The pace of development in software is rapid. They highlight a key issue with obtaining software patents, stating that due to the rapid expansion of the software business, individuals who invest time in generating and filing patents far outpace those who invest time in pushing such ideas to the market. By the time a young technology matures to the point where it may be used in goods, it has accumulated a dozen or more patents, making it financially unviable. This creates a lot of uncertainty in the development of new software. Further, the software industry is market-driven rather than being innovation-driven. Having said that, the philosophy of the software industry is ‘doing it right the first time rather than ‘doing it first’. Consequently, the rationale behind patents i.e. encouraging inventions for the sake of inventions is against the philosophy of the software industry and stands opposed to it.

The Indian software industry is such that it is mostly represented by a large number of private domestic organizations, which in most scenarios are small in terms of their assets and finance. This points out the need for having such a protective regime for software that could take into account the needs of these small enterprises from the threats posed by larger Indian players.

Accordingly, the multiple reasons for choosing software copyrights over software patents are discussed underneath:

### 5.1 *Software Patents do not stimulate innovation*

The key advocates of software copyright contend that companies do not invent to get a patent monopoly. Surveys by numerous scholars reveal that getting patents is not the driving force in making innovations, especially in the software industry. It has been observed that a vast majority of patents for software are obtained by firms operating outside the software industry with little inputs required to develop software inventions. Scholars have observed that firms that prefer to apply for patents have more capital and engage more engineers and programmers as their workforce. As a result, in 1990s, manufacturing firms accounted for 75% of software patents in contrast to 7% of software patents as applied by the firms engaged in the software industry.

The idea that the Software Revolution, which began towards the end of the 20<sup>th</sup> century, is driven by the patent regime is unlikely. It is observed by some that the innovation in the software sector was driven much before the software was included as a patentable subject matter. Thus, it is unlikely that the patent protection to software became a driving force in the evolution of the software industry.

Not only this, the experiment conducted by Bessen and Hunt also indicates the absence of any relationship between the number of software patents and R&D investments, which suggests that granting patent protection to software is not a very useful method for promoting innovation. This data supports the argument that patents do not provide a substantial incentive for inventing software. So, the very purpose behind granting a patent, i.e. encouraging incentive to innovate, is neglected by this argument

### **5.2 *Patenting software allows broad reservation of rights***

Proponents of the “Prospective Theory” of patent interpretation claim that the patent regime grants protection to more than the literal subject matter of claim by including the prospective technology under patent protection which is inherent in the earlier patent. It is claimed that patent grants protection not only to the invention but also anything which may be remotely related to the invention. In such a case, the issue that arises is to consider how fair it would be to exclude future incidental advantages from the field of further research and development due to the wide nature of protection under the patent regime. We can correlate this to the fact that the software industry mainly innovates on an incremental and cumulative basis and does not create building block inventions. Therefore, the argument suggests that granting a broad scope of protection to incremental inventions undermines the very rationale behind patent protection, which is to promote innovation rather than protect incremental improvements in existing technology.

It is material to note that if such protection is granted, the patentee would be able to extract royalties for nearly all the improvements, whether literally infringing or not, and the newcomers would be required to take permission for developing and marketing their innovation. Such a scenario would unjustly benefit a few while creating a rigid monopoly in the industry.

### **5.3 *Software Patent could discourage further invention***

Another issue in granting software patents can be discussed in terms of the period for which grant of a patent to software is made. It is crucial to engage in discussions on questions surrounding the period of high quality and exclusive protection that will be granted if the software is patented at all. The term of protection under the current Indian patent regime is 20 years. It is very obvious from the nature of the software industry that once software is invented, it will stand as a marketable product for a period of around two to three years before some other improvised version is invented. In this scenario, attention is to be given to the stagnation that will occur as a result of the nature of the industry and the protection granted. No one would be entitled to use the software and create or invent around it, or make a better version of it as it will amount to infringement.

An adverse effect of the above-mentioned argument would be on interoperability and standards of openness, which form two crucial characteristics of software. If a software patent is issued, the holder will have a monopoly on developing all related software that enables interoperability.

### **5.4 *Software Patents are not economically feasible***

While having a debate on the protection of software, it is also crucial to look into the economic feasibility of granting protection under the copyright or patent regime. The Indian software industry is mostly made up of SMEs that have fewer financial resources to compete with larger companies. Software

patents will only make it difficult for these SMEs to defend their creations as the costs incurred in acquiring and defending such protection under patents could stand unaffordable to them.

It is material to note that in case of software is patented, it could be technically difficult for someone to develop an alternative that falls outside the scope of an existing software patent. So, the cost of the license fee that a developer would be needed to pay for using such a patent shall be taken into account while proposing patent protection to software.

## VI. CONCLUSIONS AND SUGGESTIONS

Keeping in mind the above arguments, it can be concluded that copyright protection to software is more beneficial in India. An advantage of allowing protection to the software copyright regime is that copyright accrues as soon as an artistic or literary work is created. In India, the current position is that software is expressly considered a literary work under Section 2(o) of the Indian Copyright Act. In such a way, a software developer does not need to apply to getting protection as the right *in rem* accrues automatically. Such saves a lot of time and financial investment which is involved in drafting and filing for patent protection.

