

HERDING BEHAVIOUR, AND THE EFFECT ON INVESTMENT DECISIONS OF RETAIL INVESTORS

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ABSTRACT

Financial markets are significantly influenced by various factors like changes in economic, legal and political processes that occur in an economy. Nevertheless, the most vital factor is the investor's reaction and perception. From the investor's point of view, investment decision making process is dependent on the psychology of the investor, which can be called as investor sentiments. This research aims to report the research of individual investor's sentiments, especially herding behaviour in a historical perspective. This research paper is intended to uncover the investor's psychology in investment decision making focusing on the investor's rationality by explaining factors that affect their investment decision. This research focuses on the herding behaviour of the investor and its effect on the investment decision making of the retail investors in Ernakulam District.

Keywords: Investor, Investor Sentiments, Investment, Investment decision making, perception, retail investor

INTRODUCTION

In general, irrational behavior is considered behavioral bias. Behavioral biases are irrational beliefs about behaviors that may unconsciously influence our decision-making process. They are generally thought to be divided into two – emotional biases and cognitive biases. Both biases are usually the result of prejudice in the choice of one thing over the other. In general, cognitive prejudices include decision-making based on principles that may or may not be exact. Emotional biases usually occur spontaneously on the basis of an individual's personal feelings at the time the decision is taken. For a long time, everyone assumed that traditional finance theory was correct, because it states that investors think rationally and make conscious decisions; based on different emotional reactions or using economic models.

However, after a number of investigations, it has been noted that human decisions often depend on their nature, intuitions and habits, cognitive or emotional bias hidden deep in the back of one's mind. Individual investors are faced with more rational decision-making issues than institutional investors. (Ahamed, 2013) Small investors may not have all the relevant data for rapid and logical decision-making. People are unique creatures of financial behavior and, in different situations; they make

decisions in their own way, not just in accordance with traditional financial rules. Investment decision-making processes based on forecasting and the knowledge of market participants are becoming increasingly unrealistic in the current global financial market. The main reason for savings is to cover post-retirement expenses and also to acquire wealth. And the investment is targeted at the excess of money after meeting the individual's expenses.

In finance and economics, behavioral bias refers to a tendency to make decisions that result in rational financial decisions due to faulty cognitive reasoning or emotionally influenced reasoning. Behavioral biases can have an effect on financial market participants' behavior and decisions. By understanding behavioral bias, financial market participants may be able to moderate or adjust to bias and, as a result, improve economic outcomes. Individual investment patterns depend on various factors, such as economics, personal and emotional conditions, etc. Due to the changes in these conditions, there is also a change in individual investment patterns and decisions.

1.1 OBJECTIVES OF THE STUDY

PRIMARY OBJECTIVES:

- 1) To determine the emotional biases that affect the investors decision on various investments.

- 2) To determine the cognitive biases that affect the investors decision on various investment.

HYPOTHESIS

- Education has no impact on herding behavioral bias of individuals on investment decision.
- Occupation has no impact on loss aversion behavioral bias of individuals on investment decision.
- Age has no impact on representativeness bias of individual on investment decision.
- There is no significant relation between investment decision and heuristic behavioral bias of individuals.

SCOPE OF THE STUDY

The findings of the study may be benefitted in the following manner:

- ❖ The purpose of the project is to examine behavioral biases and their impact on the decision of small investors.
- ❖ The findings of the study are expected to assist investment advisors in understanding the impact of psychological and emotional factors on investment and in developing appropriate strategies that will help to minimize the negative impact of such influence.
- ❖ The study will help the banks and financial institutions to identify the determinants of savings of people.
- ❖ Mutual fund undertakings and other associated financial institutions should recognise behavioral biases that affect investor attitudes and investment decisions so that investors can be better informed about how to handle biases.
- ❖ The study will contribute to the overall knowledge base by enhancing existing financial studies. It will act as a reference material for future researchers and scholars who wish to advance their knowledge in behavioral finance.

METHODOLOGY OF THE STUDY

- The goal of this study is to evaluate the role of behavioral bias in

individual investors' decision-making. Both primary and secondary data were used in the analysis. The secondary data were gathered on different blogs, books and magazines. The key data were collected through a questionnaire from individual investors in KanjoorGramapanchayath in Angamaly area of Ernakulam District.

- **Universe:** For the purpose of this study the universe was individual investors in KanjoorGramapanchayath in Angamaly area of Ernakulam District.
- **Sampling technique:** The respondents were targeted by convenience sampling technique.
- **Sample size:** The study targeted 100 respondents from the population.
- **Data collection:** Data sources for this analysis are primary and secondary sources. Different sources of secondary data are primary data collected through questionnaires, magazines and newspapers, websites, etc.
- **Data analysis:** Collected data have been analyzed using SPSS-assisted analytical and statistical methods.

LIMITATIONS OF THE STUDY

- ❖ Inherent limitations of sampling.
- ❖ Area of study limited to 100 respondents from the population, so it can not actually represent the whole population.
- ❖ The data collected may vary according to the changes in the economic and personal conditions.

REVIEW OF LITERATURE

In finance and economics behavioral biases refers to the tendency of decision making that results in irrational financial decisions caused by faulty cognitive reasoning and / or reasoning influenced by emotions (Pompian, 2012).

(Demirel, 2011) studied the interaction between demographic and financial behavioral factors in investment decisions. The study was carried to find the impact of demographic factors influencing individual investors' behavior. In his study it was found that gender interacts with five financial

behavioral factors namely overreaction, herding, cognitive bias, irrational thinking, and overconfidence and the level of individual savings interacts with only four of the financial behavioral factors namely; overreaction, herding, cognitive bias and irrational thinking.

There are many factors such as investor demographic factor, investors' type and level of risk tolerance that help investor regarding investment decision making (Harikanth D, 2012). Investment decision has become very important because, the main objective of an investor is to make good decision and earn maximum profits. But some investors rely on their personal judgment while others make decisions based on education and evidence.

Representativeness Bias:

(Harikanth D, 2012) explains that when people are under the influence of the representativeness bias, events are categorized by them as being representative of a well-known class. The result of such a tendency is that probability estimates are made in a way that overemphasizes the significance of the categorization without adequate attention to the evidence about the underlying probabilities.

Availability Bias:

According to (Bighiu, 2010), the crucial and recent event attract the likelihood and influence the decision under availability bias, the investor (decision maker) trust the knowledge that is very much available than evaluate the option or alternatives.

Agrawal (2012) maintains that many a times, individuals behave irrationally and their decisions are biased. They tend to use shortcuts in arriving at decisions due to time and capacity constraints in processing of information. When faced with complicated judgments or decisions, they simplify the task by relying on heuristics or general rules of thumb.

Cognitive dissonance Bias:

As with the regret theory of cognitive bias, (L., 1957) states that there is tendency for people to take action to reduce cognitive dissonance that would not normally be considered fully rational: the person may

avoid the new information or develop contorted arguments to maintain the beliefs or assumptions (William N. Goetzmann, 2012).

Heuristic Bias:

(Syed Zulfiqar Ali Shah, 2018) defined the heuristic bias as the process by which investors find out solution for complex problems in uncertain environment by trial and error method which in turn leads to the rule of thumb.

Hindsight Bias:

According to (**Pompian, 2012**) hindsight bias occurs when people see past events as having been predictable and reasonable to expect. People tend to remember their own predictions of the future as more accurate than they actually were, because they are biased by knowledge of what has actually happened. Therefore, individuals perceive occurrences that have already happened to be reasonably predictable. Thus, individuals may overestimate the degree to which they expected an investment result, thus giving them a false sense of trust. This may cause investors to take an excessive risk, leading to future investment mistake.

Herding behavior:

Herding refers to the situation where rational people begin to behave irrationally to imitate the judgments of others while making decisions. There can be many reasons why herd behavior is exposed in different types of investors. Rational decision making is based on the logical consistency of decision making, rather than the form; therefore in decision making human emotions and intuitions play an imperative role. Simple way as rational choice is to select the preference from ranking (K Geethanjali).

Self-attribution Bias:

(Pompian, 2012) explained bias as the tendency of individuals to ascribe their successes to innate aspects such as talent or foresight, while more often blaming failures on outside influences such as bad luck. Therefore, self-attribution investors can, after a period of successful investing, believe that their success is due to their acumen as investors rather than to factors out of their control. This may lead to assuming more risk due to confidence.

(Shefrin, 2007) when people relate their success with their own abilities and skills and hold external factors or bad luck for their failure is self-attribution bias

Regret aversion Bias:

(Pompian, 2012) defined regret aversion bias as an emotional bias in which people tend to avoid making decisions that will result in action out of fear that the decision will turn out poorly. That is, people tend to avoid the pain of regret associated with bad decisions. This bias can either make a person to reluctant to sell because they fear that the position will increase in value and they will regret having sold it, or it can keep investors out of a market that has recently generated sharp losses or gains. Having experienced losses, our instincts tell us that to continue investing is not prudent.

Loss aversion Bias:

According to (Pompian, 2012) loss aversion refers to the notion that investors suffer greater disutility from a wealth loss than the utility from an equivalent wealth gain in absolute terms.

(Pompian, 2012) illustrated that in prospect theory, loss aversion occurs when people tend to strongly prefer avoiding losses as opposed to achieving gains. Aversion to losing allows individuals to keep their losers even though an investment has little or no chance of coming back. Investors may as a result hold investment in a loss position longer than justified by fundamental analysis.

Over optimism Bias:

(Lovallo, 1993) The over optimism bias can be defined as tendency of investors to adopt an inside view in lieu of the outside view that is more appropriate when making financial decision. An inside view is one that focuses on a current situation and reflects personal involvement: whereas, an outside view is an assessment of the current situation in the context of results obtained in the past situation.

Illusion of control Bias

According to (Pompian, 2012), illusion of control bias is which people tend to believe that they can control or influence outcome when, in fact they cannot. A review by the author indicated that choices, task familiarity, competition and active involvement can all

influence confidence and generate such illusion.

3.1 BEHAVIORAL BIASES

Behavioral biases are irrational beliefs are irrational for behaviors that can unconsciously influence our decision making process. They are generally considered to be split in to two sub types – cognitive biases and emotional biases. A bias is an illogical Preference or prejudice. It's a uniquely human foible, and since investors are human, they can be affected by it as well. More than a dozen kinds of prejudices have been established by psychologists, and some or all of them can cloud an investor's judgment. Bias is an irrational assumption or belief that wraps the ability to make a decision based on facts and evidence. A bias can be conscious or unconscious. They fail to absorb evidence that contradicts their assumptions when investors act upon them. Intelligent investors prevent two major types of prejudice: emotional biases and cognitive bias control can enable the investor, based on available data, to make an impartial decision.

Behavioral biases are generally considered to be split into two subtypes - emotional biases and cognitive biases. An emotional bias involves taking action based on our feelings rather than concrete facts, or letting our emotions affect our judgment. Cognitive biases are errors in our thinking that arises while procession interpreting the information that is available to us.

- **Cognitive Biases**

A cognitive bias is error in cognition that arises in a person's line of reasoning when making a decision is flawed by personal beliefs. Cognitive errors play a major role in behavioral finance theory and are studied by investors and academics alike. Cognitive biases generally involve decision making based on established concepts that may or may not be accurate.

- **Emotional biases**

Typically, emotional tendencies occur spontaneously on the basis of the individual's personal sensations, at the time a decision is made. Emotional biases are usually ingrained in the psychology of investors and can generally be harder to overcome than

cognitive biases. Emotional biases are not necessarily always errors. In some cases, an investor's emotional bias may help them to make a more protective and suitable decision for themselves. Emotional bias is caused by individual predispositions that can affect how someone makes decision. It is how an individual will frame information and make decision.

- Cognitive Dissonance

When human beings are not able to harmonize contradictory cognitions, a state of imbalance occurs; the response that arises due to such mental discomfort can be defined as cognitive dissonance. When investors realize that they have made a mistake, they experience mental conflict in such scenario, individual investors do not change their original decisions; rather they start believing that their decisions were rational.

Cognitive dissonance is the unpleasant emotion that results from believing two contradictory things at the same time. Cognitive dissonance can lead to irrational decision making as a person tries to reconcile their conflicting beliefs. In the field of psychology, cognitive dissonance occurs when a person holds two or more contradictory beliefs, ideas, or values or participates in an action that goes against one of these three, and experiences psychological stress because of that. According to this theory, when two actions or ideas are not psychologically consistent with each other, people do all in their power to change them until they become consistent.

- Herding Bias

Herd instinct also known as herding. Herd instinct in finance is the phenomenon where investors follow what they perceive other investors are doing, rather than their own analysis. In other words, in behavioral finance, herd mentality bias refers to investor's tendency to follow and copy what other investors are doing. Herd instinct is mentality that is distinguished by a lack of individual decision-making, causing people to think and behave in similar fashion to those around them. The fear of missing out a profitable investment idea is often driving force behind herd instinct.

- Hindsight Bias

Hindsight bias is a psychological phenomenon in which one overestimates how predictable an event was. Hindsight bias can lead an individual to believe that an event was more predictable than it actually was, and can result in an oversimplification in cause and effect. It plays a crucial role in behavioral economics as well. In investing hindsight bias may manifest a sense of frustration or regret at having not predicted a trend in security or the market overall. Hindsight bias can lead investors away from a more objective analysis of a company.

- Heuristic Bias

Heuristic are a subfield of cognitive psychology and behavioral science. A heuristic is a mental shortcut that allows people to solve problems and make judgments quickly and efficiently. These rule of thumb strategies shorten decision making time and allow people to function without constantly stopping to think about their next course of action. Heuristic are helpful in many situations, but they can also leads to cognitive biases. It allows thinking through the possible outcomes quickly and arriving at solution that will work for unique problem.

While heuristic can speed up our problem and the decision making process, they can introduce errors. Just because something has worked in the past does not mean that it will work again, and relying on an existing heuristic can make it difficult to see alternative solution or come up with new idea. Investors and financial professionals use a heuristic approach to speed up analysis and investment decisions. Heuristics are methods for solving problems in a quick way that delivers a result that is sufficient enough to be useful given time constraints. Heuristic can leads to poor decision making based on a limited data set, but the speed of decisions can sometimes make up for the disadvantage. Some common heuristic include the availability heuristic and representativeness heuristic.

- Availability Bias

The availability bias is the human tendency to think that examples of things that come readily to mind are more

representative than is actually the case. The psychological Phenomenon is just one of a number of cognitive biases that hamper critical thinking and, as a result, the validity of our decisions. The availability bias results from a cognitive shortcuts known as the availability heuristic, defined as the reliance on those things that we immediately think of to enable quick decisions and judgments. The reliance helps us avoid laborious fact-checking and analysis but increases the likelihood that our decisions will be flawed.

- Representativeness Bias

Representativeness heuristic is a cognitive bias which an individual categorizes a situation based on a pattern of previous experiences or beliefs about the scenario. It can be useful when trying to make a quick decision but it can also be limiting because it leads to close mindedness such as in stereotypes.

The representativeness heuristic is one heuristic that we use when making judgments. For every decision, we don't always have the time or resources to compare all the information before we make a choice, so we use heuristic to help us reach decisions quickly and efficiently. Representativeness is the extent to which an event is representative of its parent population. As such, when we rely on a representativeness heuristic, we often wrongly judge that something is more representative than it actually is.

- Optimism

The optimism bias can be defined as a tendency of investors to adopt an inside view in lieu of the outside view that is more appropriate when making financial decisions. An inside view is one that focuses on a current situation and reflects personal involvement: whereas, an outside view is an assessment of the current situation in the context of results obtained in the past situation.

Optimism bias is a cognitive bias that causes someone to believe that they themselves are less likely to experience a negative event. It is also known as unrealistic optimism or comparative optimism. Although the

optimism bias occurs for both positive events (such as believing own self to be more financially successful than others) and, negative events. Different consequences result from these two types of events: positive events often leads to feelings of wellbeing and self-esteem, while negative events leads to consequences involving more risk, such as engaging in risky behaviors and not taking precautionary measures for safety.

- Self-Attribution Bias

Self-attribution bias or self-serving attribution bias that refers to the tendency of individuals to ascribe their successes to innate aspects, such as talent or foresight, while more often blaming failures on outside influences, such as bad luck. Self attribution teaches investors to unwittingly take an inappropriate degree of financial risk and to trade too aggressively amplifying personal market volatility. Self-attribution bias often leads investors to trade more than is prudent. It leads to "hear what they want to hear". Self-attribution bias is phenomenon in which a person disregards the role of luck or external forces in their own strength and work.

- Loss Aversion Bias

In cognitive psychology and decision theory, loss aversion refers to people's tendency to prefer avoiding losses to acquiring equivalent gains. In other words, loss aversion is tendency in behavioral finance where investors are so fearful of losses that they focus on trying to avoid a loss more so than on making gains. The more one experiences losses, the more likely they are to become prone to loss aversion. What is distinguished from loss aversion from risk aversion is that the utility of monetary payoff depends on what was previously experienced or was expected to happen. Losing aversion research reveals that investors feel the pain of losing more than twice as much as they feel the joy of making a profit.

- Illusion of control Bias

Illusion of control bias is defined as the propensity of human beings to control or at least influence outcomes when, in fact, they cannot. When people are under the impression of control bias, they feel as though

they can assert more control over their environment than they can actually do. Illusion of bias in control can lead investors to trade more than prudently, to maintain under-diversified portfolios or to use restricted orders and. In fact, this prejudice leads to investor trust.

- Regret aversion Bias

Regret aversion refers to the tendency of the investor to avoid taking decisive actions due to an overhanging fear of loss in whatever course of action they select. Regret aversion can cause investors to be too conservative in their investment choice. As a result of losses in past, investors may shy away from making new bold decisions and accept only low-risk positions. This behavior can lead to long term underperformance and can endanger investment goals.

Regret aversion causes investors to anticipate and fear the pain of regret that comes with incurring a loss on forfeiting a profit. Regret theory states that people anticipate regret if they make a wrong choice, and they consider this anticipation when making decisions. Fear or regret can play a significant role in dissuading someone from taking action or motivating a person to take action.

3.2 Behavioral finance

(Sewell, 2007) constructed behavioral finance as the study of the influence of psychology on the behavior of financial practitioners and the subsequent effect on markets. Schinckus (2011) broadly define behavioral finance as to how psychology affects finance and more precisely how human behavior (by taking into account human desires and motivations) influence asset prices.

3.2 Investor's Decision

Defining the decision making ,it is said that forecasting and evaluating the existing solutions to reach a definite choice is called "decision making" .The decision of people are making relying on the level of the knowledge and their information decision making process that can be divided into three categories (certainty, uncertainty,risk). Decision making is a mental process resulting in doing or not doing an activity.It means an intention to do or not do an action, to choose an idea or a thought or to abandon doubt or

uncertainty. It also means the will or determination.

A decision maker may have neither the time nor the ability to arrive at a perfectly optimal decision. Individuals strive to make good decisions by simplifying the choices available, using a subset of the information available, and discarding some possible alternatives to choose among smaller number. They are content to accept a solution that is "good enough" rather than attempting to find the optimal answer. In doing so, they may unintentionally bias the decision making process.

3.3 Investment

An investment is an asset or item accrued with the goal of generating income or recognition. In an economic outlook, an investment is the purchase of goods that are not consumed today but are used in the future to generate wealth. In finance, an investment is a financial asset bought with the idea that the asset will provide income further or will later be sold at higher cost price for a profit. A layman normally come across the word investment when he thinks of saving a portion of his earnings by depositing it in a bank or by buying bonds or shares in the stock market in order to earn interest or dividends on his savings. He would probability make his decision to invest by considering the amount of interest or dividend he would receive in the future and the profitability of price appreciation judged either personally or based on his stock broker's advice.

In the macro economy, savings are used for investments to lead to additional capital formation and growth of income, employment and output in the economy. Most investors want to make investment in such a way that they get high returns as fast as possible without the risk of losing the principal money. This is the reason why many investors are always on the lookout for top investment plan where they can double their money in few months or year with little or no risk. However, it is fact that investment products that give high return with low risk do not exist. In reality risk and return are directly related. That is higher returns higher is the risk and vice versa.

3.4 Individual Investor

An individual investor may be defined as an individual applying or bidding for securities with a value not exceeding Rs 2 lakhs. The key goal of any investor is to minimize risk and optimize returns. This is in contrast to the speculator who is able to invest in a risky asset, expecting to make a higher profit.

another organisation. However, many individual investors do business on the basis of their emotions. The act of putting capital into a company or organization to make a

4.0 Results and Discussion

The responses were obtained from 100 respondents selected on a convenience sampling basis by using questionnaire as a research instrument. Statistical and mathematical tools were used for the analysis of data. Chi-square method was used to study the relationship between the variables. SPSS was used to analyse the data.

1. The relationship between herding behaviour and education of the individual investor decision making was analysed. The result was to reject alternative hypothesis and accept null hypothesis. IT was analysed that there exist no significant impact between herding behaviour and education of the individual investor decisions.
2. The relationship between occupation and loss aversion bias were analysed. The result was to reject the alternative hypothesis and accept null hypothesis.

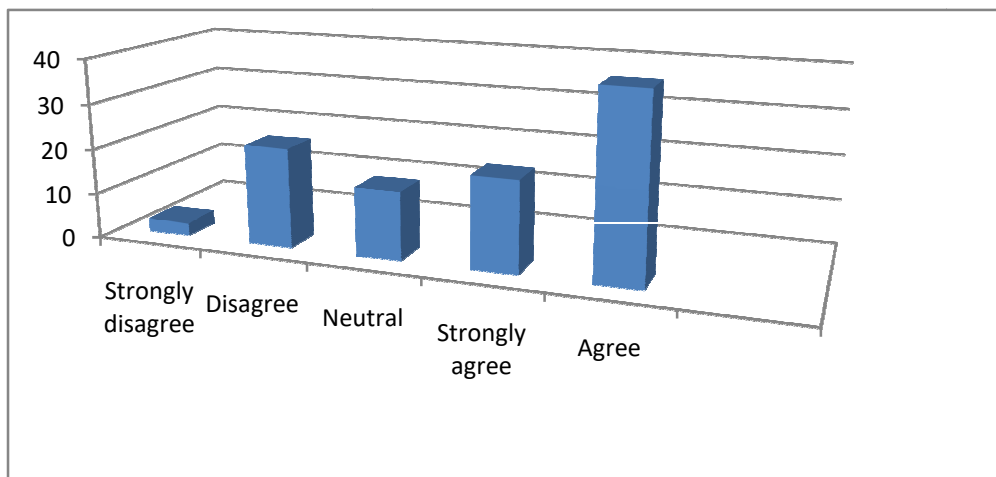
Retail or individual investor is someone who invests in shares and properties on their own, usually in smaller quantities. They normally buy stocks in round numbers, such as 25,50,75,100. The stocks they buy are part of their portfolio and do not reflect those of

profit is called investing. In the case of a small business, an investor takes the added risk of making little to no profit, because the company may or may not succeed.