Since the copyright regime grants protection if creation falls within specified categories and meets the criteria of creativity, it is more suitable for software because inventions related to software are more cumulative than building blocks in nature. This ensures that the right of the creator over the software is secured, and also allows other inventors to come up individually with improved and new software.

Under Article 10 of TRIPS, computer programs, whether source code or object code, are protected as literary work under the Berne Convention. The protection of software through copyright is uniformly recognized worldwide as there is an international mechanism for the protection of software in terms of the Berne Convention as opposed to the absence of any international mechanism for protecting software under the patent regime. In such a way, it is advantageous for Small and Medium Enterprises in India to opt for the protection of their innovations under the copyright regime as it would enforce protection worldwide.

Adopting a software regime for protecting computer software is also beneficial to indigenous creators as it would allow them to use defenses such as *scenes a faire* and fair use to work around existing cumulative protected programs which have already been granted protection, but otherwise serve no purpose. This calls for the extension of these doctrines in the judicial domain, since they may not actually be expressly suited for use in software cases, so that the defense of copyright in software may be improved. At least in the US, copyrights have been given very powerful protection by the courts. Injunctions are liberally granted along with awarding of punitive damages. Not only this, the infringing content is most sometimes impounded. If India adopts a similar jurisprudence, indigenous firms will get benefitted to a greater extent as their creative expressions will be well compensated in case of infringement, especially when such infringement is driven by big players having a lot of funds.

Furthermore, the assertion that copyright offers only a minimum level of quality protection could operate in favour of the domestic software business. Because copyright infringement is defined in the Act, there could be no infringement when individual inventors independently come up with comparable software concepts. Instead, such a situation would serve as a motivation for businesses to develop new and enhanced versions of existing software. New software can be improvised to accommodate and interact directly between different operating systems, which can help with the creation of interoperability standards.

So, it is crystal clear that the arguments stand in favor of granting copyright to software as opposed to a patent by virtue of threshold of protection, enforcement mechanisms and considerations of period. In the cases software are protected under the patent regime, the burden on Indian software SMEs would be far

more than the benefits of granting software patent. Hence, what is required is not an entirely new regime but an improvement in the existing copyright regime.

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## CHAPTER 32

### DIASPORIC WRITING AS A LITERARY GENRE

*Umakant Avaraddi*<sup>1</sup>

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#### **Abstract**

Researches in multidisciplinary domains in literature, in general, is the need of the hour. It is one of the ways to broaden the scope of literary content. Multidisciplinary innovations enrich research expertise. English literature at the international level has undergone a plethora of changes both in prose and poetry. However, such studies have to have certain limitations too, not to force upon one another. A researcher has to keep in minds not to tailor the topic to his needs and convenience. He ought to address the genuine problem of the area concerned. On the other hand, such a study can evolve a thesaurus of research. It can explore new horizons in literature. The major issues that have emerged in the literary scenario are: Feminism, Writing in Diaspora, Colour Distinction, Cultural and Racial Superiority, Cross-cultural assimilation and Marginalization of the Dalit Community. For instance, Black Literature is the result of the suppression and depression of the Afro-American people. This paper deals with diaspora writing that was triggered by a plethora of reasons like new approaches, challenges, trends, movements, ideologies and philosophies that have evolved in World Literature not to speak of Indian literature. Thematic content of the Diaspora Writing may encompass nostalgic sentiments, loss and search of identity, alienation, and multicultural ambience, issue of alien languages, shattered families and broken homes. Migration and technological innovations have impacted the literary ambience to such an extent that literature written in Diaspora has carved a niche for itself as a literary genre. Its inception was observed when peoples of the world dispersed from their motherland to a host land. It may be forced or voluntary. A lengthy list of Diasporas (like Indian, Sri Lankan, American, Australian, British Diasporas and so on and so forth) is available. A typological study has shown that migration may be due to victimisation, trade, employment, civil war, racial discrimination, labour, social strata on the basis of colour, caste, economic plight, religious superiority, employment, colonialism and even brain drain.

*Keywords: Multidisciplinary, feminism, marginalisation, victimization*

**D**iaspora refers to voluntary or forced displacement of an individual or a group of people of a community who migrate may be for personal reasons or for the dissatisfactory circumstances prevailed in the homeland. They try to discover solace and satisfaction in an alien country. This affects cultural and linguistic transition. They pass through and suffer alien, nostalgic and traumatic ambience neither can they have cultural nor self-identity. The reasons concerned may be multi-racial, multi-cultural and/or multi-ethnic:

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The history of the experience of being a diaspora dates back to eighth century BCE with the Jewish, for their being exiled into many countries owing to the invasions and they used the term diaspora to have the feeling of connectedness. To quote Baumann's words, "in the western common knowledge, the notion of exile is predominantly bound to the experience of the Jewish people in the first millennium BCE (20)".