It indicates that occupation has no influence on loss aversion behavioral bias of individual on investment decision.

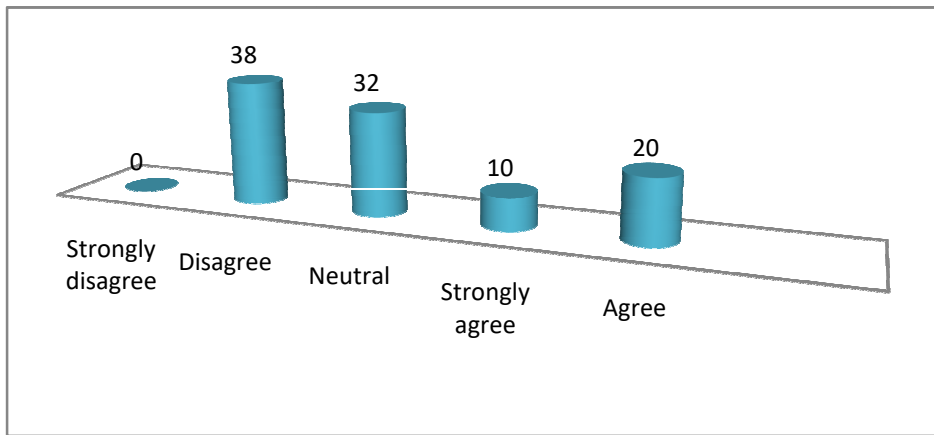
3. The relationship between age and representativeness behavioral bias of individual on investment decision was examined. The result was to accept null hypothesis and reject the alternative hypothesis and age has no impact on representativeness bias of individual on investment decision.
4. The relationship between investment decision and heuristic behavioral bias of individual was analysed. The result was to accept the null hypothesis and reject the alternative hypothesis. There is no relation between investment decision and heuristic behavioral bias of individual. Individuals have bias before making investment decision whereas they also make investment.

Fig. 4.1 representing Past history influence present investment decision



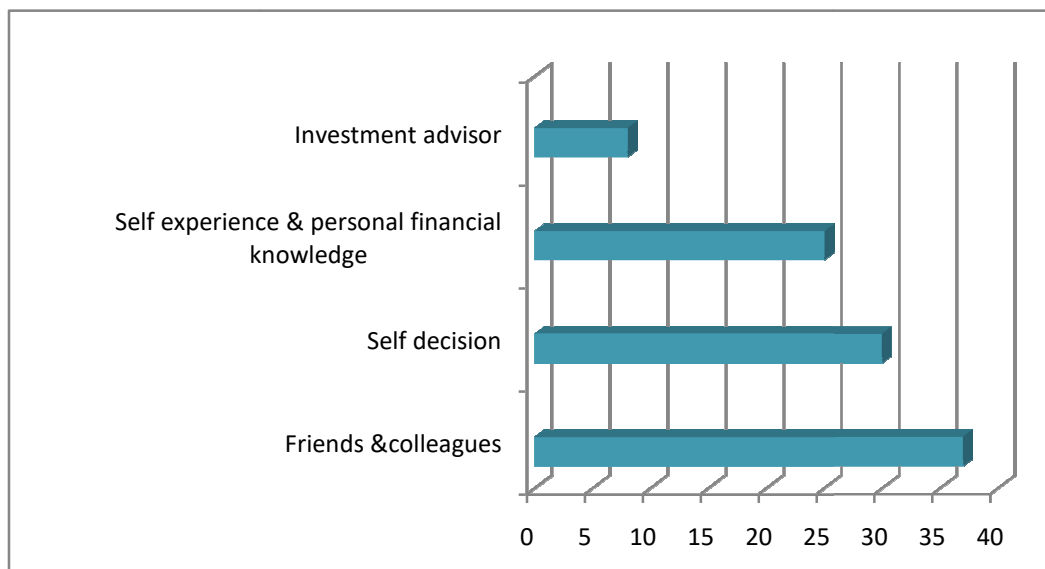
Source: Primary Data

Impact of other investor’s investment decision on my investment decision



Source: Primary Data

Fig. 4.2 representing the Factors responsible formaking investment decision



Source: Primary Data

5. The Figure 4.1 represents respondents’ response to representativeness behavioral bias and it is clear that, have an impact on investment decision. Majority of 6. The analysis indicates that ‘illusion of control biases’ has no influence on investment decision of individuals. About 37percentrespondents were

respondents (40percent) were of the opinion that, past history influence their present investment decision and 3percent were strongly disagreed about it. disagreeing about it and 30percent were as neutral. The studies found that, 53percent of respondents were agreed that they prefer to invest mostly in familiarity

- investments and none of them disagree about it. Whereas 25percent as neutral. Result of chi-square test shows investment decision has no impact on heuristic behavioral bias.
7. It has been found that loss aversion bias have no influence on investment decision of individuals. 36percent were responded as disagree, however 3percent agreed.
 8. Only a few respondents disagreed about cognitive dissonance bias impact on their investment decision.
 9. It is found that, regret aversion bias plays a role in investment decision of individual. Almost half of the respondents agreed about the impact of regret aversion on their investment decision.
 10. A study has revealed the existence of the herding behavior. The statement was not accepted by only a minority. In investment decisions, some respondents were neutral in the view of the impact of herding behaviour.
 11. It is found that individuals are not concerned about the bias of optimism. The majority of respondents (46 percent) disagreed on the role of over-optimistic bias in investment decisions.
 12. Also, it was found that investment decisions have no impact on heuristic behavioral bias of individuals.
 13. The fig. 4.2 reflects the factors responsible for making an investment decision and it is found that 37 percent were persuaded by friends and colleagues to make an investment and 30 percent by self-decision.

SUGGESTIONS

- Individuals are not more aware of cultural biases in their investment. They have prejudices before they make an investment, though they also make an investment. Awareness and knowledge in the field of behavioral bias is therefore necessary for individuals.
- To order to prevent human behavioral biases in investment decisions, financial planners and institutions

offer data and knowledge to investors so as to detect behavioral bias and to make fair and effective investment decisions without any behavioral bias.

- It is recommended that, for the benefit of financial institutions, they understand the individual's attitude towards behavioral prejudices and build various kinds of investment choices according to the needs and concerns of individuals.
- It is recommended that individuals should seek advice from financial advisors and other specialists in the field of financial management before making an investment. If they have found some personality differences in their investment decisions.

CONCLUSION

Behavioral biases are irrational beliefs for behaviors that can unconsciously influence our decision making process. From this study "role of behavioral biases in investment decisions of individuals" it is found that investment decision of individuals was influenced by several behavioral biases. The individuals were influenced by representativeness behavioral bias, as the past influence their present investment decision. Similarly individuals were affected by heuristic bias, since majority of them responded that they prefer to invest only on familiarity investment. The investment decision of individuals was also influenced by regret aversion bias and availability bias. They responded as, if loss continues in their investment, they confused to make a decision about further investment and they prefer to invest in local investment than national or international investment, because the information is more available. So the behavioral biases like; representativeness bias, heuristic bias, regret aversion bias and availability bias were influenced by the investment decision of individuals. Further, the individuals were responded as they are not influenced by the behavioral biases like; illusion of control bias, loss aversion bias, cognitive dissonance bias, herding bias, and over optimism bias.

From this study we may conclude that several behavioral biases were influence be

investment decision making of individuals and there are several factors which would not play in investment decision making.

Further study on behavioral biases can be done for the more effective understanding of this area. For the further study, it should be cover more areas and the sample size also should be more. And a detailed study undertaken on all the behavioral biases factors and which is not constraint by time factor, then it would increases the quality of

the study. A detailed study on the field of behavioral biases will contribute to the investment decision of individuals related to human psychology like their behavior influences. Study on the influence of gender on investment decision of individual on behavioral biases could be carried for the understanding of gender on investment decisions. For the further study, the geographical area could be extended.

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SURROGACY: GLOBAL MEDICAL TOURISM COMMERCIALIZATION PERSPECTIVE

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ABSTRACT

Surrogacy is traditionally accomplished through artificial insemination, in which the surrogate uses her own egg and another man's sperm. In vitro fertilisation (IVF) is a method of gestational surrogacy in which fertilised eggs from another woman are put into the surrogate's uterus. As a result, surrogacy is both a good and bad idea. On the one hand, it allows infertile couples and surrogate moms to realise their dreams of having a child and being able to better care for their families. On the other hand, there is a possibility that women will be exploited and converted into baby producers as a result of the commodification of children and parenthood. Surrogacy services are advertised, surrogates are sought, and surrogacy agencies earn handsomely. Surrogacy's commercialization raises concerns about a criminal market for babies, breeding farms, destitute women becoming baby factories, and the prospect of selective breeding for a fee. Infertile couples consider surrogate motherhood a blessing because it offers a revolutionary possibility for having a child. Surrogates in India, where surrogacy was once vilified and referred to as prostitution, sometimes had to hide their surrogacy from their extended families and communities, and they had to restate their altruistic intents and duties to avoid being labelled greedy. If reproductive work was recognised as a respectable way to make money, the stigma and instrumentalization would be reduced. A practise known as Niyogpratha existed in Ancient Hinduism, where a woman who was childless because her husband was impotent was allowed to conceive through her brother-in-law. The child was the couple's property, and the brother-in-law had no claim to it. Surrogate fatherhood was Niyogpratha. This study focuses on the joys of surrogacy, as well commercial surrogacy, which is a great option for both the commissioning couple and the surrogate mother in today scenario.

KEY WORDS. *Surrogacy, IVF, Infertility, Commercialization, Pregnancy*

INTRODUCTION

Nature has endowed women with the lovely ability to generate a life, and every woman treasures the experience of motherhood. An individual's right to reproduce is an inalienable right. Couples' desire to have children is a worldwide occurrence. Parenthood is an unforgettable and life-changing event. The anguish and sadness of not being able to fulfil one's childhood desire of being a father is overwhelming. Children have been regarded as a need for the continuance of the family lineage and a source of happiness for the parents since ancient times. According to psychologists, the birth of a child builds a relationship between spouses that might help strained marriages survive in the long run. The absence of a kid is viewed as a personal embarrassment by the family. There are numerous cases where inability is a factor. According to a WHO report, the global incidence of infertility, which includes India, is roughly 10-15%.¹ Some forms of infertility that were once thought to be incurable now

have easy treatments. Adoption was previously the sole choice for childless couples. Medical science has progressed, especially in the field of artificial human reproductive technologies (ART).² Surrogacy is a type of reproduction in which a woman decides to become pregnant and give birth to a child on behalf of another person. Surrogate is a term that implies "substitute." Surrogacy agreements are made not just within the family, but also within the neighbourhood, state, country, and world.³ There are two types of surrogacy now in use: "conventional" and "gestational" Surrogacy has become a popular option for couples and individuals who want to have a biologically related kid⁴. The notion of surrogacy is well-known around the world. Surrogacy is a more successful concept in metropolitan areas than other infertility treatments.⁵

SURROGACY'S BACKGROUND

Surrogacy is not a novel concept. It's an age-old custom. Two thousand years before the birth of Christ, the first surrogate mother is thought to have resided near the city of Hebron in the province of Canaan. Sarah, Abraham's infertile wife, persuades her maid Hager to bear a child for her. Abraham is going to bed with her. At the moment, Abraham was 86 years old. Despite his advanced age, he was able to conceive a child. Hager gave birth to a boy named Ishmael around 1910 BC. Ishmael was the first kid delivered through a so-called traditional surrogacy programme in history.

In the middle of the XVIII century BC, a second surrogacy programme was carried out in Summer Mesopotamia. Rachel, Jack's wife. Artificial insemination using the husband's or a selected donor's sperm has been routinely used in infertility treatment since 1920. Louise Brown, the world's first IVF baby, was born on July 25, 1978, in the United Kingdom, thanks to the efforts of Dr. Robert G. Edwards and Dr. Patrick Steptoe. Kanupriya, aka Durga, the world's second and India's first IVF baby, was born 67 days later on October 3, 1978.

SURROGACY IN INDIAN HISTORY

Surrogacy is also depicted in Hindu mythology, reflecting the mystery that still surrounds the practise. Vishnu heard Vasude's petitions begging Kansa not to slaughter all sons being born in the Bhagavata Purana. When Vishnu heard these requests, he had an embryo from Devaki's womb transferred to Rohini, Vasudev's second wife. Balaram, Krishna's younger brother, was born to Rohini. As a result, the 100 Kauravas became born. Similarly, Maharishi Bhardwaj saw a celestial nymph emerge from the water after a bath, and seeing such a gorgeous woman, he felt discernment and deposited his sperm in the Darona pot used for yagna. This is where Dronacharya was born, and he was given the name Dronacharya after the ship. Mahavira, the 24th Trithankar, was born thousands of years after the biblical events in 599 AD.

HISTORICAL

INDIA'S COMMERCIALIZATION OF SURROGACY

It's difficult to envisage a youngster as a consumer. After all, babies are the result of love, not money, and are conceived far from any commercial activity. Poor parents have viewed their children as potential economic assets throughout history, comparing their future economic contribution in the rice field, industry, or manor against the costs of raising them.⁶

Commercial surrogacy, also known as "wombs for rent," is a burgeoning industry in India. The prevalence of surrogacy arrangements in India has been dubbed "baby booming business," "womb on hire," "baby firm," and "parenthood by proxy" by critics.⁸ Surrogacy has transformed a woman's body's regular biological function into a business contract. Surrogacy services are promoted, surrogates are recruited, and a surrogacy agency is established. Further also in terms of hiring and retaining Indian women as surrogates. Patients pay between \$10,000 to \$28,000 for the entire package, which includes fertilisation, the surrogate's fee, and hospital delivery of the kid. The total cost, including flight tickets, medical procedures, and hotel stay. Due to the availability of poor Indian surrogate mothers at considerably reduced costs, childless couples from all over the world are flocking to India in quest of surrogate mothers. Several American, Russian, and British women have signed up for the surgery at the Akankshya Clinic in Anand and the Bhopal Test Tube Baby Centre. Surrogacy contracts are typically drawn up in a haphazard manner. Surrogacy fees range from INR 1,00,000 to 3,50,000.

This charge varies depending on the city, IVF clinic, and third-party involved (recruitment agents). Surrogates must be "healthy," married, and have at least one kid to qualify. They must also be "mature enough" to understand and handle the surrogacy process. Parents have the ability to make specific demands. For example, an Israeli couple does not want to marry a Muslim woman. Some couples wish to get married. The cost of IVF is approximately INR 66,000. The cost of an egg donor is INR 1,80,000, the cost of twins is INR 1,35,000,

and the cost of surrogate meals is up to 20,000. Extra expenses, such as spa packages, Agra excursions, airport pickup, and drop charges, are also included.

The cost of an IVF procedure is INR 66,000.

Up to four embryo transfer attempts are included in certain IVF programmes. To ensure pregnancy, a surrogate could be implanted with 3-4 embryos.

c. Indian Egg Donor INR 1,80,000 Extra-qualified, postgraduate, fertile, fair-skinned egg donors can charge up to Rs. 50,000.

d. Egg Donor (Blonde Blue-Eyed): add INR 1,80,000 for donors flown in from foreign countries.

Food costs between INR 2,000 and 3000. This varies from city to city. Some surrogates claim to be paid as little as INR 2,000. Some parents send gifts for the surrogate, such as clothing for her children, religious texts, and songs, as well as any other financial assistance.

g. Other options include spa packages, Agra tours, and airport pick-up and drop-off.”

The Indian government outlawed same-sex and single couples from using the services in 2012. This was done on the basis of moral principles that are homophobic.

Surrogates from India, for example, would be relocated to Thailand or Nepal, where gay couples face no restrictions. In 2016, in response to exploitation scandals, India enacted The Surrogacy Regulation Bill, which outlawed commercial surrogacy. Surrogacy can only be done altruistically under the current law, and only heterosexual Indian couples who have been married for 5 years and close relatives are eligible. (Public Relations Society of America, 2018) We can deduce from the 2012 limitation that criminals are involved.⁷

SURROGACY-RELATED ETHICAL AND MORAL CONCERNS

1. Harm to Surrogate Moms- Due to poverty or other financial constraints, most Indian women become surrogate mothers. Surrogacy technology, on the other hand, may bring issues and injury to the surrogate mother's health and life. This raises the fundamental question of who is responsible for the harm a surrogate mother causes or suffers. If there

isn't any evidence of medical malpractice on the side of the doctors.

2. Kid's Best Interests- Surrogacy usually entails paying a fee to the surrogate mother in exchange for her delivering and giving over the child to the commissioning parents. As a result, it has been compared to buying and selling a child. It is claimed that this would lead to the selection of a child's sex and features, resulting in the development of designer babies. Surrogacy with in vitro fertilisation frequently leads in the delivery of triplets or quadruplets, according to studies. This may be detrimental to the child's interests, as the commissioning parents may not be able to care for a large number of children born against their will. Surrogate children may also be born with abnormalities.⁸

3. Surrogacy Degrades Women's Dignity- The right to dignity is one of every human being's inherent and cherished rights. Surrogacy is said to be degrading to a woman's inherent dignity. Surrogacy is the practise of using a woman's body to produce a child for the commissioning parents. During the pregnancy, the surrogate mother must adhere to the requirements set forth. As a result, the natural mother-child attachment is either nonexistent or muted, and the whole thing is perceived as a business transaction. Critics believe that the body of a woman is reduced to that of an incubator or breeder machine, lowering her dignity

4. Surrogacy has been compared to prostitution- Many authors have compared surrogacy to prostitution because it involves the sale of a woman's reproductive capacity and the exploitation of her body for monetary gain. Furthermore, it is said that, similar to a prostitute who has no choice and control in front of a customer who has asked for her help and paid money, the surrogate mother has no choice and control in front of a customer who has asked for her help and paid money.

5. Surrogacy has been compared to the exploitation of poor women in India, where women with low financial resources have quickly embraced this strategy of making quick money and meeting family

requirements. As a result of the availability of low-cost surrogate moms and world-class medical treatment, India has risen to the top as a surrogacy outsourcing destination. As a result, the youngster suffers.

6. Surrogacy Assumes God's Role- Traditionally, a child is seen as a gift from God. The act of procreation was also regarded as a religious commitment that spouses must fulfil in order to have a child. Prior to the evolution of medical science, the childless couple's only options were to adopt a child or accept their childlessness as a divine choice

7. Attachment to the Gestational Mother — The gestational mother is the woman who brings the baby to term in a surrogacy circumstance. This can be a physically and emotionally draining process, especially because after physically carrying the baby during the pregnancy, the surrogate mother must physically and emotionally divorce herself from the kid once it is born.

8. Role with the Gestational Mother - Because the gestational mother is unlikely to be the kid's primary caregiver, legal problems about what, if any, involvement she will have with the child after birth may arise. Other ethical concerns around surrogacy include: To what extent is it appropriate for society to allow women to form contracts over the use of their bodies. Surrogacy is legal in India, however it is neither prohibited nor completely regulated. Surrogacy is currently unregulated in India due to a lack of legislation. It is regarded enforceable and fully legitimate because it is not expressly declared unenforceable by law. After years of debate and discussion, especially among the ICMR, the National Academy of Medical Sciences, and ART practitioners, the Minis has been released. The Indian Law Commission, in its 228th Report, explains why surrogacy laws are necessary. Despite its efforts to regulate surrogacy, the ART Bill has been criticised by a large number of academics who argue that it favours the interests of the medical-business lobby and does not adequately protect the rights of surrogate mothers and children.⁹

While some of these are positive changes, the Draft in its current form is far from comprehensive. These flaws must be

addressed if the proposed legislation is to successfully control India's rapidly growing ART and surrogacy industries. According to the New Indian Medical Visa Regulations of 2012, only legally married men and women who have been married for at least one year are eligible to apply.¹⁰ No woman under the age of 21 or above the age of 35 can operate as a surrogate mother, according to the Assisted

Reproductive Technology (Regulation) Bill, 2013. For the first time, the bill specifies requirements for international couples wishing to hire surrogates in India. According to the 2013 draught, surrogacy pay shall be negotiated privately between the surrogate mother and the commissioning agency.¹¹

SURROGACY-RELATED LEGAL CONCERNS

1. Surrogacy Access – The right to reproduce is a fundamental human right. However, with the increased use of technology, the question of whether surrogacy may be used as a right and who can use it arises. Surrogacy has traditionally been viewed as the final resort for married infertile couples seeking to have a child. However, the usage of surrogates has become a point of contention.¹²

2. Validity of Surrogate Contracts- Surrogacy law is ambiguous and undefined. Surrogacy contracts are widely criticised in India as being anti-public.¹³

3. The Right of a Kid to Know His Origin- Article 7(1) of the Convention on the Rights of the Child (CRC) of 1992 emphasises that a child has the right to know his or her origin. This means that the authorities must keep accurate documents about the child's origin. Doctors, hospitals, and parents all have a responsibility to deliver critical information as needed¹⁴

3. The Right of a Kid to Know His Origin- Article 7(1) of the Convention on the Rights of the Child (CRC) of 1992 emphasises that a child has the right to know his or her origin. This means that the authorities must keep accurate documents about the child's origin. Doctors, hospitals, and parents all have a responsibility to deliver critical information as needed. Domestic laws should not be amended to allow commercial surrogacy in jurisdictions that currently prohibit it due to

ethical issues generated by people who have participated in global surrogacy arrangements (sometimes against the law of their own jurisdiction). Courts should deal with such matters on a case-by-case basis, or the legislature should decide what should be done.¹⁵

REFORMS IN THE LAW COMMISSION OF INDIA'S 228TH REPORT

Many major points are recommended in the Law Commission of India's 228th report, as follows: Surrogacy should be done under the parameters of a contract that includes all of the requirements, such as the surrogate mothers and family members' approval that she can bear the child, the surrogate mothers and family members' financial and medical expenses, and the child's legal status. If the commissioning parents die or if any other event occurs, financial plans for the child born through surrogacy should be made. Individual who was responsible for the child's birth, or the couple's divorce or nobody wants to adopt the youngster. Because there will be a genetic relationship between parents and child, which will be fruitful, one of the commissioning parents should also be a donor. This will help to reduce the child abuse that is seen in many cases. The surrogate child should be the commissioning parents' legal child without the need for guardianship or adoption. Our legislature should acknowledge this type of provision. On the birth certificate of the surrogate kid, the commissioning parents' names should be stamped. There should be no breach of the donor's as well as the surrogate mother's right to privacy. The practise of sex-selective surrogacy should be prohibited. Medical Termination of Pregnancy should be the only law that governs abortion situations. Act of 1971

PRESENT LAWS

In France, Article 17/6 of the Civil Code renders any agreement with a third party about pregnancy null and void. The highest court in France, the Court de Cassation, ruled in a case that providing agreements for international surrogacy will be, overturned on the decision of the French Consulate in India, which was not in accordance with the law.

Human Rights and Surrogacy There are many diverse points of view on human rights in relation to surrogacy. Many individuals view it positively, but others view it negatively and see it as a violation of human rights. Reproductive rights are a relatively new concept in international law. The first document on this topic was agreed during the Teheran Conference on Human Rights.

Today, innovative procedures such as ICSI (intracytoplasmic sperm injection) are becoming more popular. Surrogacy arrangements between infertile couples and surrogate mothers have gained public attention and interest as a result of in vitro fertilisation (IVF) and intra uterine insemination (IUI). Surrogacy medical tourism is currently centred in India. High-quality health care, erudite and western-trained doctors, and low medical costs are some of the factors that draw foreign visitors to India. Surrogacy also creates a number of issues, including heritage, parenthood, and legal status.¹⁶

Surrogate motherhood is defined as "an arrangement between a married couple who are unable to have a child due to the wife's infertility and a fertile woman who agrees to conceive the husband's child through artificial insemination, carry the child to term, and then relinquish all parental rights in the child." Surrogacy is a technique in which a surrogate rents her womb to a couple for the purpose of having their kid. Traditional, gestational, and donor surrogacy are the two types of surrogacy based on the managements utilised to have a baby. The surrogate mother egg is used in traditional surrogacy, making her genetic mother. The egg is provided by the intended mother or a donor in gestational surrogacy.¹⁷ In vitro fertilisation (IVF) is used to fertilise the egg, which is then implanted into the surrogate mother. In vitro fertilisation (IVF) is used to fertilise the egg, which is then implanted into the surrogate mother. There is no biological link between the child and the surrogate in this case. Surrogacy can alternatively be classified as commercial or altruistic, depending on whether or not the surrogate receives financial compensation for her pregnancy or the child's relinquishment. The gestational

carrier (surrogate mother) is paid to carry a child for the intending parents in her womb in commercial surrogacy. The surrogate does not get money for her services in altruistic surrogacy, but she does receive reimbursement for medical fees and other reasonable pregnancy-related expenses. Medical tourism has becoming increasingly popular in India.¹⁸ Surrogacy has now become a global market as a result of medical technologies used by various hospitals and multinational firms such as cryos international sperm and egg bank cryos Denmark. However, there are several hospitals that have been doing surrogacy for a long time, including Dr. Padmaja Fertility Centre Hyderabad, Dr. Jilla Hospital Aurangabad, Jaslok Hospital Mumbai, and other hospital'

MEANING & CONCEPT OF SURROGACY

The word surrogate comes from the Latin word "surrogatus," which means "a substitute," or "someone assigned to act on behalf of another."¹⁹

DEFINITIONS OF SURROGACY

Surrogacy is a medical term that refers to the use of a surrogate mother in place of the natural mother. Surrogacy, according to American Law Reports, is a contractual agreement in which the natural or surrogate mother agrees to conceive a child through artificial insemination with the natural father's sperm, to bear and deliver the child to the natural father, and to relinquish all parental rights following the child's birth in exchange for a fee.

TYPES OF SURROGACY

There are three types of surrogacy.

- i) Total Surrogacy/Gestational Surrogacy
- ii) Genetic Surrogacy/Partial Surrogacy
- iii) Total Surrogacy/Gestational Surrogacy

In genetic/partial surrogacy, a woman's egg is fertilised by the sperm of the male partner of the couple desiring the child (commissioning father) through artificial insemination or, less frequently, natural intercourse. The surrogate mother is the child's genetic mother, while the commissioning mother serves as the child's social and legal mother.

Total surrogacy is when the surrogate mother takes over the role of the biological mother.

The egg and semen are collected from the commissioning couple (or anonymous donors) in gestatory/gestational surrogacy, and the resulting embryo is then implanted into the surrogate or carrying mother. The surrogate mother has no genetic link with the kid. Full surrogacy is the name given to this form of surrogacy.

Financial compensation is not provided to the surrogate mother in altruistic surrogacy, while the commissioning parent may provide expenses and costs to the surrogate mother in bringing the embryo to term. This sort of surrogacy is widespread among relatives or friends.

MEDICAL TOURISM AND A SURROGACY HUB

People from less developed countries used to go to developed countries for medical treatment due to a lack of medical and technical know-how, as well as infrastructure issues. Canadians travel to the United States for treatments that are not covered by the Canadian health-care system, Americans visit Mexico for normal check-ups, and Japanese sniff our urine.

THE RISE OF REPRODUCTIVE TOURISM IN INDIA

Jaswant Singh, India's finance minister, called for India to "become a worldwide health destination" and urged the government to take steps to aid the medical tourism business, such as improving airport facilities. The World Trade Organization's General Agreement on Trade in Services (GATS) covered trade in medical services, allowing private hospitals treating foreign patients to receive reimbursement.

INDIAN CLINICS PERFORMING SURROGACY FOR INTERNATIONAL COMMISSIONING PARTIES

Surrogacy for international clients has taken place in India's major cities, including Kolkata, Pune, New Delhi, Bhopal, and Indore. The Akanksha Infertility Clinic, which is run by Dr. Nayna Patel and is based in Anand, Gujarat, is a well-known surrogacy clinic. Several ladies from the United States, Russia, and the United Kingdom have registered with the Akankshya Clinic in Anand and Bhopal.

THE LEGAL STATUS OF SURROGACY

The constitution of India and the Indian Contract Act 1872 can be used to determine the enforceability of surrogacy agreements in India. The non-binding ICMR rules and the Assisted Reproductive Technology (Regulation) Bill 2010 may also be scrutinised.

INDIAN CONSTITUTION

Basic Rights Article 21 of Part III of the Indian Constitution is considered as the cornerstone and core of the fundamental rights.

Maneka Gandhi V. Union of India²⁰The Supreme Court has expanded the reach of the Article, making it a source of many rights today. The current article covers a wide range of topics, including the right to a dignified existence, the right to a good quality of life, the right to shelter, the right to medical assistance, the right to a livelihood, the right to a healthy environment, the right to clean air and water, and so on.

Kharak Singh v. State of U.P.²¹ In a minority decision, the court stated that the right to privacy is an integral component of the right to personal liberty. Further, in the matter of R. Rajgopal vs. Tamil Nadu State, The right to privacy is implied in article 21, according to the court.

The American decision Roe v. Wade established that the right to procreate is implicit in the right to privacy. In the case of **Skinner v. Oklahoma**.²²The freedom to reproduce is one of man's core civil rights, according to the American Court.

INDIAN CONTRACT ACT, 1872

The parameters of a valid contract are defined in Section 10 of the Indian Contract Act. In order for a contract to be valid, the following conditions must be met.²³

- a) There must be an agreement, which must be the outcome of one party's proposition and the other's acceptance.
- b) The parties must be competent to enter into the agreement and make the contract.
- c) Legal consideration is required.

COMMERCIAL SURROGACY AGREEMENTS & INCONSISTENCY WITH THE ESSENTIALS OF VALID LEGAL CONTRACT

The legal legitimacy of a surrogacy contract has been called into doubt due to its failure to comply with the essentials of a legally valid contract as defined by the Indian Contract Act. Surrogacy agreements are described as contracts under the ART Bill, although the essential legal requirements for an arrangement to be deemed a contract, namely the parties' voluntary consent as stated under the Indian Contract Act, are not met. The parties lack consensus ad idem, or agreement between the parties on the same item in the same sense, or a meeting of the minds of the parties on the understanding and performance of the agreement, due to the surrogate mother's lack of informed consent. This is considered one of the most important requirements for the legal legitimacy and enforceability of a surrogacy contract. Second, there's unpredictability. The surrogate mother mainly originates from poor marginalised portions of society who are illiterate, poor, frequently living below the poverty line, unemployed or petty wage earners, unable to find productive jobs, whereas the intending spouses are from the wealthier section of society.

NON APPLICABILITY OF CONTRACTUAL LEGAL REMEDIES

The Indian Contract Act, 1872, is intended to govern the surrogacy arrangement, but there is a substantial limitation in the applicability of contractual remedies for breach of contract to the surrogacy agreement. The Indian Contract Act²⁶ lists the consequences and remedies for breach of contract, including compensation for loss or damage caused by the violation.

INCONSISTENCY WITH INDIAN EVIDENCE ACT 1872

Parentage is vested in the intending couple who commissions surrogacy and uses the services of a surrogate mother after making the requisite payment⁴⁷, according to the ART Bill. The bill also specifies the couple's names should be listed as legal parents on the birth certificate. issued to the surrogate kid, with the surrogate mother excluded. The surrogate mother has a legal obligation to quickly hand up custody and guardianship of the kid to the couple following birth. In accordance with this, the

surrogacy agreement's provisions are written in such a way that the intended couple's parental rights are clearly stated.²⁴The relevant clause of the Indian Evidence Act establishes the child's parentage and establishes the presumption of legality of birth for all legal purposes under Indian law. In simple terms, this law indicates that "a child born during the continuation of a marriage, the spouse of the woman giving birth is believed to be the kid's father." Women who give birth must abide by this law.

As a result, the surrogate mother and her husband may be legally presumed to be the surrogate child's legal mother and father, and legal paternity may be vested in them. In a similar vein, the Birth Registration Act 51 recognises the birthing mother as a "natural mother" or "natural parent." However, contrary to popular belief, the ART Bill's relevant section specifies that As a result, they are diametrically opposed. These complicated issues surrounding parentage determination arose in the case of German surrogate twins whose biological father was German but who were born to an Indian surrogate mother in Anand, Gujarat, in Jan Balaz, where the Gujarat High Court held the surrogate mother as one of the parents based on the legal presumption established under the Indigenization Act. "In the absence of any legislation to the contrary, we are more inclined to recognise the gestational surrogate who has carried the embryo for the full 10 months in her womb, nurtured the babies through the umbilical cord, and given birth to the child as the natural mother, as legal mother," the Gujarat High Court concluded.

SURROGACY AS LABOR

Surrogates could be considered as temporary guardians or healthcare workers rather than dehumanised incubators. Surrogacy has an ethical component as well, which is why it is appropriate to consider it a profession. Regulatory authorities that monitor surrogacy, similar to those that oversee other professions, might then offer protections.

CHALLENGES POSED

The following are some of the obstacles that come with surrogacy.

1) Parentage.

2) Citizenship.

3) Economy.

4) Remedies for Breach of Contract.

5) Bill.

PARENTAGE

The medical officer or a hospital or health centre designee is responsible for informing the registrar about births that occur in their facility under the Registration of Births and Deaths Act. In this case, the petitioner, Jan Balaz, a German resident, and his wife Susanne Anna Lohle, entered a surrogacy for the child's birth certificate.

CITIZENSHIP

In the landmark case, In **Baby Manji Yamada v. Union of India**²⁵ the Supreme Court of India formally allowed commercial surrogacy. In this case a Japanese couple sought the help of surrogacy and an Indian surrogate mother to give birth to a child. However during the time of pregnancy the Japanese couple was divorced and the intended mother refused to take the child. Fortunately the father and grandmother of the children were willing to tackle care of the child and possible confusion could be averted. The court could not invalidate the surrogacy practice and surrogacy contract and in fact tried to solve the main issue. Therefore it can be held that such practices and contracts are valid in India.

In **Jan balaz v. Anand Municipality**²⁶ The Gujarat high court declared that child born in India by surrogacy to an Indian mother is an Indian citizen and directed the passport authorities to issue the Indian passport.

CONTRACTUAL REMEDIES

Although a surrogacy agreement may be legally protected, it is uncertain if damages or specific performance may be possible in the event of a breach by one of the parties.

The Surrogacy (Regulation) Bill, 2016.²⁷

The major objectives of this bill is to provide altruistic surrogacy to the needy infertile couples, to prohibit commercial surrogacy including sale and purchase of human embryos and gametes, to prevent the commercialization of surrogacy, to prohibit the potential exploitation of surrogate mothers and protects the right of children born through surrogacy.

The Surrogacy (Regulation) Bill, 2019.²⁸

The Surrogacy (Regulation) Bill, 2019 was passed by Lok Sabha on August 5, 2019. The Rajyasabha in its meeting held on Nov 21, 2019.

SUGGESTIONS & CONCLUSION

Every country considering legalising commercial surrogacy should follow Israel's lead, since it has successfully balanced societal and private-sector needs.

- Before consenting to and signing a contract, both the surrogate and the infertile couple should get legal advice.
- Surrogate relationship disclosure should be kept to a minimum to minimise unwanted attention.

To protect the rights of women and children, laws should be drafted and executed to address the grey areas.

- In India, a special legislation for the regulation and control of surrogacy is urgently needed.

It should consider problems such as surrogacy access, liability issues, the child's best interests, parentage, and so on. The terms and conditions must be written clearly and concisely.

It is past time for the Indian Parliament to study the international perspectives on surrogacy in general and the position that prevailed in India in particular in order to gain a better understanding of the situation and to provide a comprehensive set of rules and regulations for our own country, taking into account societal feelings and acceptance of surrogacy. Why India must prioritise the legalisation of charitable acts.

In view of the legal concerns surrounding surrogacy commercialization and financial contracts, the first and most basic advice is to rephrase the term commercial and replace it with paid surrogacy arrangement as soon as possible with law and policymakers. Surrogacy contracts that provide for reimbursement and reinstatement of parental rights are referred to as paid surrogacy.

Though the ART Bill provides for the agreement, there are numerous gaps that pose a slew of legal issues that must be addressed immediately. The Government of India, Law Commission Report (No. 228, August 2009), recommends that certain safeguards be

incorporated in order to improve the legislation governing surrogacy agreements. The commission proposes that it be included. Incorporation of the Indian Society for Third-Party Assisted Reproduction (INSTAR91) Guidelines is another important recommendation.

These are guidelines created by a group of self-aware and motivated doctors, attorneys, and professionals whose primary goal is to defend surrogate mothers' interests. For the first time, the suggestions included a set amount of compensation. It may also be urged that, while the ART Bill is pending as a statutory legislation, the Women's, Child Commission and the relevant Women's and Child Ministry study the Bill and propose steps to better protect the rights and interests of surrogate mothers. It should be noted that the Supreme Court mentioned the involvement in the Baby Manji case. Another neglected concern in the ART Bill is the legal advice supplied to surrogate mothers.

It is advised that legal counselling be provided to surrogate mothers, as this aids surrogate mothers in generating better informed consent and making better decisions. The ART Bill could include a provision to this effect. It should be emphasised that these ideas are not exhaustive. To ensure a healthy life, both the surrogate mother and the child must have health insurance. Surrogacy clinics, which demand arbitrary costs for surrogacy arrangements, ought to be monitored by the government. The government would be able to enforce regulations to ensure that clinics charge reasonable fees. Under the Ministry's ART section, a proper Monitoring Committee should be constituted.

The state government should investigate poverty reduction plans and programmes, particularly in and around the areas where surrogate mothers dwell. The state government should push job creation initiatives and programmes throughout the state. Those enclaves populated by surrogate moms. As far as the ICMR guidelines are concerned, a right-based legal framework for surrogate mothers is required. Surrogacy clinics, which demand arbitrary costs for surrogacy arrangements, ought to be

monitored by the government. The government would be able to enforce regulations to ensure that clinics charge reasonable fees. The commissioning parents' and surrogate mother's contract should include language about insurance and emergency needs that the surrogate mother may have during the pregnancy. It satisfies the couples' desire to complete their family. It is a fantastic alternative for ladies who are unable to conceive owing to a variety of factors/reasons. It is the most recent weapon in the fight against infertility. It has the DNA of the intended parents; therefore there is a genetic link.

Surrogacy is purely contractual understanding between the parties hence care has to be taken while drafting agreements so that it does not violate any of the law like particulars of the surrogate, type of surrogacy, mentioning about paternity in the agreement, creation of the registry for biological father of the children agreement in an adoption cases, genetic testing to determine paternity, unexpected mishappening to the surrogate mother, child custody regarding jurisdiction for the dispute arising out of agreement. surrogate motherhood by unmarried woman may be prohibited.

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- The Andhra Pradesh Court concluded in the B. K. Parasarathi case that "the right to make a decision regarding reproduction is primarily a very personal decision either on the side of the father or on the part of the mother."
23. The Indian Contract Act, 1872 (Act 9 of 1872),ss.23, 30.
- There are various agreements which have been expressly declared to be void under Indian contract act. These are as follows
- 1) Agreement which do not have a lawful consideration or object, SS. 23, 24.
- 2) Agreement without consideration ,S. 25.
- 3) Agreement to do an impossible act , S. 56.

- 4) Agreement in restraint of marriage , S. 26.
- 5) Agreement in restraint of trade , S. 27.
- 6) Agreement in restraint of local proceedings ,S. 28.
- 7) Agreement which is ambiguous and uncertain , S. 29.
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DO CASH CONVERSION CYCLE IMPACT FIRMS' PERFORMANCE? A RESEARCH IN INDIAN DAIRY SECTOR

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ABSTRACT

Purpose - To know the effect of cash conversion cycle and their components on profitability of dairy firms in India.

Design/Methodology - The study considers all the listed firms of dairy sector in Bombay stock exchange(BSE) of India. The sample has been taken of 10 listed firms of dairy sector in BSE for the period 31st march 2010 to 31st march 2020. Novel estimation technique of Hausman test and panel fixed effect regression is used for the purpose of the analysis.

Findings - The findings reveal that working capital and its various components have significant influence over the profitability of dairy firms in India. Further, the impact of Cash conversion cycle and receivables management are significantly negatively impacting the net profit margin of firms implying that firms in dairy sector can increase profit margin by reducing the cash conversion period.

Research limitation - The study considers the listed firms of dairy sector in India but it is only confined to 10 listed firms of BSE (Bombay Stock Exchange). The data for the period 31st March 2010 to 31st March 2020 has only been considered.

Research recommendation - The findings have important policy implications such as, the government should focus on providing sufficient liquidity funds to the dairy firms in India by adopting more financial inclusiveness policies. The dairy sector which is not so developed in a developing economy like India needs to be developed by adopting development policies.

Keywords: Cash Conversion cycle, performance, dairy sector, panel analysis

1. Introduction

Working capital management is a significant component of financial management which facilitates the decision-making concerning current assets and current liabilities (Mansoori and Datin, 2012; Sharma and Kumar, 2011; Deloof, 2003). Some business firms make excessive investment in working capital and then they have to be cautious regarding the level of inventory cash receivables and payables because working capital highly affects the profitability as well as the liquidity in the enterprise (Karaduman *et al.* 2011; Gill *et al.* 2010; Deloof 2003). Extreme working capital increases the cost of liquidity which eventually has a detrimental influence on the firm's profitability; and on the contrary if there is insufficient working capital, it will disrupt the basic operations in the firm (Van-Horne and Wachowicz, 2004). Therefore, efforts should be made to optimise the source of working capital and amount.

Working capital should be managed in such a manner that the firm achieves both the objective of business firm of value generation and liquidity maintenance (Sharma *et al.* 2011;

Wasilewski *et al.* 2009; Wasilewski *et al.* 2006; Shin *et al.* 1998). The association of working capital and firm profitability has been studied a lot in previous literature (Sharma *et al.* 2011; Mohammad *et al.* 2010; Garcia-Teruel *et al.* 2007; Deloof 2003; Jose *et al.* 1996). Generally, CCC evolved by Richards *et al.* (1980) has been applied in the previous researches to measure efficiency in working capital management. It has also been seen in recent research studies that shortening of working capital cycle has a positive impact on the profitability of the firm.

However, there are few research studies in which the relationship between working capital management and financial performance has been assessed in relation to agribusinesses. And the results of the studies that were done were ambiguous.

The study focused on Greek food industry (Lyroudi and Lazaridis, 2000) was one of the rarest studies, their research study revealed that there is a positive relation between cash conversion cycle and profitability. Similar research studies have been conducted on Turkish food industry

(AkdoğanandDinç, 2019) in which it was demonstrated that increase in CCC has a positive impact on the profitability of the firm. It is also suggested that valuation can be improved by increasing the CCC upto optimal level. Similar conclusions have been drawn in the study (Thapa, 2013) which was conducted in USA and Canada.

On the other hand, Ahmadiet al. (2012) conducted research on food industry whose results were conversing. Major findings of his research revealed that if increasing CCC (Cash Conversion Cycle), DSO (Day's sales outstanding) and DPO (Days payable outstanding), urge to decline in profitability. The value of shareholders will be increased by maximized by minimizing the working capital, concluded in their research study. Therefore, the aim of this research study is to assess the association between WCM and the financial performance of Indian food corporations which operates in the processing of milk.

2. Literature Review

Lately, there was unpredictable association between expenditure in working capital and profitability which has been discussed in few numbers of papers (Baños-Caballero *et al.* 2014; Mun and Jang 2015; Aktaset *al.*, 2015; Anton, 2017; Tsuruta, 2018; Botet *al.* 2019). A nonlinear correlation assumes the expenditure in working capital is having an appreciative impact on profitability in corporate up to inadequately, called the most advantageous amount of working capital. Working capital might have become a pessimistic crucial of firm performance, above the optimum level. The acceptance and rejection correlation with a breakeven level is yelled an "inverted U-shaped relationship" (Mahmoodet *al.* 2019). Considering this "entrepreneurial success can refer to the mere fact of continuing to run the business" (Awruk and Staniewski, 2019), in factors of entrepreneurial achievement can be concede as momentous.

To comprehend the association between the working capital and the company performance, different opposing opinions are given in the academic literature. On the one hand, most previous research based on the firms that are from developed economies in

the world—Finland (Enqvist *et al.* 2014), The United Kingdom (Goncalves *et al.* 2018), or developing economies—Egypt (Moussa, 2018), Ghana (Kabuyeet *al.* 2018), Vietnam (Nguyen and Nguyen, 2018), Uganda (Kabuyeet *al.* 2019), Ghana (2020), and United States (Lyngstadaas, 2020). In Uganda, Kabuye *et al.* (2019) explored the effect of two variables namely working capital and internal control system on 110 supermarkets on financial performance. He come across that WCM is a remarkable component of financial performance.