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It is the outcome of a pluralistic society. In the modern sense of the term, Diaspora is because of globalization too. In other words, the pursuit of work, higher education, financial leverage, marriage, trade or business gives room for migration. A Diaspora writing has developed its own features as an independent genre in World literature. Thus the nomenclatures like Indian Diaspora, Sri Lankan Diaspora, African Diaspora and American Diaspora were coined.

In the backdrop of the Indian Diaspora, Anita Desai, Bharati Mukherjee, Shauna Singh Baldwin, Amitav Ghosh, Anjana Appachana, Sunetra Gupta Anita Nair, Jhumpa Lahiri, and Chitra Banerjee Divakaruni have set the Indian element in their writings in the forms of novels, short stories, travelogues, poems and prose. Their writings portray the oddly orthodox traits of the Indian traditions, religions and cultures. For this reason, it can be assessed that this Diaspora is one of the largest ones in the world. To quote an example of Bharati Mukherjee and Shauna Singh Baldwin:

As an immigrant, Bharati Mukherjee faced the same problem to adapt to the traditions, culture, and society of a foreign country represented by the lifestyles of the two protagonists Jasmine and Dimple.

Shauna Singh Baldwin (Shauna Singh Baldwin) is a poet, short story, prose, and novel writer. She represents the experiences of the main characters in three different environments: India, the United States, and Canada. Baldwin developed the themes of cultural exchange and exile, involving a variety of narrative strategies.

In the novels of Jhumpa Lahiri like *The Explainer of Disease*, *The Man of the Same Name*, *The Unusual Land* and *The Lowlands* one discovers the struggle and strain of the immigrants. These novels reveal the nostalgia, longing, uprooting and loss of self-identity.

Anjana Appachana's collection of short stories deal with the dilemmatic situations confronted by the Indian women abroad. In her novel 'Listening Now', she goes through the problems among the three generations. She sketches the contrary features between an orthodox Indian woman and a modern one.

Anita Nair has nine novels, two plays and a collection of short stories to her credit. She has sketched her women characters as rebellious in nature. Women Diaspora Writers have revealed feministic views in their writings. Anita Rao Badami, in Canada, is best known for her novel 'The Hero's Walk' deals with the frustration found in a family life. Chitra Banerjee Divakaruni's *Arranged Marriage* and other Short stories are set in the background of American culture. Her characters are cosmopolitan in ideology.

Thus, Diaspora writing has evolved a genre with definite features and content. Every country in general has Diaspora writers and the list is so lengthy that it can take hundreds of pages to list and illustrate the different reasons behind the stories:

The list of diaspora writers is long and detailed. Readers of diasporic literature occasionally experience different and disgusting trends in life in a foreign country. Sometimes they even know themselves through the central character and other powerful characters in the work. In this way, Chitra Banerjee Divakaruni immigrated to the United States and became a diasporic writer of English literature in India. Her award-winning novel "Mistress of Spices" (1997) depicts an Indian girl who works in a spice shop in Oakland, USA. She uses the magic of spices to solve other immigrants' problems. Thus, all the diasporic writers depict immigrants' issues vibrant in their literary works. 3

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## CHAPTER 33

### BLACK LITERATURE: A MULTIDISCIPLINARY GENRE

*Umakant Avaraddi*<sup>1</sup>

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#### **Abstract**

Literature is not walled in by narrow-mindedness; its generosity welcomes all and sundry as far as its content and thematic values are concerned. The growth of world literature has generously contributed to its scope. It is the mirror that reflects every nuance of the universe inclusive of the exhaustive aspects of human life. For instance, Black literature is the literary corpus created by, about, or for the Africans who have settled in America. It is otherwise called African American or Afro-American literature that has taken the form of an independent genre. It is the result of the slavery of the Black and the racial disparity of the white. This body of literature encompasses the writings of the enslaved writers and the narratives of the slaves. They made their fullest efforts to recount their experiences and plight. Black Americans evolved a form that demands social change and justice. Afro-American literary tradition sketches their accounts in all walks of their lives. Their oeuvre speaks volumes about the traumatic history of the Africans in America. Their luxuriating usage of their language can be given the nomenclature of Black Jargon. A compendium of the contributors to Black literature is found in profusion; they have expressed themselves in all forms of literature; there are poets, playwrights, novelists, essayists, and short story writers. They are bound by solidarity. The inception of Afro-American literature began with the interviews of the fugitive slaves and their narratives. A slave narrative can be called a genre. It includes the autobiographical stories of the ex-slaves too. The Harlem Renaissance (1920-1940) had bloomed into a Literary Movement of the Black people. Their only objective was to delineate the atrocities in bondage. Their writings teemed with the ills and evils of slavery, may it be *Aunt Phillip's Cabin* (1852) by Mary Henderson Eastman or *Incidents in the Life of a Slave Girl* (1861) written by Harriet Jacobs and writers like Langston Hughes, Maya Angelo, Phillis Wheatley, Alice Walker, Sterling Brown, Toni Morrison, August Wilson to name a few.