Moussa (2018) studied the effect of performance of 68 'industrial enterprises' in Egypt during the years 2000-2010 of working capital management and finds favourable links between the profitability and the working capital management (determined by the CCC). The researcher highlights the best efficiency of its WCM is not grasped in the stock markets in less developed countries. Analysing the relationships between managing working capital and financial performance, Nguyen and Nguyen (2018) established the positive link between managing working capital and the performance of the Vietnamese listed companies from 2008–2014. Amponsah-Kwatiah and Asiamah (2020) stated that 'listed manufacturing firms in Ghana' show a favourable connection between the profitability and the various working capital constituents.

Goncalves *et al.* (2018) further confirmed that, on the example of United Kingdom unlisted enterprises, the efficiency of WCM would enhance profitability from 2006-2014. In the USA, the increased financial success of listed manufacturing companies is connected with efficient working capital management, as described in Lyngstadaas (2020). Enqvist *et al.* (2014) analysed the effects of managing the working capital on corporate performance in several business cycles on the Finland from 1990 to 2008, points out, by increasing working capital efficiency, that companies may improve their profitability. The fact where working capital allows firms to develop by growing sales and revenues is the first reason for this. Companies are at high risk associated with small inventory levels

(Michalski, 2016). Thus, having a low inventory level leads to adversely affected sales and lower profits for those companies (Michalski, 2016).

From the other country, a competing study sequence claims that the use of the samples in developed economies in the world (Fernandez-Lopez *et al.* 2020; Renet *al.* 2019), the EU (Karatas and Akgun, 2020) and the emerging countries is adversely influencing profitability (Wangetal, 2020; Phametal, 2020; Yusoffetal, 2018; Le, 2019; Ukaegbu, 2014; Habib and Huang, 2016). From the sample of the 'Spanish manufacturing enterprises', from 2010–2016, Fernandez-Lopez *et al.* (2020) indicated the negative correlation has been established between the several working capital components and the business performance. Dalciet *al.* (2019) examined the link between profitability of 285 German non-financial companies and CCC during 2006-2013 and discovered that reducing cash conversion cycles had a significant impact on profitability of small and medium enterprises on the basis of various research methods: like (OLS) Ordinary least squares, fixed effect model and GMM. From the sample of the European Union-28 companies listed in the huge financial crisis held in 2008, Akgun and Karatas (2020) have identified a negative association between working capital and company's performance. In addition, Renet *al.* (2019) identified an adverse connection between Chinese non-state-owned companies' cash conversion cycle and profitability. In a sampling of 497 Vietnamese firms during the period 2007-2016, Le (2019) reveals unfavourable consequences of management of working capital on company value, profitability and risk. Pham *et al.* (2020) similarly observed the same unfavourable association with Vietnamese steel firms. For the 100 selected manufacturing enterprises in Malaysia, the authors demonstrate the significant negative relation with profits between inventory converting duration, average collecting length and the cash conversion cycle. Chang (2018) considered the sample of 31,612 enterprises in 46 countries from 1994-2011, also confirms improving the company's

performance with a conservative working capital management approach. In India too, Shrivastava *et al.* (2017) analysed both traditional panel analyses and the Bayesian approaches, revealed a harmful effect from prolonged cash conversion duration on profitability. Wangetal (2020) also identified the negative relation between working capital management and the success of nonfinancial companies from Pakistan. De-Almeida and Eid (2014) concluded the increase in the amount of working capital in the initial fiscal year decreases the firm's worth, using the data of Brazilian public companies throughout 1995–2009 timeframe. In addition, Ukaegbu (2014) is documented by a panel of 'manufacturing firms in Egypt, Kenya, Nigeria and South Africa' from 2005-2009 on detrimental influence of CCC on the profitability of enterprise as the net operating profit. Secondly, more investments in working capital may lead to greater funding and therefore to an increase in the interest expenditure of companies, and may be at higher risk for bankruptcy. The growth in the level of working capital creates increased holding and management expenses, as a negative effect on value of the firm (Michalski, 2014). A link between the components of working capital and the value depends nonetheless on extent of risk sensitiveness in companies (Michalski, 2014). Michalski (2016) showed that before, during, and after a financial crisis the amount of work capital is greater as a tool to hide the cost in disruptive output.

Another point of view has evolved recently and centred in functional structure in the working capital connection with the profitability of the firm. A number of researches have reported the concave connection between two metrics, and almost all are based on the example of companies in the developed economies in the world (Mahmood *et al.* 2019; Tsuruta, 2018; Aktaset *al.* 2015; Baños Caballero *et al.* 2014; Munand Jang, 2015). Mahmood *et al.* (2019) conducted a sample of Chinese enterprises during the years 2000-2017 reported 'a reversed U-shaped working capital-profit link' using GMM as a technique. Laghari and Chengang (2019), also conducted verifiable

research for inverted U connections between the profitability of Chinese listed businesses and the working capital. Tsuruta (2018) showed that the working capital in Japan has a negative short-term impact on the profitability of the company but a good influence on a longer period using data from over 100,000 small enterprises. From the sample in 437 nonfinancial firms in India, using the GMM methodologies, Altafand Shah (2018) presented facts in the link inverted in the 'U-shape' between WCMand Company profitability. In addition, Afrifa and Padachi (2016), applied the panel data regression method on the sample of 160 listed corporations, reports also on concave connection between the working capital levels (made by the CCC). Aktaset *al.* (2015) reported an association between the company's success and working capital management, using fixed-effect regressions, on the sample of companies in the USA from 1982 to 2011. The researchers emphasise the ideal level of investment in WC, where companies might concentrate to increase overall performance.

Gabriel *et al.* (2020) included empirical data for the sample in 719 listed firms based in Poland from 2007-2016 on the working capital profitability relationship. The link has proven to be U-shaped based on the numerous panel data methodologies. The empirical data show that increasing discounts and sales on the initial payments at the low working capital, significantly affect company profitability. However, subsequent increases in WC over the optimal level generate the negative trend of WC, indicating the drawbacks of working capital financing, opportunities and the high interest rates correspondingly.

The literature acknowledges some key pathways which modulate the link between working capital and corporate performance. Corporate governance is a key conduit. The evidence supporting WCM's empirical collective influence the corporate governance and the financial performance in the US

companies is provided by Kayaniet *al.* (2019). In addition, CEO qualities might cause the endogeneityproblem.

The empirical findings are mainly presented from the methodological perspective on the static panel data technique (regression analyses) and correlation analysis. Researchers have recently been using strategies such as GMM to manage endogeneity issues (Oc and Anton, 2017, Dalciet *al.* 2019; Altaf and Shah, 2018; Bot, Laghari and Chengang, 2019; Mahmoodet *al.* 2019).

3. Methodology

3.1 Data set

The study considers all the listed firms of dairy sector in Bombay stock exchange(BSE) of India aspopulation of the study.The sample has been taken of 10 listed firms of dairy sector in BSE for the period 31st march 2010 to 31st march 2020. Data ofone extra year is used for calculation of ratios variables like: Debt turnover, change in sales and change in profits etc. to make balanced 10-years for analysis. The data has been obtained from ProwessIQ.

3.2 Variables and measurement

In this study, the variable has been selected based on the literature. Dependent variables of the study are identified Net profit margin(NPM), and Gross operating profit ratio(GOPR) represents the firm's profitability. while the Cash conversion cycle(CCC), Receivable collection period(RCP), Accounts payable period(APP), Inventory conversion period(ICP), are independent variablestaken as the proxies for working capital management. In addition,Debtors' turnover ratio(DTR) and current assets to total assets(CATA) also taken as independent variables. The controlled variablesare also very important in the multiple regression analysis. Therefore,firm size(SIZE), firm age(AGE) and debt equity ratio taken as the control variable in the study.

Table 1. Presents the process of computation of variable used in panel regression.

Table 1. Table of Variables

Dependent Variable	Calculation Process
Gross operating profit(GOPR)	EBIT / Net Sales
Net profit margin(NPR)	Net Income / Net Sales

Independent Variable	
Accounts payable Period(APP)	(Average Creditor / Cost of Goods Sold) * 365
Capital assets to total asset(CATA)	Current Assets / Total Assets
Cash conversion cycle(CCC)	Receivable Collection period + Inventory Conversion period - Accounts payable Period
Debtor turnover ratio(DTR)	Sales / Sundry Debtor
Inventory Conversion period(ICP)	(Inventory / Cost of Goods Sold) * 365
Receivable Collection period(RCP)	(Average Debtors / Sales)* 365
Control Variable	
Age of Firm(AGE)	number of years from the date of incorporation of company
Current Ratio(CR)	Current Assets / Current Liabilities
Debt equity Ratio(DER)	External Equities or Debt / Equity Capital
Size of firm(SIZE)	The natural logarithm of total assets

Notes: Abbreviations written in the parenthesis are used in the whole paper.

3.3 Model specification

The Hausman test is used to decide Consistent model between the random or fixed effect model. The p-value of Hausman test less than 0.05 suggests that the null hypothesis is rejected and Fixed

effect model is consistent and vice-versa. Based on Hausman test results following static panel models are used in study to examine the significance of the difference among the firms and within the years.

3.3.1 Fixed effects models

$$NPM_{it} = \alpha_i + \beta_0 + \beta_1 APP_{it} + \beta_2 CATA_{it} + \beta_3 CCC_{it} + \beta_4 DTR_{it} + \beta_5 ICP_{it} + \beta_6 RCP_{it} + \beta_7 AGE_{it} + \beta_8 CR_{it} + \beta_9 DER_{it} + \beta_{10} SIZE_{it} + \epsilon_{it}$$

$$GOPR_{it} = \alpha_i + \beta_0 + \beta_1 APP_{it} + \beta_2 CATA_{it} + \beta_3 CCC_{it} + \beta_4 DTR_{it} + \beta_5 ICP_{it} + \beta_6 RCP_{it} + \beta_7 AGE_{it} + \beta_8 CR_{it} + \beta_9 DER_{it} + \beta_{10} SIZE_{it} + \epsilon_{it}$$

3.3.2 Random effects model

$$NPM_{it} = \beta_0 + \beta_1 APP_{it} + \beta_2 CATA_{it} + \beta_3 CCC_{it} + \beta_4 DTR_{it} + \beta_5 ICP_{it} + \beta_6 RCP_{it} + \beta_7 AGE_{it} + \beta_8 CR_{it} + \beta_9 DER_{it} + \beta_{10} SIZE_{it} + \mu_{it} + \epsilon_{it}$$

$$GOPR_{it} = \beta_0 + \beta_1 APP_{it} + \beta_2 CATA_{it} + \beta_3 CCC_{it} + \beta_4 DTR_{it} + \beta_5 ICP_{it} + \beta_6 RCP_{it} + \beta_7 AGE_{it} + \beta_8 CR_{it} + \beta_9 DER_{it} + \beta_{10} SIZE_{it} + \mu_{it} + \epsilon_{it}$$

Where $\epsilon_{it} \sim iid(0, \sigma_\epsilon^2)$ and $\mu_{it} \sim iid(0, \sigma_\mu^2)$

α_i = Firm-specific effect variable

β_0 = Constant

ϵ_{it} = Within-firm error

μ = unobserved Random heterogeneity between firms

i = subscript for firm

t = time

4. Results and discussion

4.1 Descriptive statistics

Descriptive statistics of the variables is presented in table 2. The mean measured the average value of the variables under the study. The average CCC is 94.53 followed by RCP 62.84, DTR 56.82, ICP 55.37 while the average value of GPR is 0.081. The maximum value of RCP IS 4001.15 followed by CCC (3869.08), DTR (626.55), APP (142.77), ICP (50.20). The minimum value of NPM is -136.71 while the minimum value of APP and

DER is 0. Highest skewness is observed in RCP (9.71) and CCC (9.66); followed by CR (5.005) and DTR (4.39) while negative skewness is found for NPM (-6.215). The variables are having high Kurtosis values ranging from 96.233 to 3.324 implying the variables are having fat tails. standard deviation with respect to their mean is observed in RCP (399.63), followed by CCC (383.614) while the GPR (0.288), CATA (0.090) implying that the values in series are comparatively less consistent. All the series

except SIZE, are not normally distributed, rejected. since p-value of Jarque-Bera statistics is

Table 2.Descriptive statistics

Variables	Mean	Median	Max.	Mini.	SD	Skewness	Kurtosis	Jarque-Bera	Prob*	Obs.
GPOR	0.08	0.05	2.235	-1.320	0.28	2.800	38.786	5466.59	0.000	100
NPM	1.29	2.33	28.250	-136.710	17.35	-6.215	46.844	8653.47	0.000	100
APP	23.68	15.24	142.778	0.000	23.09	2.003	8.940	213.83	0.000	100
CATA	0.39	0.35	0.875	0.059	0.20	0.611	2.814	6.36	0.041	100
CCC	94.53	52.28	3869.087	-4.336	383.61	9.669	95.635	37313.43	0.000	100
DTR	56.82	31.43	626.550	0.090	85.21	4.395	26.463	2615.68	0.000	100
ICP	55.37	50.20	130.993	2.224	32.63	0.624	2.512	7.48	0.024	100
RCP	62.84	11.61	4001.158	0.583	399.63	9.716	96.233	37791.49	0.000	100
AGE	32.70	27	80	19	15.77	1.950	5.807	96.21	0.000	100
CR	1.33	1.05	9.06	0.36	1.18	5.005	31.568	3818.03	0.000	100
DER	1.33	0.85	5.58	0	1.22	0.937	3.324	15.08	0.001	100
SIZE	5.34	5.36	8.072	2.663	1.41	0.083	2.117	0	0.186	100

4.2 Correlation analysis of variables

Table 3.Present the Pair-wise correlation among the variables under study. The main purpose of the correlation analysis is to check for the important assumption of no multicollinearity among the variable for the panel regression, generally high correlation($1 > .80$) considered as the multicollinearity. In our study CCC and RCP are found highly correlated therefore the impact CCC and RCP is studied separately by two regression equations in analysis.The correlation between GPR and CCC (-0.345), APP (-0.220) and

RCP (-0.365) are negative and significant that these variables are although correlated but are moving in opposite directions, i.e., are negatively related. Significant and positive relationship is also found between CCC and RCP (0.998) implying movement in same direction of both the variables. While The correlation between GPR and AGE is also positive and significant (0.259) this indicates towards positive relations between the two variables.

Table 3.Correlation Analysis

Correlation	GPO R	NPM	APP	CAT A	CCC	DTR	ICP	RCP	AGE	CR	DE R	SIZ E
GPOR	1.000											
NPM	0.571	1.000										
APP	-0.22	-0.27	1.000									

	0	2										
CATA	-0.33 5	-0.32 4	-0.02 4	1.000								
CCC	-0.34 5	-0.54 4	0.515	0.235	1.000							
DTR	0.023	0.066	-0.16 5	-0.33 9	-0.10 9	1.000						
ICP	0.259	0.138	0.442	-0.04 3	-0.10 0	-0.23 0	1.000					
RCP	-0.36 5	-0.55 0	0.516	0.228	0.998	-0.09 5	-0.15 2	1.000				
AGE	0.412	0.177	-0.02 0	-0.53 0	-0.02 9	-0.08 5	0.133	-0.04 0	1.000			
CR	0.228	0.092	-0.12 1	-0.10 7	-0.03 3	-0.22 4	-0.01 0	-0.03 8	0.490	1.000		
DER	-0.07 1	0.052	0.016	0.269	-0.10 6	0.084	0.062	-0.10 6	-0.27 8	-0.32 5	1.00 0	
SIZE	-0.14 0	-0.25 4	-0.00 4	0.007	0.165	0.340	-0.33 4	0.185	0.046	-0.20 2	0.35 5	1.00 0

4.3 Effect of Cash conversion cycle on NPM and GOPR

In This section results of fixed effect and random effect model in relation of effect of Cash conversion cycle on net profit margin(NPM) and Gross operating profit ratio(GOPR)is presented in table III.

Table 4. Impact of CCC on NPM & GPR

DV	NPM	GOPR
	Random Effect model	Fixed effect model
C	18.276(0.032)**	-0.296(0.532)
CCC	-0.019(0.000)***	0.000(0.023)**
DTR	0.009(0.666)	0.000(0.702)
CATA	-16.288(0.115)	0.513(0.139)
AGE	0.139(0.303)	-0.038(0.061)*
CR	0.188(0.901)	0.005(0.855)
DER	2.671(0.059)*	0.025(0.505)
Firm SIZE	-3.290(0.009)***	0.258(0.051)*
No. of Observation	100	100
No. of firm	10	10
R ²	0.398209	0.415799
Adjusted R ²	0.35242	0.303182
Hausman test (Prob>X2)	0.5944	0.0292**

Note: values in the parenthesis are the p-value. Asterisks *, ** & *** present the significant result at 10%, 5% & 1% level of significance

Table 3. Presents the results of panel data regression applied to find the impact of Cash Conversion Cycle(CCC) on NPM and GOPR. Taking the model when NPM is dependent variable, p-value(.5944) of Hausman test suggests the random effect is consistent as the null hypothesis is fail to reject. Therefore,

result of random effect model is taken in the table. While taking the GOPR as dependent variable the significant p-value(.0292) of Hausman test suggest the fixed effect model is consistent therefore result of Fixed effect model is explained. The model has an adjusted R² indicating 35% and 30% of the variations in the NPM and GOPR is explained by CCC

respectively. The coefficients of CCC (-0.019) and SIZE (-3.29) are negative and significant, which indicates that CCC and SIZE are negatively related with the NPM of the firm. Also, one unit increase in CCC leads to .019 unit decrease in NPM of the firm while one unit change in Firm Size leads to 3.29 units inverse change in firm NPM. The DER is also found positive and significant at 10% level.

The results are opposite when GOPR is taken as dependent variable. CCC and Firm size is found positive and significant impact of GPR however firm age has negative (-0.038) and

significant impact in GOPR. The other independent variables i.e., CATA, DTR and CR have found no impact of NPM and GOPR.

4.4 Effect of component of Cash conversion cycle of NPM and GOPR

In this section results of fixed effect and random effect model in relation with components of Cash conversion cycle i.e., accounts payables periods (APP), Receivable collection period (RCP) and Inventory conversion period (ICP) with Net profit margin (NPM) and Gross operating profit Ratio (GOPR) are presented in table 4.

IDV	DV	NPM	GOPR
		Random effect model	Fixed effect model
C		20.880(0.035)**	0.156(0.736)
APP		-0.052(0.602)	-0.002(0.383)
ICP		-0.005(0.933)	0.008(0.000)***
RCP		-0.017(0.003)***	0.000(0.235)
CATA		-19.129(0.086)*	-0.205(0.570)
DTR		0.005(0.813)	0.000(0.708)
AGE		0.120(0.404)	-0.022(0.249)
CR		0.110(0.943)	0.003(0.916)
DER		2.811(0.055)**	0.013(0.722)
Firm SIZE		-3.282(0.018)**	0.059(0.643)
No. of Observation		100	100
No. of firm		10	10
R ²		0.40228	0.531951
Adjusted R ²		0.342508	0.42794
Hausman test (Prob>X2)		0.691	0.0007***
Note: values in the parenthesis are the p-value. *, ** & *** Star marks present the significant result at 10%, 5% & 1% level of significance			

Table 4. presents the results of panel data regression applied to examine the impact of various components of CCC on firm profitability. As shown in the Table 4, the Hausman test suggest the random effect model is consistent in case of NPM as the null hypothesis do not reject (.691) and fixed effect is consistent in case of GOPR as the null hypotheses if reject (.0007) therefore results are presented here are based on Hausman test. The models are having an adjusted R² is 34% for NPR model and 42% for GOPR model indicating the variations in the firm profitability is explained by the various components of CCC taken into consideration in the study, which is a significant portion. The coefficients of RCP (-0.017), CATA (-19.12)

and SIZE (-3.282) are negative and significant, which indicates that RCP, CATA and SIZE are negatively related with the NPM of the firm. Also, one unit increase in RCP leads to 0.017 unit decrease in NPM of the firm while one unit increase in CATA leads to 19.129 units decrease in firm profitability. However, the coefficients of DER (2.81) are positive and indicates that one unit increase in DER make an increment of 2.81 units in the overall profitability of the firm. Considering the GOPR as dependent variable only ICP has found negative and significant impact on GOPR. Other Independent variable in the study have no impact on GOPR.

5. Limitation and future research direction

The study considers the listed firms of dairy sector in India but it is only confined to 10 listed firms of BSE (Bombay Stock Exchange). That is why, future research studies can be conducted considering more firms listed in BSE and as well as NSE (National Stock Exchange). Similar research study can be conducted in cooperative societies operating in milk processing. The data for the period 31st March 2010 to 31st March 2020 has only been considered. Additionally, data from previous time span can also be considered. Similar research studies can also be conducted outside India.

6. Conclusion

Working capital management is a significant component of financial management which facilitates the decision-making concerning current assets and current liabilities. Excessive working capital increases the cost of liquidity which eventually has a detrimental influence on the farm's profitability; and on the contrary if there is insufficient working capital, it will disrupt the basic operations in the enterprise (Van-Horne and Wachowicz, 2004). Therefore, efforts are always made to optimise the source of working capital and amount. Therefore, the present paper examines the impact of cash conversion cycle on firm

performance of Indian dairy firms for the period from 2010-2020. Novel estimation technique of panel fixed effect and random effect regression is used for to serve the purpose of the Study. The results of Hausman test indicate towards the use of Fixed effect model. The findings reveal that working capital and its various components have significant influence over the profitability of dairy firms in India. Further, the impact of Cash conversion cycle and receivables management are significantly negatively impacting the net profit margin of firms implying that firms in dairy sector can increase profit margin by reducing the cash conversion period. The entrepreneurs who are new in the dairy industry set up their enterprises availing the subsidies provided by the government; but are unable to maintain the liquidity in their dairy firm due to less profitability in the later stages. The findings have important policy implications such as, the government should focus on providing sufficient liquidity funds to the dairy firms in India by adopting more financial inclusiveness policies. The dairy sector which is not so developed in a developing economy like India, needs to be developed by adopting development policies.

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LEVERAGING FINTECH INNOVATIONS FOR BOOSTING ECONOMIC GROWTH POST-COVID IN INDIA

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ABSTRACT

COVID-19 has changed the world order in all facets of life including nations, society, politics and economy. There is not a single country in the world which has been untouched by the pandemic. In fact, pre-covid 19 era and post-covid 19 era are now two different eras which can never be compared. The current topic of my study is aimed at finding out and suggesting the enhanced role of fintech in boosting the economy of our country. Financial Technology (FinTech) is a comprehensive term used to describe emerging technological innovations in the financial services sector. Fintech companies are leveraging digital technologies to generate new business ideas and target new segments of the market in an economically viable manner. The main objective of this study is to establish linkages between fintech innovations and economic growth. For this, we have firstly discussed fintech and then highlighted various innovations in the fintech area. Digital Payments have been at the forefront of India's leading FinTech sector. So, we have used Mobile Banking and RTGS transactions as the proxy of fintech innovations. Real Gross Domestic Product (GDP) has been used as the proxy for measuring the economic growth of India. Further, in this study, we discussed the role of fintech as a pillar of resilience amidst COVID-19. This study is deductive in nature. Data have been collected from the website of RBI for the period of 2011-2020. Regression, correlation and trend analysis has been used for the analysis of data. The study results reveal there is a strong linkage between fintech innovations and the growth of the Indian economy. The findings of this paper contribute to the existing literature of the economic growth by empirically analyzing the effects of fintech innovations on the growth of the Indian economy.

Keywords: FinTech, innovations, economic growth, digital payments, COVID

Introduction:

FinTech is emerging as a global phenomenon led by the innovators and followed by academics. The term 'FinTech' can be used to describe any innovation relating to how businesses seek to enhance the quality of process, delivery, and use of financial services. FinTech is considered as a key enabler of financial inclusion and mobile financial services as the type of FinTech having the greatest potential to bring the remaining under-banked into the formal financial system that results to ultimately achieving more equitable growth (Demirgüç-Kunt et al. 2018; GPFI 2016). Previously the fintech has grown on its promise to expand the access to the financial system by providing services to undeserved population. But fintech startups provided faster, better and cheaper products and service models disrupting the traditional banking system. Researchers found that digital payments help

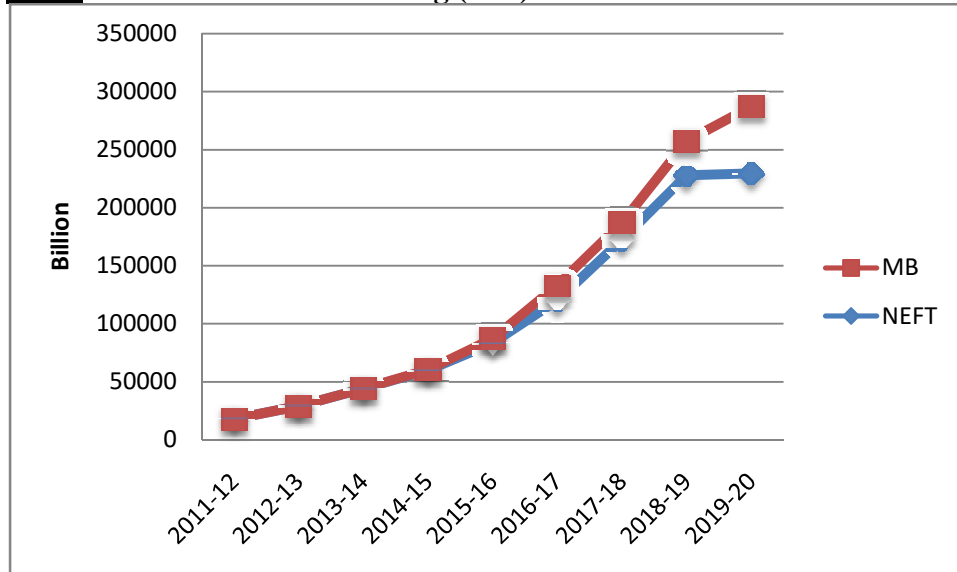
in increasing operational efficiency, generating additional revenue and reduces operating cost to the business people (Alliance, 2003). Thus, this all leads to higher revenue and business growth. Macroeconomic variables show positive effects in the economy having an efficient payment system. Electronic card payments lead to the growth of real global gross domestic product (GDP) on an average of 1.8% (Zandi, 2013). Sahay, Allmen et al. (2020) reveals in their study that digital finance is associated with higher GDP growth and is increasing financial inclusion. The findings of the study suggested that digital financial inclusion could play a crucial role in reducing the economic and social impact of the COVID-19 crisis.

Fig. 1 exhibits the trend of major fintech innovations in terms of value of transactions on yearly basis. The period of observation spans between April 2011 and March 2020.

The casual look at the figure shows upward trend in the value of transactions across the

platform.

Fig. 1: Trend of Mobile Banking (MB) and NEFT transactions in India



Source: RBI website

1. Literature Review:

We review three conceptions of literature that are relevant to this paper and investigate the relationship between: fintech innovations and economic growth.

1.1. Concept of FinTech

Basically, the term 'FinTech' stands for financial technology and describes financial innovations enabled through technology. Like an umbrella, the term fintech includes innovative financial innovation enabled by IT and along with that it is also used for start-up companies who are delivering those solutions. It also includes the providers of financial services like banks (Zavolokina et al. 2016). FinTech includes technology-enabled business model innovations and digital innovations in the financial sector. Some innovations that are central to FinTech today include mobile payment systems, cryptocurrencies and the blockchain, artificial intelligence and machine learning, peer-to-peer lending and equity crowdfunding, new

digital advisory and trading systems (Thomas Philippon, 2016). FinTech comprises of not only the application of new digital technologies to financial services along with that it also includes the development of business models and products which rely on these technologies and specifically on digital platforms and processes (OECD, 2018). Beginning from start-ups to big-techs to well established financial institutions, all the key players are leveraging this technological brim along with the financial services value chain to provide efficient and differentiated experiences to the end-user. This has led to the paradigm shift in the financial-landscape where a larger set of options are available for the consumers at the competitive prices. As a developing country which is determined to achieve financial inclusion universally at affordable costs, this is a turning point for us and we should grab the opportunity (Das Shaktikanta, 2019).

Table 1: Categories of FinTech

Category	Overview
Digital payments	The transactions that take place through the online mode without the involvement of any physical exchange of money.
InvestmentTech	Technology solutions providing greater ease of investing and personal wealth management. It includes robo-advisory solutions that use artificial intelligence technologies for the automation of investment advice.
Alternative lending	Online lending platforms and enablers like P2P lending and crowd funding.
InsurTech	Technology enabled solutions for expanding the distribution of insurance products and rethinks them as per the unique requirements of different types of customers.
RegTech	Technology enabled solution primarily for financial institutions and regulators for efficient implementation and monitoring of regulatory compliance.
BankTech	Any other technology solutions that help banks and financial institutions meet the ever-increasing and changing requirements of the customer but are not included in any of the above categories.

Note: This table presents a brief overview of various categories of FinTech.

Source: Deloitte Analysis (2019)

1.2. FinTech Innovations

In this digital age, financial institutions are undergoing a drastic change with respect to their roles and responsibilities, products, service offerings and many more. Innovations in the fintech industry have shaken the whole world. The two key areas which have driven adoption of fintech in the past few years are – adoption of open banking regulations across the globe and adoption of data at the core of the fintech business models (KPMG, 2018). As digitalization, fintech is increasingly embedded in daily economic transactions (Gobble, 2018). Ernst & Young's (2017) highlighted in his study that approx one-third of the consumers in the survey of 20 markets use at least two fintech services and 84% of those surveyed were aware of fintech services. The potential of financial innovation has already been recognized by the innovation world and there has been rise in the number, variety and reach of fintech startups in the last decade (KPMG, 2018).

Currently, in India fintech is primarily a payment's story. In the fintech space majority of revenues and investment is accounted by mobile wallets and simple digital payment services. Companies like PayTm, MobiKwik are leveraging the rapid increase in the use of smart phones and internet connectivity which is increasing the trends of online shopping. Demonetisation drive was a boon for these companies; it pushed people towards digital payments at an accelerated rate (Nathan Associates India, 2017). For this study, we have used digital payment as a proxy of fintech innovation.

Some major fintech innovations in India that are in the trend now days are discussed below.

1. Quick Response Codes (QR Codes):
The biggest innovation in digital payment's ecosystem is QR codes. It was the first payment mode which brought American Express, MasterCard, Visa and our domestic card RuPay under an

equivalent umbrella. Now QR codes have been made mandatory to be interoperable and accept payments from all UPI apps. This will help to reveal the true potential of these stickers which are pasted nowadays almost at every shop or merchant location.

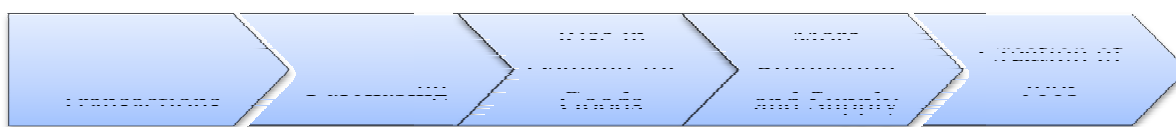
2. **Instant Settlements available 24/7:** In India, instant settlements can be done by retail customers through IMPS (Immediate Payment Service), NEFT (National Electronics Funds Transfer) and UPI (Unified Payments Service). Now it's straightforward for consumers to settle funds instantly with each other and that too directly into their bank accounts. Today, all third party apps like Google Pay, PhonePe share the largest chunk of UPI transactions done across the country.
3. **Mobile Banking:** It is a service provided by banks or other financial institution allowing its customers to transact remotely with the use of mobile devices.
4. **Near Field Communication(NFC) Card:** This innovation has been a boon in the covid times. Transactions through NFC card help go contactless, where the customer gets identified by holding cards close to the terminal for a few seconds.
5. **Video KYC:** It allows the opening of bank accounts and providing many other services remotely. In post COVID era, bank and financial institutions will focus on adopting this innovation.
6. **Aadhaar-enabled Payment System (AePS):** Poor, illiterate or migrant workers who were not using any specific instrument or bank channels to send money to their family members were benefited by this innovation. In this mechanism there is no requirement of smart phones or a card, the authentication mode is the customers biometric.

1.3. FinTech Innovations and Economic Growth

Households are not having that much access to electricity or clean water as much to the mobile phone. In the developing world mobile phones are owned by 8 out of a 10 people (World Bank, 2016). ICT including fintech can play an important role in reduction of income inequality especially in developing countries. Asongu and Le Roux (2017) used a panel of 49 Sub-Saharan countries for the period of 2000-2012 and found that penetration of mobile internet and broadband have a positive impact on inclusive growth.

This is true that economic development is usually a long journey, but fintech innovations can speed up the progress and at a very affordable cost. Imagine if a person in the rural area gets an easy access to credit he will not have to spend his time in travelling many miles to a cash agent. In the same way, it would also be easy for small businesses to expand if they had the access to credit. It will also provide enormous new business opportunities for banks, fintech players, telecom companies or any company that harnesses the low costs of transacting digitally to serve a much broader customer base of individuals and businesses profitably. It requires multiyear efforts for the countries in digitalization of finance but it is better to start sooner for gaining the rewards faster in the form of greater innovation, increase in growth and more inclusion. The best part is there is already the existence of digital infrastructure which is required and is also further improving (Manyika, Lund & et al. 2016).

FinTech innovations facilitate cashless transactions. It is more convenient for people to transact digitally which led to purchasing more in a shorter time. Ultimately, most of the people purchase items impulsively, thus contributing to the economic growth. Fig. (2) & (3) depict the manner in which digital transactions are proving to be a huge game changer for the Indian economy.

Fig. 2: Role of Digital Transactions in Generating Employment

Source: Self designed

Fig. 3: Role of Digital Transactions in Financial Growth

Source: Self designed

Finance Minister Nirmala Sitharaman stated that better assessment of a country's economic growth can be done through an increase in digitization. She also advised tax practitioners to suggest their clients to switch to digital modes of payment. Further, she said that if commercial transactions do not come under the monitorable radar, India's gross domestic product (GDP) cannot be correctly estimated. A study by Deloitte (2013) on the economic impact of online payments in Europe highlights the critical role of online payments in the continued growth and development of the European economy. They harness the potential of the internet as the trade platform stimulating competition and economic growth in the country. Payment of wages, contribution of taxes and generation of returns by online payment industry players, their use of intermediate suppliers and the induced economic impact has direct and indirect effects that flow through the economy. This enables €6.6 billion of economic impact.

In emerging economies, approximately 2 billion individuals and 200 million businesses lack access to savings and credit, and even those with access can hardly pay for a limited range of products. Expansion of digital technology is now offering an opportunity to provide financial services at a lower cost, enhancing financial inclusion and enabling a large rise in productivity across the economy. A field research was conducted in 7 countries that are Brazil, China, Ethiopia, India, Mexico,

Nigeria, and Pakistan. The study reveals that widespread use of digital finance could boost the annual GDP of all emerging economies by \$3.7 trillion by 2025, i.e., a 6% increase versus an average scenario of business. Lower-income countries such as India, Ethiopia, and Nigeria are having the utmost potential, with the opportunity to add 10 to 12% to their GDP. In 2014, approximately 80% of adults in emerging economies had a mobile phone, while only 55% had financial accounts—and mobile phone penetration is growing quickly. The cost of providing financial services can be reduced by 80 to 90% by the usage of mobile payments for transactions (Manyika, Lund & et al. 2016).

1.4. Implications of the Literature

From a review of literature, we have drawn several research implications. First, fintech consists of various financial innovations enabled through technology. FinTech is divided into different categories. Second, presently in India, fintech is basically a payments story. Literature reveals that mobile banking, NEFT are playing a major role in the area of digital payments. Convenient digital transactions can boost the annual GDP of all emerging economies, whether directly or indirectly. So there is a need to establish a relationship between fintech and economic growth in the developing countries like India.

2. Rationale of the Study

Innovations in the FinTech area have the potential to deliver a range of benefits, especially cost reductions and efficiency.

improvements. Technological developments are the reason behind the fundamental change of the way people accesses financial services and increasing the financial inclusion. Manyika, Lund & et al. (2016) highlighted in their study the impact of digital finance on GDP of the emerging economies. They presented a comprehensive approach to quantify the economic, political and social benefits of digital finance. It is beneficial for all including business, individuals, financial service providers and the government. These benefits can collectively boost GDP and creation of jobs. Several studies reveal that the developments in the fintech area ultimately have a major contribution in boosting the economic growth of the developing countries. But there is a limited research focusing on discussing the role of fintech innovations in the growth of India. Thus, it is important to understand the concept of fintech and discuss innovations in this area. And also analyze how these innovations contribute in the economic growth of the country. This study also discusses the role of fintech amidst COVID. This will help the policy-makers to understand the significance of expansion of digital financial services and accordingly formulate the strategies for its effective delivery to various groups of the society.

3. Objectives of the Study

1. To understand the concept of fintech.
2. To discuss major fintech innovations in India.
3. To establish linkages between fintech and economic growth.
4. To study the role of fintech as a pillar of resilience amidst COVID-19.

5. Hypothesis

$H_{0,1}$: There is no linkage between fintech and economic growth.

$H_{1,1}$: There is a linkage between fintech and economic growth.

7. Results and Discussions

Following are the findings of the study:

$H_{0,2}$: There is no role of fintech in resilience amid COVID-19 crisis.

$H_{1,2}$: There is role of fintech in resilience amid COVID-19 crisis.

6. Research Methodology

6.1. Data Collection

This study is primarily based on secondary data. Data are collected from Journals, Govt. Publications, newspapers, magazines, and websites. For our empirical analysis, we have collected data from the website of Reserve Bank of India (RBI).

6.2. Tools & Techniques

- NEFT and mobile banking transactions are used as proxy of fintech innovations.
- For measuring the economic growth real GDP has been used as a proxy (Wang et al. 2016).
- The study examines relationship between fintech innovations and economic growth in India for the period of 2011-12 to 2019-20.
- Correlation, regression analysis has been used as a statistical tool for the empirical analysis.
- The multiple regression models were used to determine the relationship between the variables of the study. For this, below mentioned regression model was used:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \epsilon$$

Where, y = dependent variable (economic growth) i.e. real gross domestic product (GDP); $\beta_0 - \beta_2$ = model parameters or coefficients; x_1 and x_2 = independent variables (fintech innovations) that are NEFT and Mobile Banking transactions and ϵ = error term.

- Trend analysis has been used to depict the usage of fintech innovations during the COVID times.
- MS-Excel software has been used for the empirical analysis of data.

Table 2: Model Summary

<i>Regression Statistics</i>	
Multiple R	0.982817481
R Square	0.965930201
Adjusted R Square	0.954573601
Standard Error	4019.122349
Observations	9

Table (2) presents a model summary and indicates the adjusted R square used as test for model fitness. The regression equation seems to be very useful for making predictions since the value of R^2 is 0.96 which is very close to 1. This indicates that more than 90% of variation is contributed by the independent variables

(fintechinnovations) in the dependent variable(economic growth).The regression analysis clearly signifies that there exists a close relationship amongst the three constructs as the correlation coefficient between them is 0.98.

Table 3: ANOVA table

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	2747830097.823	1373915048.911	85.055	0.000
Residual	6	96920066.756	16153344.459		
Total	8	2844750164.579			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	81037.796	2728.704	29.698	0.000	74360.898	87714.694	74360.898	87714.694
NEFT	0.236	0.037	6.417	0.001	0.146	0.326	0.146	0.326
MB	-0.058	0.157	-0.368	0.726	-0.441	0.325	-0.441	0.325

The ANOVA indicates in table (3), that the null hypothesis ($H_{0.1}$) i.e. there is no linkage between economic growth and fintech innovations is rejected since the F-value is significant as $p < 0.05$. In addition the F-value is high i.e. 85.055, so the probability of accepting alternative hypothesis ($H_{1.1}$) results is quite high.

Table 4: Correlation

	<i>NEFT</i>	<i>MB</i>	<i>Real GDP</i>
NEFT	1		
MB	0.884127	1	
Real GDP	0.982427	0.85564	1

Table (4) depicts there is positive correlation between GDP and NEFT transactions and there also exists the positive correlation between GDP and mobile banking (MB) transactions.

8. Role of FinTech as a Pillar of Resilience amidst Covid-19

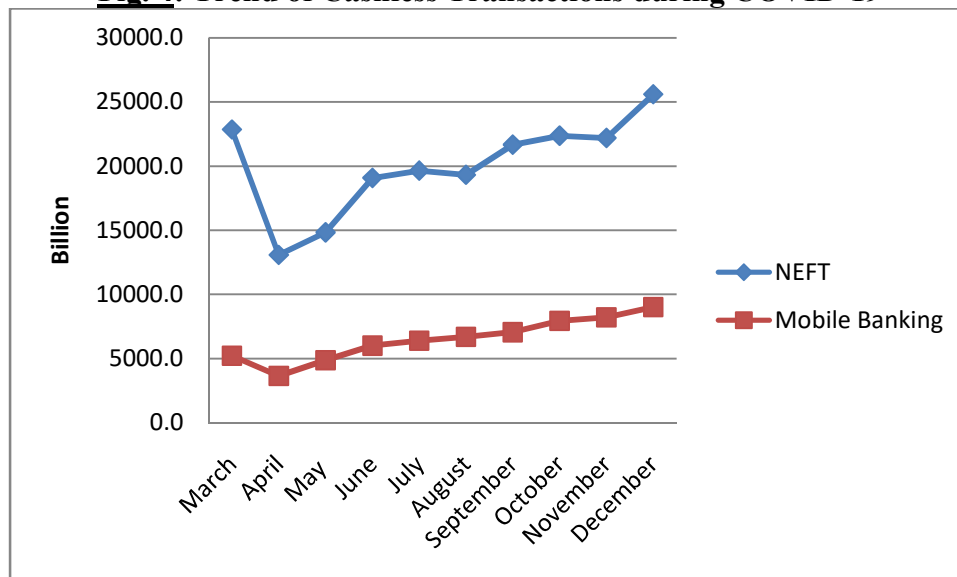
Digital transformation in financial services was the need of the hour amidst COVID-19.

Importance of digital payment services and online banking was highlighted when there were restrictions on the movement and closure of bank branches. During this unprecedented time people realized the importance of varied fintech innovations like digital wallets, mobile money. This was the time when we all were afraid of going anywhere or touching anything and during

this period mobile money and digital wallets proved to be boon for all of us. Mobile money is not only beneficial in sending or receiving the payments but also records of mobile money reveals the financial behavior of the unbanked and provides information that can help to enhance transparency and calculating

credit scores through electronic records. Furthermore, people started reconsidering cash use with the perception of banknotes as a medium for disease transmission amid the spread of COVID-19. Cashless and contactless transactions are considered as safer during these times.

Fig. 4: Trend of Cashless Transactions during COVID-19



Source: RBI website

Literature reveals that mobile banking, NEFT, RTGS, digital wallets are some major innovations in the fintech area. Fig. 4 shows the trend of NEFT and mobile banking transactions during the COVID i.e. March-December, 2020. Based on this data, we can predict the overall trend of cashless transactions during the COVID times. Pattern showing in Fig. 4 explains there was once a fall in digital transactions in April because of lockdown. But as the lockdown was lifted, there was continuous increase in digital transactions. One of the main reasons behind the rise in cashless transactions was afraid of disease transmission among the people. Hence, the trend analysis reveals that the null hypothesis ($H_{0.2}$) i.e. there is no role of fintech in resilience amid COVID-19 crisis is rejected as graph shows an increase in digital transactions after a certain period.

9. Conclusion

FinTech innovations are becoming more pervasive in everyday transactions because of increase in their adoption and more inclusive and open regulatory framework allows them to grow. There is no choice for the incumbent financial institutions, and they can only now

do is that to rethink of their strategic choices and create opportunities in the market for strategic collaborations with fintech start-ups. Discussions among businesses, fintech entrepreneurs and regulators should aim to analyze the changes in supply and value chains created by the evolution of fintech trends and assess the impact of national regulatory processes on cross-border investment and performance of innovations across markets. Policymakers have to take it up as a challenge to ensure that FinTech grows in a way that creates maximum opportunities and reduces the risks for society. Fintech also acts as an engine for the sustainable development of developing economies.

This study adds to the existing literature on emerging fintech innovations and economic growth, which will enable academics and researchers to attend to the role of fintech innovations in economic growth of the country. We have focused on discussing the concept of fintech and different categories in the fintech. As literature reveals that payment and settlement system is an important part of fintech ecosystem and in that NEFT and

Mobile Banking are the major innovations, so we have used these two as the proxy of fintech innovations in India. Further real GDP has been used as indicator for measuring the economic growth of the country. The study reveals there is a linkage between fintech innovations and economic growth of India. We have also discussed how these innovations have act as a supporter for people during the times of COVID crisis. Findings of this study are beneficial for the policy-makers in making various strategies aiming at the use

of fintech innovations to its fullest potential for boosting the economic growth.