**Keywords:** *Multidisciplinary, thematic, narratives, solidarity, bondage,*

**B**lack literature has a lengthy history founded during the days of the bondage of the Africans who had migrated to America. The black slaves had to tread on the thorny paths and thoroughfares that were fraught with tortures exerted by the white Americans. The inception of Black literature as a genre in the 18<sup>th</sup> century has been a milestone in World literature. Jotting down the whole history of this literary genre is like bringing an ocean into a bottle.

Afro-American literature sheds a bright light on the themes of cultural superiority, racism, inequality, and slavery as far as Black people in America were concerned. It was the time when the United States of America was in the formative stage and had hired Africans to work in their plantations. Exploitation was the only intention of the owners. They had intended financial leverage.

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The Abolition Movement (1830-1870) against slavery, a united effort of the Blacks to root out servitude, and the American Civil War (1861-1865) accelerated the production of Black literary pieces. The seed of enslavement flowered profusely. When the pitiful plight of the helpless slaves became inevitable there appeared *Slave Narratives* on the literary Horizon. Slave Narratives can be broadly classified into three significant headings: *Religious Redemption, Inspiration for Abolitionist Movement, and Motivation towards Progress*. They were autobiographical in nature.

These narratives related the lamentable life of the African serfs in America. The writings were the reflections of suppression, oppression, exploitation, violence, and sexual harassment. They demanded their rights:

The earliest African American writers sought to demonstrate that the proposition “*All men are created equal*” in the Declaration of Independence required that Black Americans be extended the same human rights as those claimed by white Americans.<sup>1</sup>

Jupiter Hammon (1711-1806), another slave whose poetic pieces and sermons buttressed the birth of Black literary output. His poem “*An Evening Thought: Salvation by Christ with Penitential Cries*” (1761) and ‘*Ode to Phillis Wheatley*’ demanded emancipation.

Olaudah Equiano, also known as Gustavus Vassa, (1745-1797) wrote a two-volume autobiography called *The Interesting Narrative of the Life of Olaudah Equiano; or, Gustavus Vassa, the African, Written by Himself*.

Phillis Wheatley (1753-1784) was one of the best Black poets. She proved her poetic mettle through her *Poems on Various Subjects, Religious and Moral* (1773). At the age of seven, she was captured and sold to a merchant in Boston. At 16, she had mastered the English language to refute the fact that a Black girl could be as intelligent as a white one. She was very good at literary form and metre too. It can be said that she pioneered Black Poetry in the real sense of the term. Equiano and Wheatley have been regarded as the prominent founders of African literature in English.

Harriet Jacobs (1813-1897) wrote her autobiography entitled ‘*Incidents in the Life of a Slave Girl*’ under the pseudonym of Linda Brent. The sexual harassment by her enslaver who had threatened that he would sell her children if she did not fulfil his erotic desire, was the pessimistically fatal moment of her life. Later in life, she established schools for the freed and fugitive slaves.

William Wells Brown (1814–84) was a historian, abolitionist, novelist, and playwright. He penned *Clotel; or, The President's Daughter* (1853), the first novel by a Black American; it dealt with the then rumour-like talk-of-the-town about Thomas Jefferson who had fathered a daughter with his slave girl.

Frederick Douglass (1817-1895) was one of the anti-slavery writers. His three autobiographies: *Narrative of the Life of Frederick Douglass, an American Slave, My Bondage and My Freedom*, and the third one is *Life and Times of Frederick Douglass* illustrate his bitter experiences as a slave. At the same time, these books deeply impacted the Africans in America. The autobiography was revised and republished under the title of ‘*My Bondage and my Freedom*’. He wrote many articles and essays.

Harriet Wilson (1825-1900), an indentured slave who was orphaned in youth; she published a novel named *Our Nig, or Sketches from the Life of a Free Black* (1859); it was her anonymous publication. Later in 1982, Henry Louis Gates, Jr., brought to light that this is the first African American novel. She was one of the Free Persons or People of Colour i.e. people of the African Descent who lived in colonial and antebellum America which refers to the period before the American Civil War.

The narratives of the fugitive and former slaves form the oeuvre inception of the African literature in America. They are found in the forms of fiction and autobiography:

From 1760 to the end of the Civil War in the United States, approximately 100 autobiographies of fugitive or former slaves appeared. After slavery was abolished in the United States in 1865, at least 50 former slaves wrote or dictated book-length accounts of their lives. 2

Hundreds of slaves recorded the accounts of their relentless sufferings which are the mainstay of their literary content in the forms of poems, narratives, novels, speeches, sermons, plays, articles, essays, and pamphlets.

An upsurge of violence, inequity, injustice, and racial discrimination resulted in an abrupt twist in the state of affairs. The end of the Civil War and Slavery lightened the minds of the Africans in America. The Post-slavery Era or the Era of Reconstruction (1865-1877) marks a significant landmark in the history of America in general and in African American history in particular. It was the turn of the century.