Limitation of the study is that it has only focused on two innovations in the fintech area for establishing its relationship with the economic growth and only one aspect of the economic growth i.e. gross domestic product (GDP) has been included. Further researchers may widen the scope by including other important variables and enhance the existing literature.

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FACTORS MOTIVATING FARMERS TOWARDS ORGANIC FARMING ADOPTION**V.Gurumoorthy¹**

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ABSTRACT

The negative aspects emerging from the chemical farming has made the farming community realize the immense benefits organic method of farming offers. The entire world is grappling under the detrimental effects of chemical farming. Chemical farming poses a major threat for all the living beings on the planet. Initially, Chemical farming was touted to be the highest yielding farming method, which made the entire farming community to convert their farming method. However, over the years due to extensive use of harmful chemicals, the soil lost its fertility and the harmful chemicals have entered the food chain of all the living beings. With the true identity of chemical farming revealed, many countries are emphasizing the need for adopting organic farming. Due to the increasing stress laid on the organic farming, many farmers are opting for a complete chemical free farming. Moreover, the ever growing organic market has also set the stage for many opting for cultivating crops organically. Thus, there are several factors which motivate the farmers to adopt organic farming. In order to analyse and study the various factors, the present study has been taken up to analyse the factors motivating the farmers to adopt organic farming.

Keywords: *Organic Farming, Motivating factors, Chemical farming*

INTRODUCTION

The entire world is grappling under the detrimental effects of chemical farming. Chemical farming poses a major threat for all the living beings on the planet. Initially, Chemical farming was touted to be the highest yielding farming method, which made the entire farming community to convert their farming method. However, over the years due to extensive use of harmful chemicals, the soil lost its fertility and the harmful chemicals have entered the food chain of all the living beings. With the true identity of chemical farming revealed, many countries are emphasizing the need for adopting organic farming. Due to the increasing stress laid on the organic farming, many farmers are opting for a complete chemical free farming. Moreover, the ever growing organic market has also set the stage for many opting for cultivating crops organically. Thus, there are several factors which motivate the farmers to adopt organic farming. In order to analyse and study the various factors, the present study has been taken up to analyse the factors motivating the farmers to adopt organic farming.

OBJECTIVES OF THE STUDY

- To study the various factors motivating the farmers to adopt organic farming
- To analyse the factors motivating the farmers by using appropriate statistical tools
- To summarize and present the results

METHODOLOGY

A well structured interview schedule with open ended and close ended questions was designed. A sample of 150 organic farmers were surveyed by adopting snowball sampling and the researcher administered the interview schedule among the farmers. The collected data were classified and analyzed by using relevant statistical tools. ANOVA, t test were used for the purpose of analysis. The socio economic factors like Age, Educational qualification, Community, Annual Income and Area of residence were compared with the list of motivating factors and the results have been presented herewith.

RESULTS AND DISCUSSION

The motivation for adopting organic farming among different demographic profile of organic farmers namely, age group, educational qualification, , community, annual income and area of residence have

been analysed with the help of ANOVA and 't' test and the results are presented.

1. Age Group of organic farmers and Motivation for adopting organic farming

In order to find the significant relationship between the age group of organic farmers and motivation for adopting organic farming, 'ANOVA' test is used. The hypothesis is framed as follows,

The null hypothesis (H_{01}) - "There is no significant difference among the different age group of organic farmers with respect to motivation for adopting organic farming".

The result of the 'ANOVA' test for motivation for adopting organic farming among different age groups of organic farmers is presented in Table 1.

Table 1
Age Group of organic farmers and Motivation for adopting organic farming

Motivation for adopting organic farming	Age Group(Mean Score)					F Statistics
	20 – 30 years	30 – 40 years	40 – 50 years	50-60 years	Above 60 years	
It helps in maintaining environment health by reducing the level of pollution	4.00	3.59	3.39	3.70	3.51	0.548
It improves water holding capacity	4.42	3.77	3.97	3.59	3.74	0.697
It helps in keeping agricultural production at a higher level and makes it sustainable	2.71	3.00	3.02	3.10	3.12	0.182
It reduces the cost of agricultural production and improves the soil health	2.57	2.27	2.67	2.65	2.83	1.386
Sustaining production system dependent largely on on-farm resources	2.71	2.77	2.76	3.25	2.93	1.898

Source: Primary data

*-Significant at five per cent level

From the above table, it is understood that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who are in the age group of 20 to 30 years as their mean scores are 4.42 and 4.00 respectively. It is further understood that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who belong to the age group between 30-40 years as their mean scores are 3.77 and 3.59 respectively. The table further shows that organic farming improves water holding capacity and organic farming helps in

maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who are in the age group between 40-50 years as their mean scores are 3.97 and 3.39 respectively. Further indicates that organic farming helps in maintaining environment health by reducing the level of pollution and organic farming improves water holding capacity are the important motivation for adopting organic farming among the organic farmers who belong to the age group between 50-60 years as their mean scores are 3.70 and 3.59 respectively. Table further indicates that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming

among the organic farmers who are in the age group of above 60 years as their mean scores are 3.74 and 3.51 respectively. Regarding the motivation for adopting organic farming among the different age group of organic farmers, organic farming helps in maintaining environment health by reducing the level of pollution, organic farming improves water holding capacity, organic farming helps in keeping agricultural production at a higher level and makes it sustainable, organic farming reduces the cost of agricultural production and improves the soil health and sustaining production system dependent largely on on-farm resources are statistically not significant at 5 per cent level.

2. Educational Qualifications of organic farmers and Motivation for adopting organic farming

In order to find the significant relationship between the educational qualifications of organic farmers and motivation for adopting organic farming, 'ANOVA' test is used. The hypothesis is framed as follows,

The null hypothesis (H_{01}) - "There is no significant difference among the different educational qualifications of organic farmers with respect to motivation for adopting organic farming".

The result of the 'ANOVA' test for motivation for adopting organic farming among different educational qualifications of organic farmers is presented in Table 2.

Table 2
Educational Qualifications of organic farmers and Motivation for adopting organic farming

Motivation for adopting organic farming	Educational Qualifications (Mean Score)					F Statistics
	Illiterate	Primary	Higher Secondary	Higher Education	Technical	
It helps in maintaining environment health by reducing the level of pollution	3.62	3.54	3.34	3.76	3.75	0.584
It improves water holding capacity	4.27	3.59	3.71	3.65	4.37	3.169*
It helps in keeping agricultural production at a higher level and makes it sustainable	2.79	2.91	3.02	3.44	2.87	2.761*
It reduces the cost of agricultural production and improves the soil health	2.79	2.56	2.60	2.52	3.12	1.054
Sustaining production system dependent largely on on-farm resources	3.00	2.72	3.02	3.02	3.12	0.680

Source: Primary data

*-Significant at five per cent level

From the above table, it is understood that organic farming improves water holding capacity and organic farming helps in

maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming

among the organic farmers who are illiterates as their mean scores are 4.27 and 3.62 respectively. It is further understood that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who are primary education as their mean scores are 3.59 and 3.54 respectively. The table further shows that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who are higher secondary education as their mean scores are 3.74 and 3.31 respectively. Further indicates that organic farming helps in maintaining environment health by reducing the level of pollution and organic farming improves water holding capacity are the important motivation for adopting organic farming among the organic farmers who are higher education as their mean scores are 3.76 and 3.65 respectively. Table further indicates that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing

the level of pollution are the important motivation for adopting organic farming among the organic farmers who are technical education as their mean scores are 4.37 and 3.75 respectively. Regarding the motivation for adopting organic farming among the different educational qualification of organic farmers, organic farming improves water holding capacity and organic farming helps in keeping agricultural production at a higher level and makes it sustainable are statistically significant at 5 per cent level.

3. Community of organic farmers and Motivation for adopting organic farming

In order to find the significant relationship between the community of organic farmers and motivation for adopting organic farming, 'ANOVA' test is used. The hypothesis is framed as follows,

The null hypothesis (H_0) - "There is no significant difference among the different community of organic farmers with respect to motivation for adopting organic farming".

The result of the 'ANOVA' test for motivation for adopting organic farming among different community of organic farmers is presented in Table 3.

Table 3
Community of organic farmers and Motivation for adopting organic farming

Motivation for adopting organic farming	Community (Mean Score)					F Statistics
	OC	BC	MBC	SC	ST	
It helps in maintaining environment health by reducing the level of pollution	3.70	3.83	3.33	3.00	3.58	2.858*
It improves water holding capacity	3.94	3.90	3.74	3.50	2.83	0.822
It helps in keeping agricultural production at a higher level and makes it sustainable	3.00	2.86	3.25	2.05	3.20	1.205
It reduces the cost of agricultural production and improves the soil health	2.70	2.51	2.70	2.00	2.66	0.626
Sustaining production system dependent largely on on-farm resources	3.05	3.13	2.82	2.10	2.95	2.723*

Source: Primary data

*-Significant at five per cent level

From the above table, it is understood that organic farming improves water holding capacity and organic farming helps in

maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming

among the organic farmers who belong to OC as their mean scores are 3.94 and 3.70 respectively. It is further understood that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who belong to BC as their mean scores are 3.90 and 3.83 respectively. The table further shows that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who belong to MBC as their mean scores are 3.74 and 3.33 respectively. The table further indicates that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who belong to SC as their mean scores are 3.50 and 3.00 respectively. The table further describes that organic farming helps in maintaining environment health by reducing the level of pollution and organic farming helps in keeping agricultural production at a higher

level and makes it sustainable are the important motivation for adopting organic farming among the organic farmers who belong to ST as their mean scores are 3.58 and 3.20 respectively. Regarding the motivation for adopting organic farming among the different community of organic farmers, organic farming helps in maintaining environment health by reducing the level of pollution and sustaining production system dependent largely on on-farm resources are statistically significant at 5 per cent level.

4. Annual income of organic farmers and Motivation for adopting organic farming

In order to find the significant relationship between the annual income of organic farmers and motivation for adopting organic farming, 'ANOVA' test is used. The hypothesis is framed as follows,

The null hypothesis (H_0) - "There is no significant difference among the different annual income of organic farmers with respect to motivation for adopting organic farming".

The result of the 'ANOVA' test for motivation for adopting organic farming among different annual income of organic farmers is presented in Table 4.

Table 4
Annual Income of organic farmers and Motivation for adopting organic farming

Motivation for adopting organic farming	Annual Income (Mean Score)					F Statistics
	Upto Rs.100000	Rs.100000-200000	Rs.200000-300000	Rs.300000-400000	Above Rs.400000	
It helps in maintaining environment health by reducing the level of pollution	3.46	3.63	3.66	3.16	4.33	2.879*
It improves water holding capacity	3.90	3.71	3.75	3.83	3.66	0.144
It helps in keeping	2.93	3.04	3.50	3.00	3.50	2.678*

agricultural production at a higher level and makes it sustainable						
It reduces the cost of agricultural production and improves the soil health	2.65	2.60	2.91	2.66	2.33	0.498
Sustaining production system dependent largely on on-farm resources	2.96	2.93	3.00	3.36	2.66	0.217

Source: Primary data

*-Significant at five per cent level

From the above table, it is understood that organic farming improves water holding capacity and helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who belong to the annual income of upto Rs.1,00,000 as their mean scores are 3.90 and 3.46 respectively. It is further understood that organic farming improves water holding capacity and helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who belong to the annual income between Rs.1,00,000-2,00,000 as their mean scores are 3.71 and 3.63 respectively. The table further shows that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who belong to the annual income between Rs.2,00,000-3,00,000 as their mean scores are 3.75 and 3.66 respectively. The table further indicates that organic farming improves water holding capacity and sustaining production system dependent largely on on-farm resources are

the important motivation for adopting organic farming among the organic farmers who belong to the annual income between Rs.3,00,000-4,00,000 as their mean scores are 3.83 and 3.36 respectively. The table further describes that organic farming helps in maintaining environment health by reducing the level of pollution and organic farming improves water holding capacity are the important motivation for adopting organic farming among the organic farmers who belong to the annual income of Rs.4,00,000 as their mean scores are 4.33 and 3.66 respectively. Regarding the motivation for adopting organic farming among the different annual income of organic farmers, organic farming helps in maintaining environment health by reducing the level of pollution and organic farming helps in keeping agricultural production at a higher level and makes it sustainable are statistically significant at 5 per cent level.

5. Area of residence of organic farmers and Motivation for adopting organic farming

In order to find the significant relationship between the area of residence of organic farmers and motivation for adopting organic farming, 'ANOVA' test is used. The hypothesis is framed as follows,

The null hypothesis (H_0) - “There is no significant difference among the different area of residence of organic farmers with respect to motivation for adopting organic farming”.

The result of the ‘ANOVA’ test for motivation for adopting organic farming among different area of residence of organic farmers is presented in Table 5.

Table 5
Area of residence of organic farmers and Motivation for adopting organic farming

Motivation for adopting organic farming	Area of residence (Mean Score)					F Statistics
	Hamlet	Village	Town Panchayat	Town	City	
It helps in maintaining environment health by reducing the level of pollution	3.91	3.44	3.55	3.81	3.00	3.247*
It improves water holding capacity	4.02	3.67	3.88	4.18	3.40	0.635
It helps in keeping agricultural production at a higher level and makes it sustainable	2.94	3.14	3.33	2.81	2.20	0.936
It reduces the cost of agricultural production and improves the soil health	2.48	2.62	3.22	3.00	2.20	2.973*
Sustaining production system dependent largely on on-farm resources	3.05	2.91	2.77	3.00	3.20	0.301

Source: Primary data

*-Significant at five per cent level

From the above table, it is understood that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who are residing in hamlet area as their mean scores are 4.02 and 3.91 respectively. It is further understood that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who are residing in village area as their mean scores are 3.67 and 3.44 respectively. The table further shows that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who are residing in town panchayat as their mean scores are

3.88 and 3.55 respectively. The table further indicates that organic farming improves water holding capacity and organic farming helps in maintaining environment health by reducing the level of pollution are the important motivation for adopting organic farming among the organic farmers who are residing in town as their mean scores are 4.18 and 3.81 respectively. The table further describes that organic farming improves water holding capacity and sustaining production system dependent largely on on-farm resources are the important motivation for adopting organic farming among the organic farmers who are residing in city as their mean scores are 3.40 and 3.20 respectively. Regarding the motivation for adopting organic farming among the different area of residence of organic farmers, organic farming helps in maintaining environment health by reducing the level of pollution and organic farming reduces the cost of agricultural production and improves the soil health are statistically significant at 5 per cent level.

CONCLUSION

The present study has analysed the motivating factors with appropriate tools. It can be seen that the farmers are highly motivated to pursue organic farming methods in their respective lands. This motivation stems from the untapped opportunities offered by the organic

farming sector. Given the immense potential and possibilities available through organic farming, it would be best if the Government organizes sufficient awareness camps and takes necessary efforts to boost the conversion to organic farming.

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DIGITAL FORENSIC STRATEGIC METHODOLOGIES FOR ESTABLISHING A FRAMEWORK DESIGN

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ABSTRACT

Presently Cyber Security issues are increasing globally, for this reason it is essential to have digital forensic experts in the organizations to handle the digital forensic investigations and analysis. Need of the digital forensics experts are to identify, acquire, preserve, validate, analyse, interpret, and reporting. Digital Forensics are essential now a days to find source of cyber-attacks, type of damage occurred in the IT system, attacker related information, period of the cyber-attack taken place, type of attack and their consequent roles, etc., Wellknown expertise is essential to extract the required information from various log files from different digital devices, which are needed for digital forensic analyses. Digital Forensic experts follow number of methodologies, policies, and procedures based on the case or type of cyber-attack. The present paper discusses the digital forensics and responsibilities of an investigator, strategic methodologies for establishing the framework, which helps the organization for easy investigation, analysis and documentation.

Keywords: Digital Forensics, Network Forensics, Traffic Communication, Investigation, Slack Space, Artifacts, File Carving.

INTRODUCTION

Digital Forensics is a branch of forensic science which uses scientific knowledge for collecting, analysing, documenting, and presenting digital evidence related to cybercrimes and is useful for IT Act protection. [1] Digital evidences are acquired from different types of digital sources and they are analysed for identification of cyber security threats internal, incidents and attacks.

Cyber security incidents and attacks are affecting many organizations with the increase of network usage. Network Security plays a major role in many organizations. As an investigator, it is essential to utilize the information stored in these network security devices to various types of forensic analysis to detect and prevent the cyber-attacks. [2]

This type of forensic evidence data can be gathered from various sources like user-created, digital device, text files stored, audio files, video files, digital images, camera data, encrypted and hidden information, back-up files, e-mails, browsing history, registry, Operating System, social media, etc. Similarly, it may be from network communication systems or from other system generated information including log data from various sources like computer systems, applications, security devices, setup data, entry level devices like routers, config files, printer,

fax, volatile and non-volatile memory, virtual machines, clusters, slack space details. In case of network forensics, evidences are found in network communications systems and traffic flow from one node to another including security devices like firewalls. [3]

Digital forensic investigators use different forensic tools to collect, preserve, and interpret digital evidences. [1] Based on the artifacts systems found in computer investigator acquire the evidences. Based on the findings, suitable inferences are drawn and present these inferences to law Enforcement Team. To do all these, Digital Forensics experts prefer a strategic planning and a systematic approach for better investigations. These strategic and methodology based on type of organization setup, data capture, data structure and required investigations. This approach, is suitable for investigating the digital devices for easily and systematically. [4]

Digital Forensics Investigation considerations

For the doing any digital forensics investigation, the following points need to be considered for acquiring [5] and analyzing the information from various sources:

- Understanding computer environment.

- Data representation methods, file structure and its different types of memory organizations, primary and secondary data storage technology including SSD.
 - Understanding the digital media, Windows Operating System, Registry Management, file system, tools used to carry out data capture, Networking and its role in the type of Cyber-incident.
 - Log handling and its management techniques.
 - Required software tools and its handling procedures.
 - During the evidence collection in LAN, WAN, VPN examine network routers, Host name, Host IP, user nodes, network switches, Ethernet cards, Network Interface cards, Wi-Fi, Voice-over IP (VoIP). Wireless access point, client and web traffic etc.
 - Hashing Techniques need be followed.
 - Study the Slack Space—which is a space generated between the end of the file stored and end of the disk cluster which plays important role in digital forensics specifically retrieving the deleted data.
 - Understand the File Carving- which is a process of searching for known file headers within the disk image used for reconstructing deleted files. It is essential for the investigator to identify the digital forensic controls in the environment. It is also necessary to have a suitable and systematic procedures to be followed for better investigation and to present before the Law Enforcement.[1][24]
 - During ANALYSIS, the contents of the acquired forensic image file are investigated using a set of tools to search for interesting leads within the acquired image.[1] Hidden, deleted, and encrypted files in addition to IM chat logs, Internet browsing history, and deleted e-mails can all be recovered using specialized tools like EnCase, FTK.[1] [4]
 - In REPORT phase, the examiner produces a structured report about his/her findings. Such a report is usually prepared for non-technical people.[1] The general content of Forensic Report should contain details of the findings in brief, acquiring methodology from the digital sources, Artifacts information and technical explanation in details in simple language for understanding without any efforts which includes the investigation conclusion in detail. [2] [5]
- ### Responsibilities of the Investigator
- It is essential to follow official protocol to obtain necessary permission as per the organization or location specific rules. Prior permission needs to be obtained from the concerned team for any type of investigation.[4]
 - All back up media need to be wiped and properly and should be thoroughly verified prior to investigations. Proper Backups need to be taken before starting the investigation process. All these backup media need to be stored in a secured and fireproof environment.
 - Identify digital sources and different types of evidences available.
 - Understand the purpose of evidence gathering. Acquire proper hardware and software for digital forensic investigations. Usage suitable tools need to be selected for better results.
 - Investigator need to understand the organizational evidence acquiring policies and documentation procedures. Suitable policies need to be adopted for collection, preservation, and analysis of digital evidence by adopting required operating procedures.[3]
 - Investigator should know the technology limitations, if any.
 - Ensure the integrity of the data. Proper professional document of the crime scene helps in preparing final report in detail like detailed noting, photographs with suitable comments

of the investigator which would help in preparation of documentation and reports. [6]

- It is necessary to take suitable steps for data integrity of the evidences presented by using write-blockers.

Digital Forensics Framework and Forensic Controls

Investigating areas and digital sources in a typical organizational Virtual Private Network (VPN) Environment are mentioned here as framework. This framework contains different Forensic controls of VPN shown in the figure-1. which are self-explanatory. [7]

Security controls of Virtual Private Network environment are at various places. These locations are like Router, Core switch, Access Switches, VPN connectivity, LAN connection parameters, Internet connectivity, multiple LAN connections in VPN, cyber activities of a LAN, VLAN connectivity procedures and activities held therein, Active Directory management of users, computers and other objects within a network. Proxy server and services, Administrative security Parameters, Servers set-up, utilization, security details, Network Management System operational activities, Applications running on the VPN/ LAN/ Systems,

Software installed and running process details, Operating system set-up and utilities, PC, User, end user details, Virtual Memory, USB and Wi-Fi usage, Antivirus activity, Virtual Machines, Hardware devices utilization logs, Security devices like Firewalls, Security device managers, Security log analyzers and sandbox in Network, Email, Bluetooth, VoIP and video conference systems activities with their log storages, Data Center set-up including both physical and active devices observations, Database, Web Servers, specific purpose firewall for Database, web server protective devices activities and their logs etc. These are few forensic controls in a typical VPN environment.[8] These controls changes based on the set-up and type of environment. It is equally necessary to capture the non-digital source information which may also give some Evidences of the cyber-attacks essentially specifically internal attacks.

Investigating areas and digital sources in a typical organizational Virtual Private Network (VPN) Environment are mentioned here as framework. [9] This framework contains different Forensic controls of VPN shown in the figure-1. which are brief described.