The personality of W.E.B. Du Bois (1868-1963) was an American activist, author, editor, and historian. He is rightly called the Black Protest Leader. In 1909, he caused the creation of the National Association for the Advancement of Coloured People (NAACP). *The Souls of Black Folk* is a collection of his essays; it is a gigantic milestone in the history of Black literature. The NAACP initiated the publication of a Quarterly called *The Crisis*. One of its aims was Enactment of the Civil Rights Laws and Programmes of Education and Public Information.

Booker T. Washington (1856-1915) founded Tuskegee Institute, a college for the Black in Alabama. His writings comprise of *Up from Slavery*, *The Future of the American Negro*, *Tuskegee and its People* and *My Larger Education*. His views and principles were quite antonymous to those of Du Bois. He believed in the ideology of ameliorating oneself as an African by proving oneself to be of the same traits of the White.

Paul Lawrence Dunbar (1872–1906), a poet, novelist, and short-story writer, made use of the rural dialect to express himself. His poetic work named *Oak and Ivy* and *Joggin' Erlong* give the glimpses of the rustic African Americans.

Marcus Garvey (1887–1940), a Jamaican journalist and publisher. He was given the nomenclature of 'Crusader of Black Nationalism'. He contributed profusely to the literary forms of essay and nonfiction. James Weldon Johnson writes in his 'Book of American Poetry':

Paul Laurence Dunbar stands out as the first poet from the Negro race in the United States to show a combined mastery over poetic material and poetic technique, to reveal innate literary distinction in what he wrote, and to maintain a high level of performance. He was the first to rise to a height from which he could take a perspective view of his own race. He was the first to see objectively its humour, its superstitions, its shortcomings; the first to feel sympathetically its heart-wounds, its yearnings, its aspirations, and to voice them all in a purely literary form. 3

The advent of the Harlem Renaissance (1920-1940) widened the horizons of Black form of literature. In fact, it began in the African Community in Harlem, New York. It was the outcome of the incessant efforts of the artists and musicians in the domains of Jazz, Theatre. They rose to the occasion and created novel figurative images, literary style, and pragmatic aspects of life in their linguistic register called Black Dialect.

Langston Hughes(1901–1967), a poet, playwright, novelist, and short-story writer wrote poems and published *The Weary Blues* (1926) and *Not Without Laughter* (1930), a novel. He portrayed the Black American life between 1920 and 1969. Jazz had the greatest influence on his writings, or instance *Montage of a Dream Deferred* (1951), a very long poem. One of the best collections of short stories was his *Simple Speaks his Mind*.

Other notable Black poets were Claude McKay (1890-1948), Jean Toomer (1894-1967), and Countee Cullen (1903-1946). Claude McKay wrote three novels and short stories: *Home to Harlem*, *Banjo* and *Banana Bottom* and a short story collection. Zora Neale Hurston (1891-1960), a novelist and short story writer, produced a classic novel entitled *Their Eyes Were Watching God* (1937). She wrote more than a dozen books. She was one of the finest female African American writers.

Other influential writers were Jean Toomer, Dorothy West, Countee Cullen, and Wallace Thurman. Toomer wrote '*Cane*', an anthology of poems, stories and accounts about the rural Black life. Dorothy West's novel '*The Living is Easy*' that deals with the life of an upper-class family. Countee Cullen delineated the everyday life of the Black people in his poems like his poetic anthologies of *Colour*, *Copper Sun* and *The Ballad of the Brown Girl*. Frank Marshall Davis was an acclaimed poet who wrote poetic collections like *Black Man's Verse* (1935) and *I am the American Negro* (1937). *The Blacker the Berry: A Novel of Negro Life* (1929) written by Wallace Thurman focused on the inter-racial bias between the Black and the White cultures.

1970's began the modern period of the Black genre. By then, it had established its stature in World literature. It attained the position as a legitimate genre. Literary stalwart novelists, playwrights and poets like Toni Morrison and Alice Walker, James Emanuel. And Alex Haley, Maya Angelou, Rita Dove, Cyrus Cassells, Ntozake Shange, August Wilson, Edward P. Jones, to name a few. In a nutshell, they expressed both the personal and public experiences of Black America. The writings revealed multifarious moods of melancholy, mirth, music, laughter, lamentation, sorrow and suffering. The Black genre is multidisciplinary and has its own characteristic features and a unique perspective. Ann Trent speaks about the uniqueness of Black literature:

The primary characteristic of African American literature is that it speaks to the African-American experience in the United States, a country with a history of slavery and segregation laws. Because of this focus, many literary works are about individuals struggling to understand themselves in a white-dominated society. Some African-American writers made "fringe" characters, such as criminals, tricksters and those of non-mainstream sexuality the primary protagonists in their novels. These characters highlight the marginal place of African Americans in society. Examples of novels with fringe characters are Richard Wright's novel "*Native Son*" and Alice Walker's novel "*The Colour Purple*." 4

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## CHAPTER 34

# INFLUENCE OF INNOVATION MANAGEMENT ON PERFORMANCE OF EMPLOYEES WITH SPECIAL FOCUS ON MALAPPURAM REGION

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### ABSTRACT

"Innovation Management" alludes to the cycle by which new products and business processes are created to showcase strategies and hierarchical designs. In advancement, the executives assist a business with making the most of outer and inside unique open doors and channel its inventiveness to the send-off of ground-breaking thoughts, cycles or items. According to a worker viewpoint, this examination investigates the impact of a favourable creative administration style on representatives' mentalities and execution. The review involves an organized poll for the assortment of essential information. Non-likelihood accommodation inspecting strategy was utilized to choose an example of 53 the IT area workers in Malappuram. Measurable apparatuses, for example, rate investigation, detailed examination, ANOVA, relationship and different relapses, were utilized for investigation. The review's outcomes show that while an excessively mindful development of the boarding procedure can be harmful to the endeavour, advancing the executive's arrangements are likewise essential to try not to squander assets. What is more, managers assume an essential part in cultivating inventiveness? Workers can take on a favourable to advancement attitude, which can expand their spirit, fulfilment and execution. What is more, support of development the executive's style advances a productive corporate culture, which upgrades hierarchical correspondence and joint effort, the two of which are essential to accomplishing authoritative objectives.

**KEYWORDS:** *Innovation, Innovation management, Pro-innovation, employee performance, management policy*

### INTRODUCTION

Advancement is one of the most frequently involved terms in contemporary life. Most individuals esteem advancement and accept that it is imperative for people and organizations (Demircioglu, 2017). The primary job of development in intensity is perceived. Then again, characterizing advancement is a touch more quarrelsome, especially in the scholastic domain, where exploration is vigorously weighted toward specialized development to the detriment of different kinds of development. With appropriate development strategies, the associations could defeat the boundaries of the executives' ability. This is because advancement is not a solitary segregated demonstration of organizations; instead, it is totally founded on a blend of new or changed acts that ultimately expand its intensity in the firm (Fernandes Rodrigues Alves et al., 2018). Hierarchical development is sometimes alluded to as authoritative or the executives' advancement and might be characterized as "how administrators do what they do." (Damanpour, 2014). For an appropriate operationalization of the development of the board, a careful comprehension of the ability of the executives in the association is likewise fundamental.

The advancement of the board is a term that includes developing the executives and changing the executives. It connects with improving new items, business processes, promoting methodologies, and hierarchical designs (Ganzer et al., 2017). Development the executives is an assortment of innovations that empowers administrators and workers or clients to team up on strategies and goals with a mutual perspective. The development of the board empowers a business to benefit from outer and interior prospects and apply its innovativeness to the presentation of novel thoughts, cycles, or items (Şimşit et al., 2014). Crossan and Apaydin take a comparatively wide perspective on advancement, contending that it "isn't restricted to the creation or reception, absorption, and double-dealing of a worth-added curiosity in financial and social circles; restoration and extension of items, administrations, and markets, yet additionally envelops the improvement of new assembling techniques and the foundation of new administration frameworks." (Crossan and Apaydin, 2010). Development and obstruction is thought of as one of the significant wellsprings of worker complaints.

By applying advancement the board innovations, the executives might enact and use the work power's imaginative abilities for the association's ceaseless development (Clark, 1980). Prototyping, item lifecycle, the board, an idea the executives, plan thinking, TRIZ, the stage door model, project the board, product offering arranging, and the portfolio the board are regular instruments. Each association that the administration embraces impending affects the representatives' mental agreement. The cycle might be considered a transformative reconciliation of association, innovation, and market employing iterative exercises like hunt, determination, execution, and catch (Tidd and Pavitt, 2011). While advancement is not adequate, it is a basic condition for a venture's constant presence and achievement. The labour force should be nimble to make all developments more productive since coordinated specialists are versatile and self-propelled to all changing circumstances in the association (Elanthi, 2021). Business development happens most straightforwardly through innovation advancement, problematic advancement, or social advancement. At times representatives might oppose developments and they report complaints. In any case, advancement the board is basic in driving technological and institutional development (Ignatius, 2014). Particularly at a difficult time, the advancement of the board culture and ability of executives can carry trees to the association.

A favourable to creative methodology toward development might lift the worker's feeling of confidence and contribute considerably to the association's seriousness. However, it isn't without gambles. A favourable to inventive methodology should confront the gamble of asset wastage and pooling of futile developments. There is additionally the gamble of over-energetic workers who might prompt unseen struggles for seriousness. Organizations should attempt to consolidate a superior complaint the board framework for changing such struggles. According to a worker's point of view, the review endeavours to break down the effect of a supportive of imaginative administration on the representatives' demeanour and worker execution.

## **OBJECTIVES OF THE STUDY**

- Parse the impact of innovative management on employee performance.
- To investigates areas such as the condition of current innovation management systems in businesses and the attitude of employees towards innovation management.
- To analyses the consequences faced by companies in being innovation from an employee standpoint.