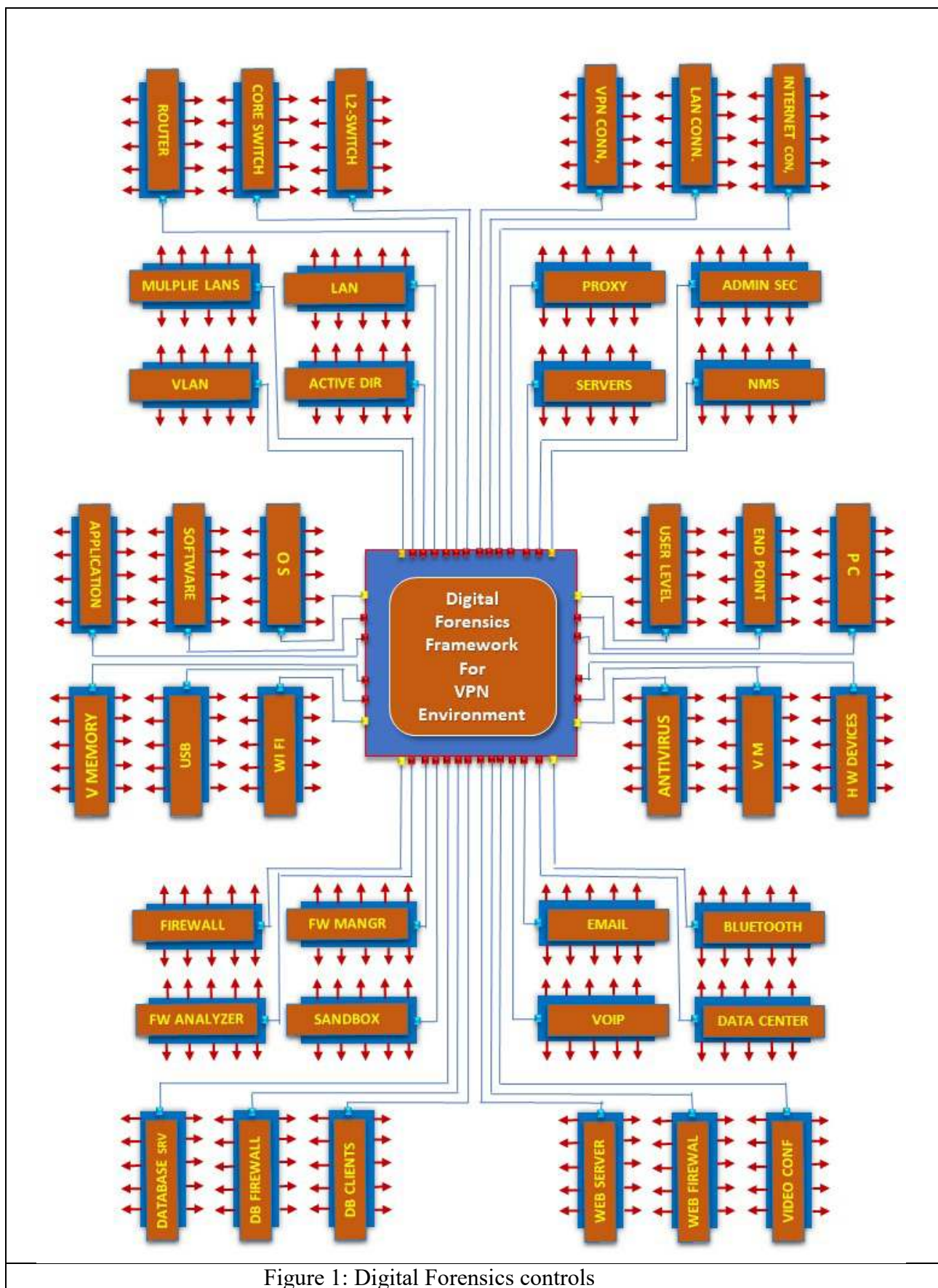


Figure 1: Digital Forensics controls

Digital Forensic Strategic Methodologies

Generally, organizations need to have a strategy, a methodology with a suitable

Security Policy and adopting procedures for establishing a framework as a management

plan for digital investigations. These strategies should meet individual organization requirements by following standard procedures in the IT security Act and Forensics Rules. [10]

Once strategic forensics methodologies are planned, required procedures are derived from them. With well-defined evidence handling policy, procedures and methodologies simplify the investigation process and analysis including acquisition plans from different modes of digital sources. [11]

There may be many approaches for investigations but the present discussion is a generalized strategic methodology for digital investigation procedures. [12] This approach comprises of few of the methodologies of a typical environment. This methodology may be adopted based on type cases or incidents, with a systematic approach for easy handling of investigations. This methodology can also be utilized for managing information systems and documentation. [13] This generalized digital forensic strategic methodology can also be used establishing a framework design for investigations. [16]

Designing aspect of the digital forensic methodologies were discussed for the following:

1. Router Forensics
2. Administrator activity Forensics
3. System Event Forensics Application Visibility and control level Forensics

4. Threat detection Forensics Process
5. Application categories on network forensics
6. Web categories on Network Forensics
7. Application Traffic by bandwidth, sessions, categories on Network Forensics Analysis
8. File usage and Activity Forensics
9. Data violation and Leak Forensics
10. Application Usage Forensics
11. General items forensics
12. Resource usage, IPS, IDS and its Forensics
13. Network activity and its Security Information Forensics
14. Wi-Fi Network activity and its Forensics

1. Router Forensics:

During router investigations, the system needs to be online, whereas in traditional forensic investigations, the system needs to be powered off. [28] The system must be online hence the forensic investigator can have exact knowledge of what type of traffic flows through the router. [14][15] Before starting the job it is essential to obtain suitable permissions and equipment need to be labelled properly. In this process study the security policy, develop an investigation plan, implement the plan and follow the procedure shown in figure-2, and finally generate the router forensic report.

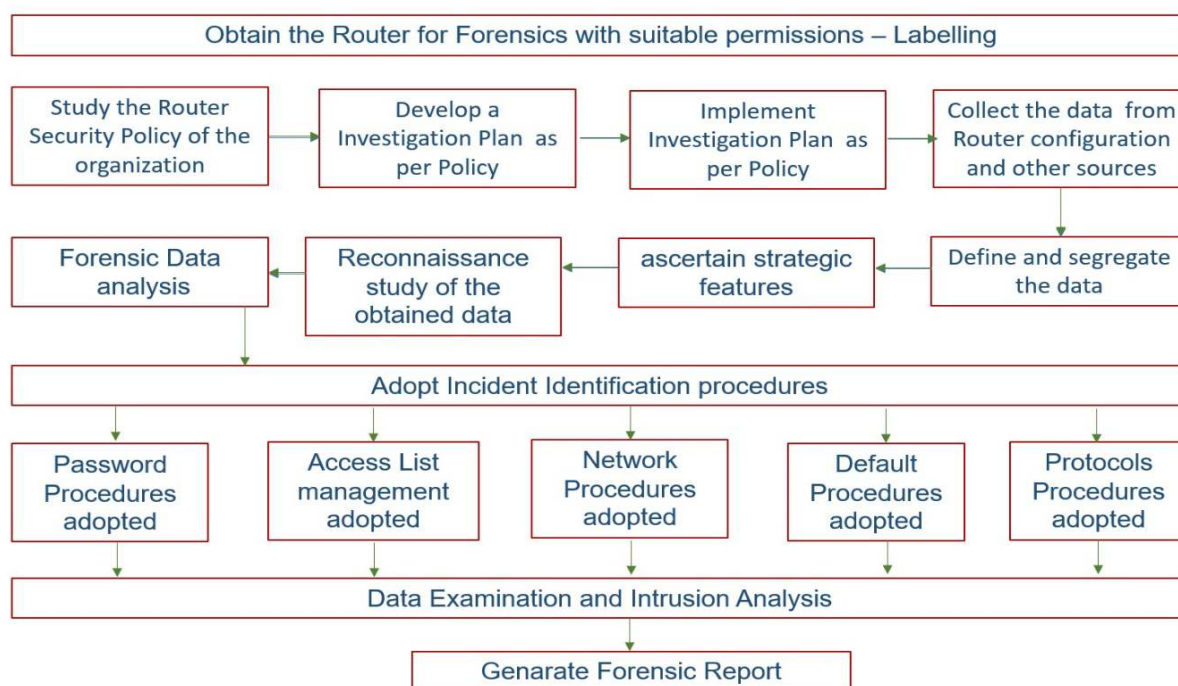


Figure-2: Router Forensics Methodology

2. Administrator activity forensics

Administrator activities provides good information for a forensic investigator which includes User names, login interface details, total number of logins, configuration along with its changes, date wise login details,

duration of the login users, failed logins including the attempts for log-in etc. [14] This information of various devices in the network are useful for investigators (as shown in the Figure-3).

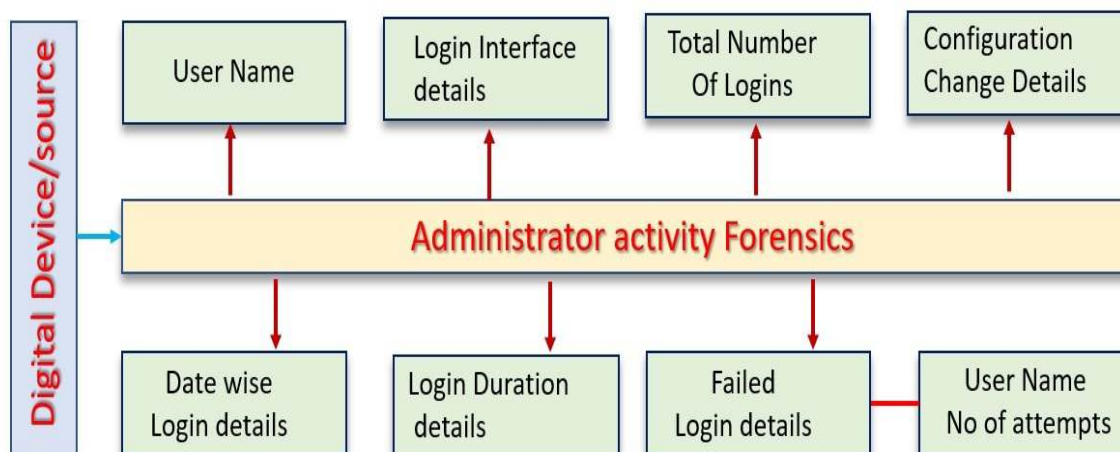


Figure-3: Administrator activity Forensics

3. System Event Forensics

As shown in the Figure-4, Investigators can obtain data like events name, its details, disk log files, deleted files, interface particulars,

system alerts, configuration along with its modification details from system events forensics methodology.[16]

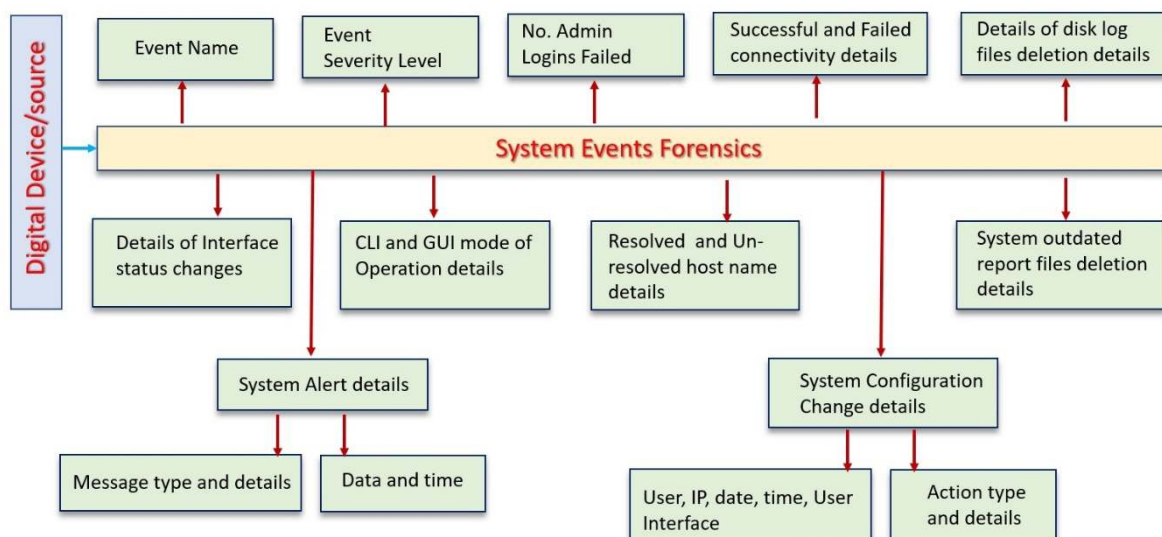


Figure-4: System Events Forensics

4. Application Visibility and Control level Forensics:

It can be used for investigating the high-risk applications identified the sources of networking environment. Investigator can find the details pertaining to the data compromise, network intrusion including the network performance-based information. Applications with a high risk are required to be observed here. [17] These applications have the risk rating based on the severity in the risk. These applications are respective category, technology, number of users, total bytes and sessions as depicted in Figure-5.

Based on the security setup and networking environment applications are categorized based on the application and its behaviour characteristics, data transmission and the related technology. [18] Investigations in the application visibility and at the control level provides interesting information to generate the reports including application name, users, sessions, bytes transmitted, sessions and its details, application category, its technology, application-level security, behaviour characteristics, total numbers application user details etc. as shown in the Figure-5

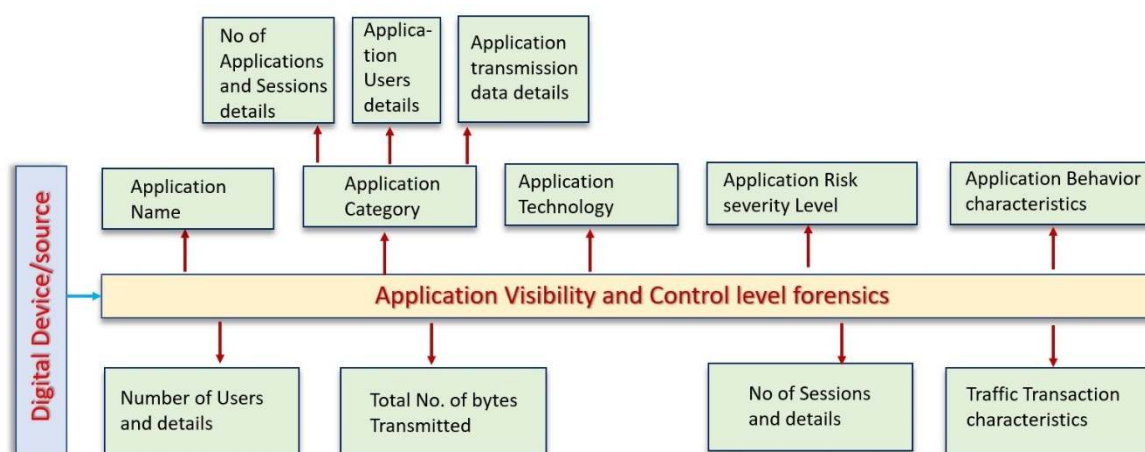


Figure-5: Application Visibility and Control level Forensics

5. Threat Detection Forensics Process

Present malwares are creating great threats. These threats establish a foot-hold within computer environment. Attackers use and steal sensitive information and attack assets. Investigator need to use the data generated by

the firewall, which gives reliable details and traffic controlling details on the network. Sometimes it provides virus, spyware details which useful for detection of various type of threats. [19] In the Threat detection forensic process, investigator can study the

Threat Names, types, its technology, sources of threats, data leak, domain, IP, malicious files, threat severity, traffics transaction,

upload and download information etc; as shown in the Figure-6.

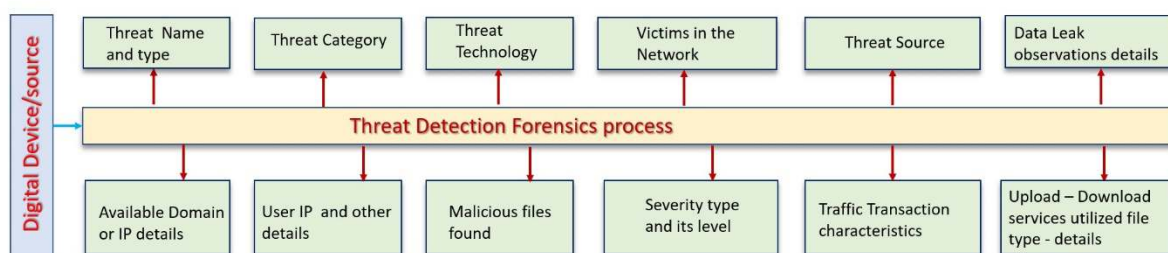


Figure-6: Threat detection forensics

6. Application Categories on Network and its Forensics

As shown in the Figure-7, application categories on network provides very useful details of web client, network services, proxy social media, remote access and its related

information.[20] It is also a useful methodology for obtaining information, Client-Server-based details, of Botnet, mobile, browser-based detailed like audio/video, network protocol-based information etc. [24]

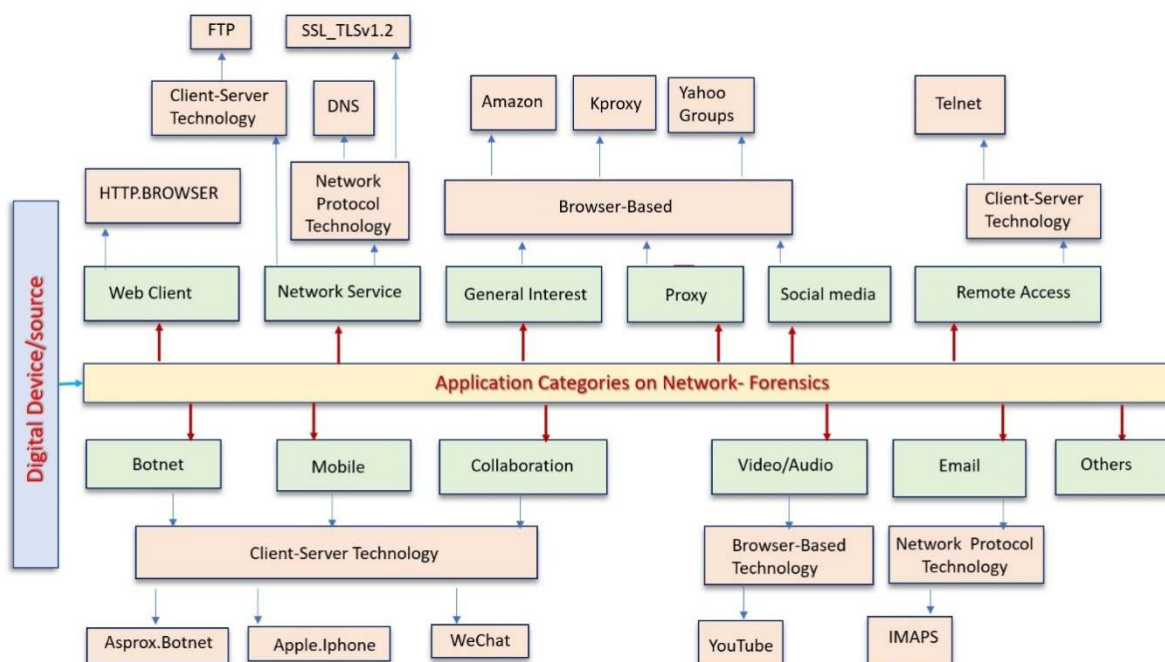


Figure-7: Application Categories on Network and its Forensics

7. Web Categories on Network Forensics

In Web applications, users allowed to submit and retrieve web-content over the public or private networks. the security risk based on the type of application; level of security implemented. Threatened are due to vulnerability in the web applications. [20] These applications are exploited by attackers using various attacking techniques.

Investigator can Identify various web categories and websites, which are accessed by applications. This information gives network traffic transmission details. It is also possible to understand the security details of

the application including filtering policies. Based on the type of security devices will have various types of web categories in their databases.[21]

As shown in the Figures-8 the Investigator can observe web browsing logs and its activities which covers web site category, time stamp, security action, bandwidth details, frequent, top visitors etc. [23] Through the Web categories on the network which are useful to investigate different types of web hosting, type of websites, blogs, proxy, malicious, unrated, file-sharing, news media etc.

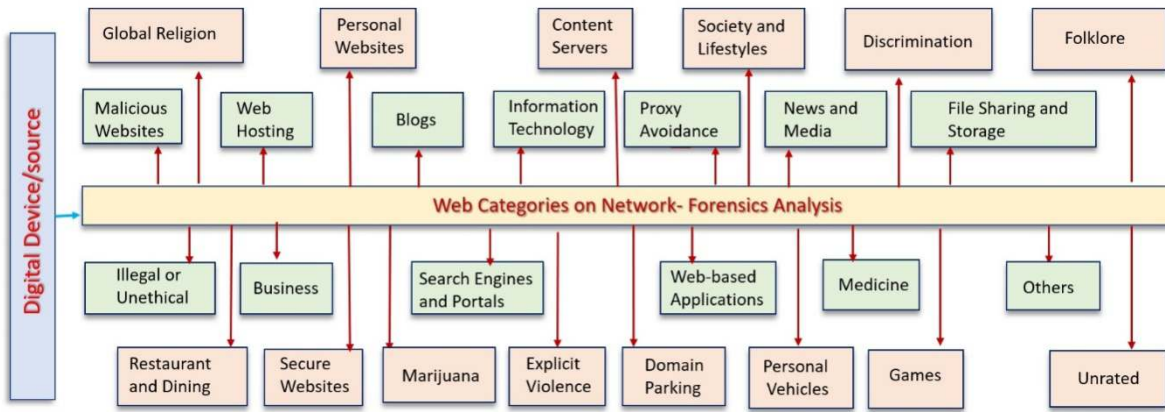


Figure-8: Web Categories on Network and its Forensics

8. Application Traffic by bandwidth, sessions, categories on network forensics

It is useful to study the application traffic usage based on the bandwidth consumption and sessions. As stated in the figures-9, it is a basic observation of applications like https, ftp, ntp, tcp, web hosting, blogs, ssh etc.,

usage is mainly depends upon various factors like type of users, organizational data traffic. [3] [24] Top users of the application along with bandwidth consumption and visited sites detail give valuable data for investigation. [25] Application categories need to be investigated for better results.