## RESEARCH METHODOLOGY

This study embraced clear examination plan. The analyst gathered essential information of organization level, the executives level and human asset level of the association by embracing poll. Since the populace is endless, non-likelihood inspecting was taken. The Convenience Sampling Technique was trailed by choosing the representative in IT areas accessible to give replies to our examination. Essential information were gathered from IT representatives in Malappuram region and 53 respondents are considered as test size. Rate examination, distinct Statistics, relationship and relapse investigation are utilized for information examination.

## INTERPRETATION AND ALAYSIS MANAGEMEN AND INNOVATION

Factor	Variable	No.of Respondents	Percent	Total Percentage
Innovation management is a key for the organization	Yes	22	41.5	100.0
	No	23	43.4	
	Prefer not to answer	8	15.1	
Innovation management plays a great role in organizational development	Yes	21	39.6	100.0
	No	23	43.4	
	Prefer not to answer	9	17.0	
Do you believe that innovation improves the competitive advantageof a firm	Strongly doubt	7	13.2	100.0
	Doubt	8	15.1	
	Neutral	11	20.8	
	Believe	13	24.5	
	Strongly believe	14	26.4	

The above covers the mentality of workers towards innovation.41.5 percent of the respondents accept that advancement the board is fundamental in an association contrasted with 43.4 percent who don't and 15.1 percent who like to stay unbiased. 39.6 percent of respondents concur that advancement is fundamental for the improvement of a business, 43.4 percent deviate, and 17 percent stay impartial. 26.4 percent of respondents accept unequivocally, and 24.5 percent accept that development improves the upper hand of a firm, 20.8 percent stay unbiased and the leftover questions about the job of advancement in giving an upper hand .

## AREAS WHERE INNOVATION CAN BE IMPLIMENTED

Areas	No. of Respondents	Percent
Product	42	24.6
Process	50	29.3
Organisational	32	18.7
Marketing innovation	47	27.4
Total	171	100.0

Above table shows the regions where advancements can be applied. 24.6 percent of the workers concur that advancement can be applied on items, 29.3 percent express that development can be applied on the hierarchical/producing processes, 18.7 percent accept that authoritative advancement is conceivable and 27.4 percent express that promoting is the best region for applying advancement.

**CURRENT STATE OF INNOVATION MANAGEMENT**

Factor	Variable	No.of Respondents	Percent	Total Percentage
Is company introduce innovative management	Yes	22	41.5	100.0
	No	20	37.7	
	Not aware	11	20.8	
Current system is satisfying	Strongly disagree	10	18.9	100.0
	Disagree	9	17.0	
	Neutral	13	24.5	
	Agree	10	18.9	
	Strongly Agree	11	20.8	

The above table shows the present status of development the board in the respondent's organization. 41.5 percent of the respondents announced that their organization has carried out an advancement the board framework or strategy while 37.7 percent revealed that no such framework is followed. 20.8 percent of the respondents unequivocally concur, and 18.9 percent concur that present status of development the board causes more damage, 24.5 percent stayed unbiased, 17% dissented, and 18.9 percent firmly differ to the thought that advancement the executives frameworks cause more damage than being useful.

**EMPLOYEE ATTITUDE TO MANAGEMENT SYSTEM**

Employee attitude to management	Mean	Std. Deviation
Managements must take an innovation-oriented stance and encourage innovation	3.11	1.34
Supervisors are not open to innovative ideas	3.40	1.39
Discussion of innovative ideas is not encouraged in managerial meetings outside agenda	3.25	1.39
Non-technological innovation is not recognised as innovation at all	3.08	1.47
Innovation management is vital to filter out non-productive ideas	3.19	1.41
Innovation management policy ensures optimal allotment of company resources	3.32	1.37
Innovation management is normally hindered by bias towards favourite employees	3.25	1.40
A transparent policy for evaluation managerial innovation is vital for development	2.92	1.47
A pro-innovation organisation culture is beneficial to all stake holders in the company	2.85	1.51
Immediate supervisors are the forerunners of innovation management	3.32	1.41
Average Score	3.17	1.42

The above table records the demeanor of representatives towards advancement the board. The assessment that 'Most bosses are not open to inventive thoughts' has gotten the most noteworthy mean score of 3.40 showing a far reaching issue and an antagonistic demeanor towards developments. It is firmly trailed by the idea 'Advancement the executives strategy guarantees ideal allocation of organization assets' with a mean score of 3.32 showing that appropriately carried out development the board frameworks will guarantee ideal efficiency and use of assets. Additionally, the assessment 'Quick bosses are the heralds of advancement the executives' has gotten a mean score of 3.32 showing that the job of managers is

indispensable in advancing development, yet they are pessimistic about it. The assessment 'A supportive of advancement association culture is helpful to all partners in the organization' got the most un-mean of 2.85 demonstrating that a favorable to development approach may not be gainful constantly and the organization might need to prepare for specific traps.

**ATTITUDE OF EMPLOYEES TOWARDS INNOVATION**

Null Hypothesis (H0): There is no significant correlation between employee attitude towards innovation management with Pro-Innovation and Employee Performance

**CORRELATION**

		Employee attitude towards innovation management	Pro-Innovation and Employee Performance
Employee attitude towards innovation management	Pearson Correlation	1	0.479**
	Sig. (2-tailed)		0.000
	N	53	53

The above table shows that the Pearson Correlation(r) an incentive for representative mentality towards advancement the board with Pro-Innovation and Employee Performance is 0.479 and the critical p-esteem is come about at under 0.05 which signifies that the strength of the connection has a place major areas of strength for with relationship. Thus the outcome reasoned that there is a Strong positive critical connection between's representative demeanor towards advancement the executives with Pro-Innovation and Employee Performance.

**TOWARDS INNOVATION MANAGEMENT AND PRO-INNOVATION AND EMPLOYEE PERFORMANCE**

Null Hypothesis (H0): There is no significant relationship between the opinion towards innovation management and pro-innovation and employee performance

<b>Model Summary<sup>b</sup></b>						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin Watson	
1	.581 <sup>a</sup>	.337	.319	2.31599	1.477	
a. Predictors: (Constant), Essential to organization, Development of an enterprise, Competitive advantage of a firm						
<b>b. Dependent Variable:</b> Pro-Innovation and Employee Performance						
<b>ANOVA<sup>b</sup></b>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	403.686	3	100.921	18.815	.000 <sup>a</sup>
	Residual	793.844	49	5.364		
	Total	1197.529	52			
a. Predictors: (Constant), Essential to organization, Development of an enterprise, Competitive advantage of a firm						
<b>b. Dependent Variable:</b> Pro-Innovation and Employee Performance						

The above table uncovers that R (different connection coefficients) esteem was 0.581. It estimates the level of connection between the change towards the assessment among advancement the executives and supportive of development and worker performance. R Square (Coefficient of Determination) esteem was 0.337. It intends that around 33.7% of the variety in the assessment among advancement the executives and favorable to development and worker performance. Adjusted R-Squared esteem was 0.319. It changes the measurement in light of the quantity of free factors in the model. That is the ideal property of a decency of-fit-statistic. Durbin-Watson (DW) insights shows 1.477 demonstrate positive auto correction. F-esteem was 18.815 and p-esteem is  $<0.001$  which is huge at 5% level. Henceforth there is a huge connection between the assessment towards development the executives and favorable to advancement and worker execution.

## **FINDINGS**

Development is fundamental for an association, yet advancement of the board arrangements can here and there control the excitement for development. Most workers accept that advancement can provide the organization with the necessary upper hand over its rivals. Advancement can not exclusively be applied from item improvement to cycles, executives, and showcasing. A large portion of the organizations have advanced the board strategies set up, yet some respondents do not know about development. The executives propose that more straightforwardness is required in hierarchical approaches to advance development. While the advancement of the executives safeguards the organization from pointless dangers, inefficient speculations and inappropriate utilization of organization assets, and severe development, the board arrangements can now and again prompt the dismissal of leading-edge thoughts that hurt the organization more. Bosses are the primary degree of the board that will be presented to such development locales, and favourable to advancement starts with that. Assuming the manager has some glaring misgivings about the thought, there is less possibility that the remainder of the administration will acknowledge the thought. Bosses and directors need to follow a favourable to and inventive methodology that gives opens the door to thoughts to be assessed by the supervisory crew. Such a favourable to imaginative methodology will lift worker's confidence level, and lead to

Higher fulfilment makes a good work culture. Advancement offers an upper hand to the organization and the representative that advances the thought. This way, the support of development works on the demeanour of the representative towards the organization, thus advancing worker execution. However, it should likewise be recollected that reassuring advancement will likewise increment contest among workers and make unseen struggles rather than solid rivalry. There are major areas of strength for a huge connection between representatives' perspectives towards the development of the executives with Pro-Innovation and Employee Performance. There is a critical connection between the assessment towards the advancement of the board and support of development and worker execution. Different relapse shows that administration is all the more favorable to inventive when advancement is tracked down fundamental for the improvement of the association; however, it is additionally critical that as the upper hand of the organization increments, the executives start to take a protected position and needs to remain. in the protected circle and not to be favourable to the imagination.

## **CONCLUSION**

Advancement is crucial to any organization or association. Advancement gives an upper hand to the organizations in a profoundly forceful market. However, all developments are not attractive. Thus, organizations should follow the development of the executive's framework to avoid wastage of valuable organization assets on activities of no market esteem. Simultaneously, organizations may control

advancement by trying to be excessively careful. Organization organizations should gauge their choices concerning beneficial advancement impacts and represent the dangers. The discoveries of the review show that an over mindful development of the board strategy might be destructive to the association; however, advancement of the executive's arrangements is likewise essential to forestall wastage of assets. Likewise, managers assume a significant part in empowering development. Representatives might foster an uplifting outlook when the administration supports development, energizing them, fulfilment, and execution. A favourable to the advancement of the executives likewise makes a helpful organization culture working on authoritative correspondence and joint effort indispensable in achieving the hierarchical goals. It is additionally worth focusing on that when an organization's upper hand develops, the administration takes a safer position, liking to remain as far as possible, thus neglecting to be supportive of creativity.

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