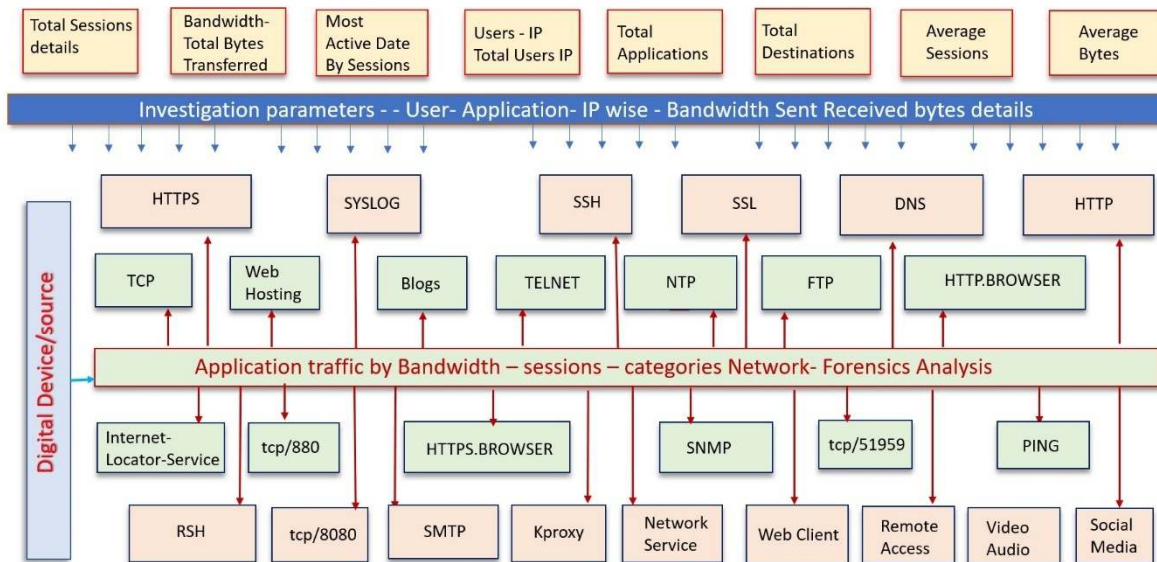


Figure-9: Application traffic by bandwidth, sessions, categories on network and its forensics

9. File usage and its ActivitiesForensics

In file usage methodology,threat and security investigation provides details like IPS attacks high risk applications malware and also malicious web site detection details. In user productivity investigation process application

types, used applications website categories and network details covers bandwidth wise information, used application information etc.[15][26] This methodology is useful to investigate the file usage and its related activities as shown in Figure-10.

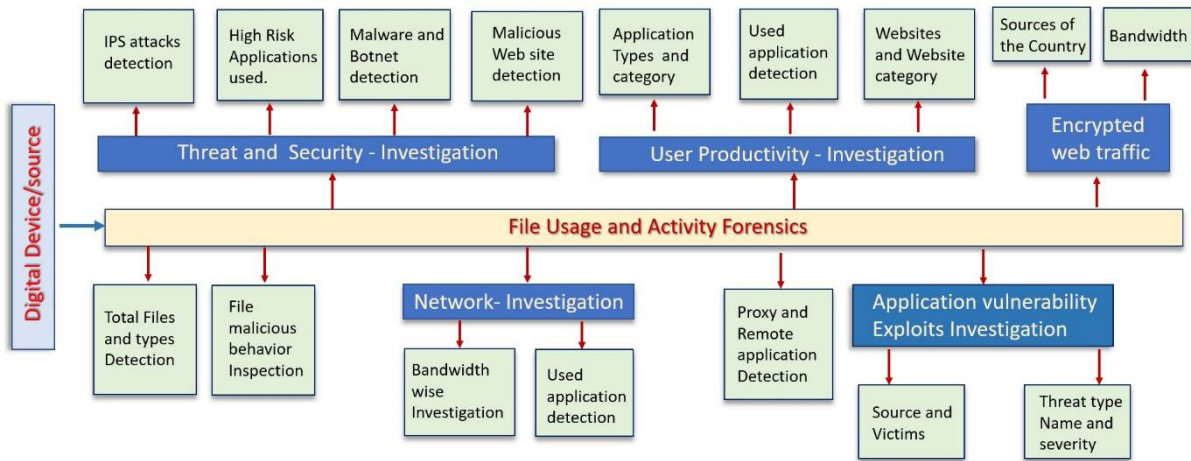


Figure-10: File usage and its activities forensics

10. Data Violation, Data Leak Forensics

By exploring various parameters as shown in Figure-11, the data violation and data leak information of any security digital devices in the network reveals required information for detecting and investigating the web-based

violations, FTP rule-based violations, e-mail-based violations etc. IP information, malicious files, violation severity levels, traffic transactions, upload, download details can be utilized for forensic analysis. [14]

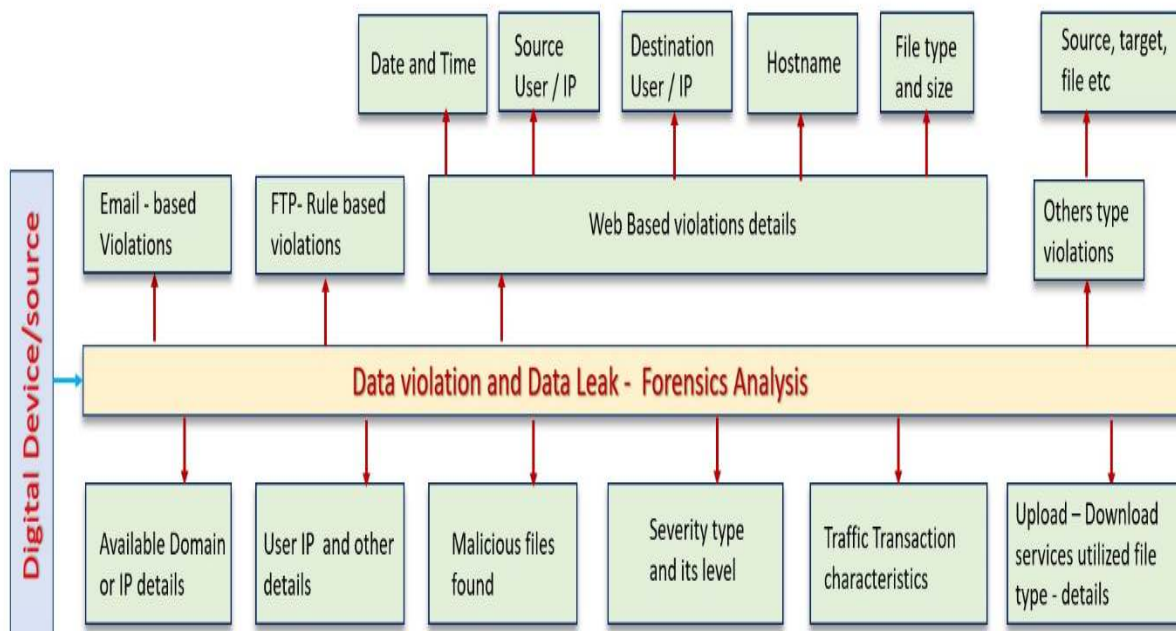


Figure-11: Data violation, data leak forensics

11. Application Usage Forensics

In the Application Usage Forensics, various details of remote access, email, backup, malware, proxy-based applications, peer to

peer information and other related information can be explored as depicted in figure-12. [27]

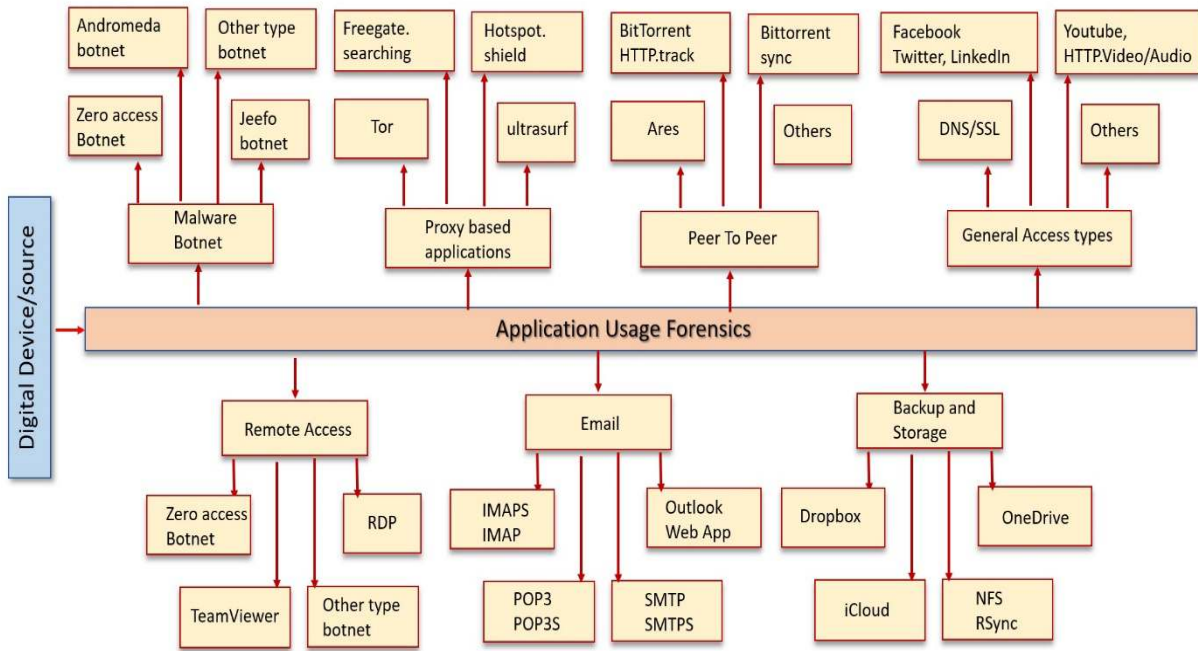


Figure-12: Application Usage Forensics

12. General Items Forensics

General parameters in various digital devices provide vital information to the investigators. The general items forensics methodology shown in figure-13. By obtaining details like DNS logs, email sender,

recipient, end-point PC details, vulnerabilities details of systems in LAN, risk details stored in any digital device of the networking environment, application-level vulnerabilities etc. are essential to handle forensics of the network.[17]

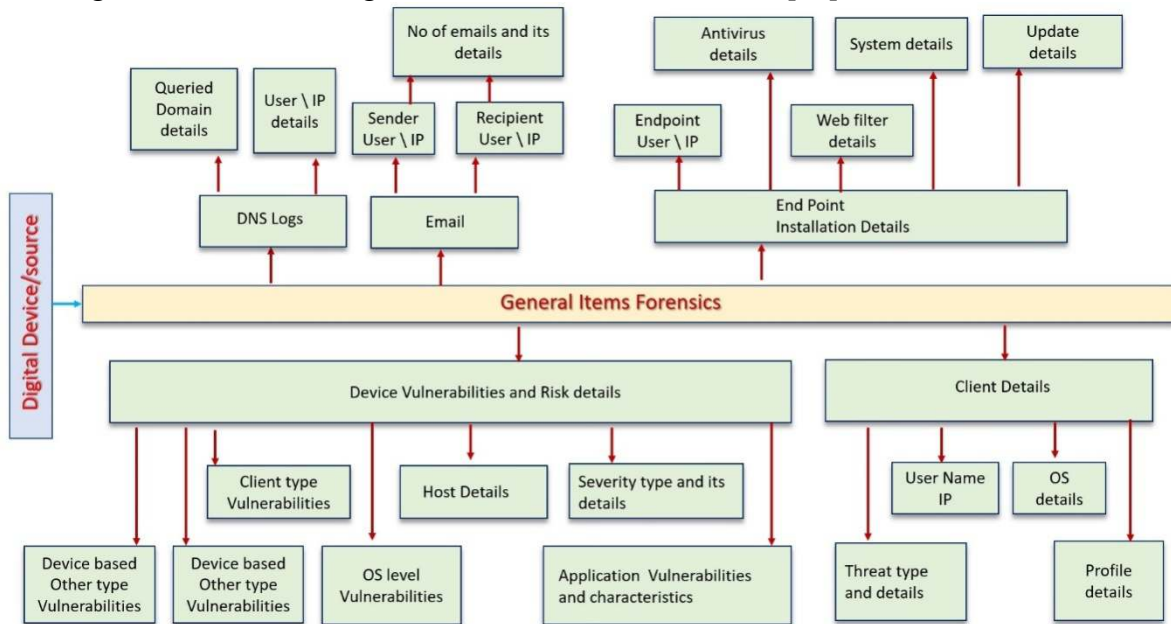


Figure-13: General Items Forensics

13. Resource usage, IPS, IDS and its Forensics

As specified in Figure-14, a strategic plan is required to acquire the information from the

digital sources of IDS, IPS data from the security devices, can be utilized by the investigator to acquire useful data for forensic analysis. [22]

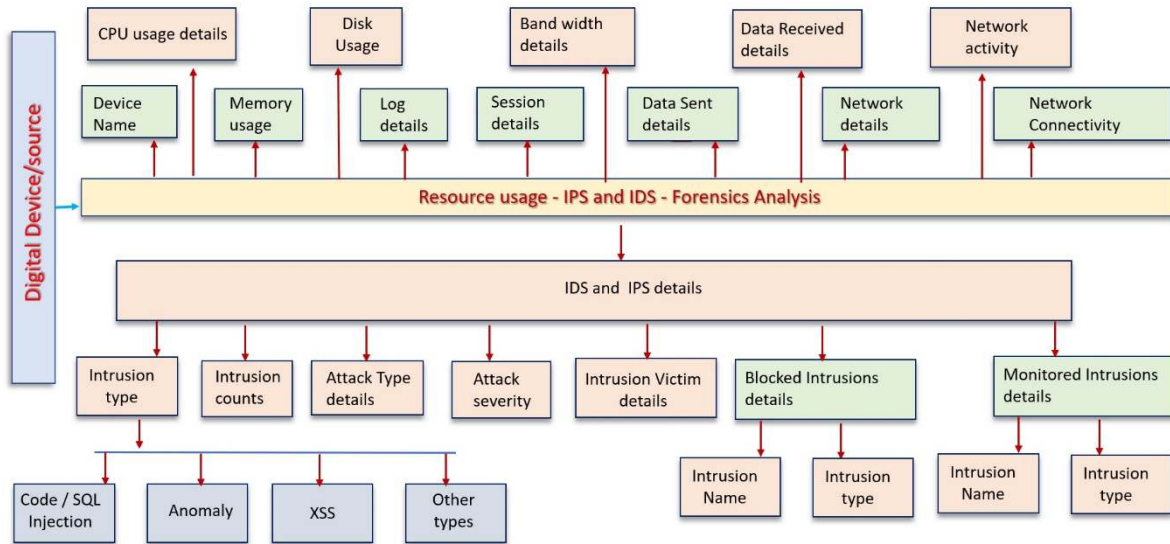


Figure-14: Resource usage, IPS, IDS and its Forensics

14. Network Activity and its Security Information Forensics

Major role of an investigator is to acquire the most reliable and inter-related information in a networking environment which is a highly challenging task. [15] This needs a systematic approach for obtaining

information. By utilizing the methodology mentioned in Figure-15, which provides Wi-Fi client, web-usage, DHCP, applications and sessions, bandwidth usage and traffic utilization etc., can provide suitable information from this framework for handling the forensics data analysis.

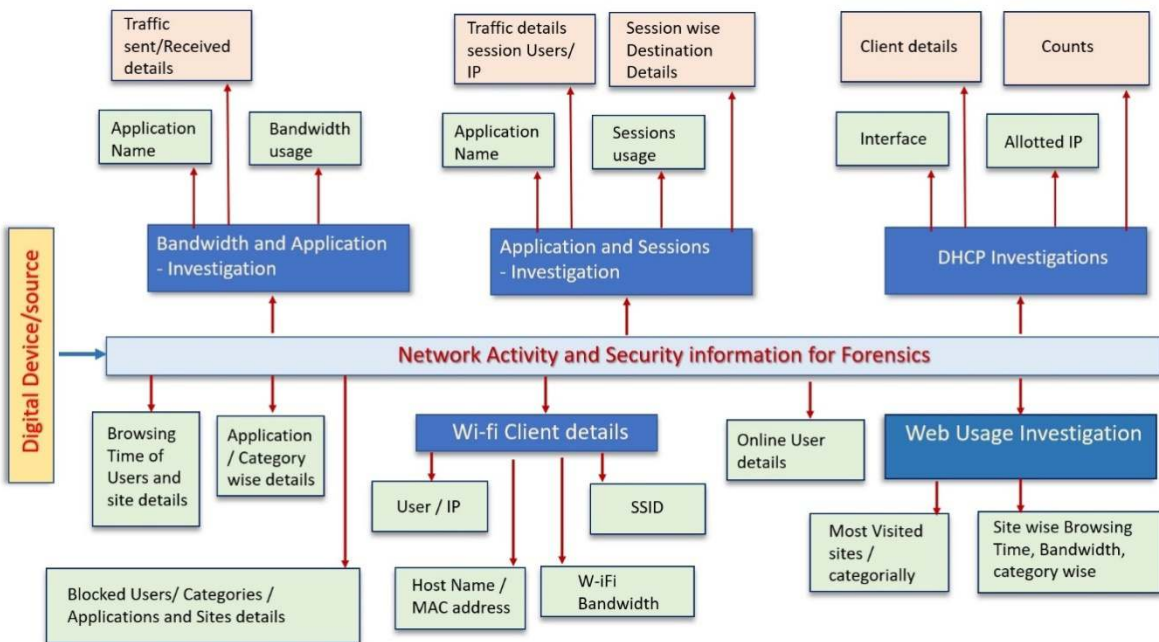


Figure-15: Network activity and its security information forensics

15. Wi-Fi Network Activity and its Forensics

Now-a-days many users are utilizing the Wi-Fi for their communication system. By exploring the data for the devices various information can be obtained such as

data transferred by clients, device particulars, network interfacing, applications usage, SSID usage etc as shown in Figure-16. By obtaining these parameters which will be useful for the investigator for proceeding forensics analysis. [15] [16]

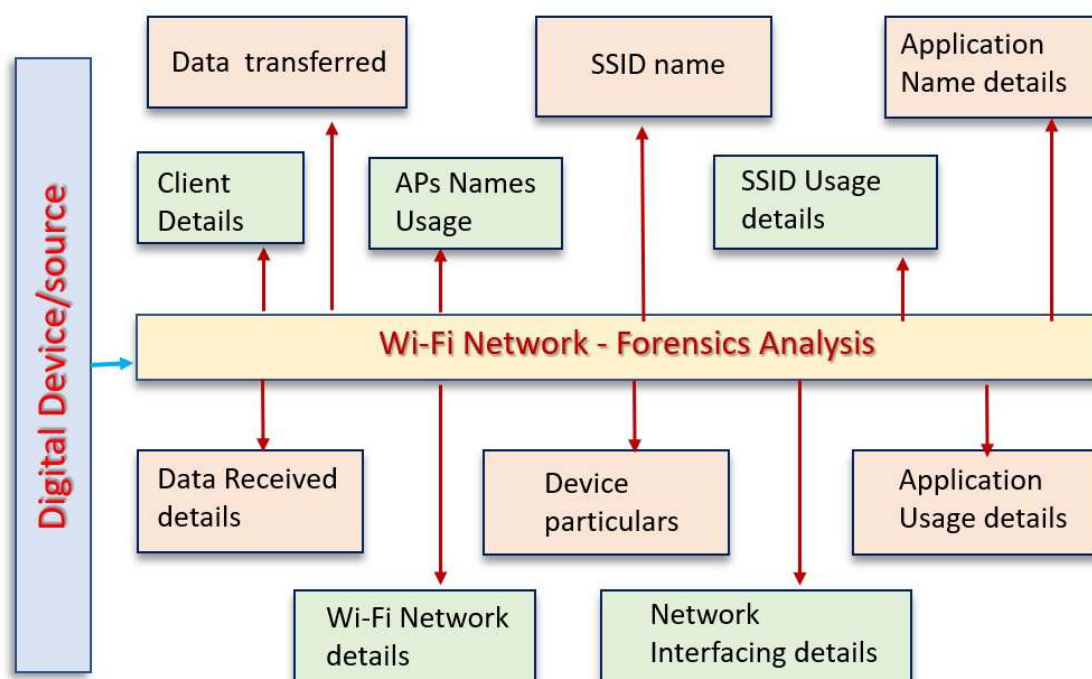


Figure-16: Wi-Fi Network Activity its Forensics

Computer Forensic Laboratory

A computer Forensic Laboratory is used to conduct Forensic Investigations, store the acquired digital evidences, analysis and other related work. [1] It is necessary to understand the required Lab Space, Requirement of the Hardware and Software tool for establishing a good Computer Forensics Lab. It is also necessary to obtain training on regular basis including the technology upgradation and required procedures. It is also necessary to obtain the commercial digital forensics tools along with the open-source tools for better compatibility for investigations. Portable computer for investigators is suitable for live forensics and data analysis at crime scene location.[27] This Labs need to have the latest digital forensics hardware and software tools. Acquired digital evidences are analysed by the

Investigators to prepare the detailed report on the findings. [29].

Conclusion

Digital Forensics is an emerging field in digital world. It has become inevitable to deploy various strategies to identify the cyber-crimes through diversified techniques specified in this paper. This paper gives an impetus to investigatory authorities and agencies to detect the cyber crimes and the applications helped to acquire vast spectrum of data forensics. It has become necessary to establish sophisticated state-of-the-art technology-oriented Computer Forensics Laboratory. Which acts as a hub of different activities associated with cyber-crimes Forensics. It acts as a repository of evidences collected from multi-faceted and multi sourced Forensic Techniques.

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DEMOGRAPHIC VARIABLES AND TECHNOSTRESS IMPACTING THE WORK-LIFE INTEGRATION OF INDIAN WOMEN ACADEMICIANS**Minakshi Sehrawat¹, Bhavesh J Parmar²**¹Research Scholar, SankalChand Patel University, Gujarat Assistant Professor, TheNorthCap University, Gurugram²Assistant Professor, Charusat University, Gujarat**ABSTRACT**

Teaching profession seems to be under siege. In the past few years, working hours of teachers have substantially increased and become complexed due to added administrative and paperwork burden. A study by McKinsey suggests that on an average a teacher is working for 50 hours a week which is 3% higher over the past five years as indicated by OECD Teaching and Learning Survey. Well, given the mounting work pressure, turnover of teachers is on alarming rate and with 81% percent academicians are considering changing their profession. Meanwhile, educational Institutions have increasingly become dependent on technology for delivering choices, variability, and the ability to switch. Ranging from the evolved teaching pedagogies, virtual learning, and online conferencing to AI-enabled proctoring, evaluation this agile wave of e technology has increased cadence to deliver better results vis a vis altered the equation of work-life integration followed by techno-stress. Further, the level of impact is again linked to gender, age, technology awareness, parental status, organizational policies, work culture practices, support from family, friends, and colleagues, etc. This study focuses on identifying, and understanding, the macro, meso, and micro factors causing techno-stress among woman academicians. Further, it will establish the relations between technology and techno-stress through numbers, figures, and statistics carved out of data collected from 600 women academicians in North India.

Keywords: *Technology, Women Academicians, Techno-Stress, Work-Life Integration, Work-Life Balance*

Objectives:

- To identify and understand the macro, meso and micro factors causing techno-stress among woman academicians.
- To establish the relations between technology and techno-stress based on the empirical data collected.

1. Introduction

Organizations employ men and women with lives outside their workplace. Changing demographic and economic conditions have shaped the salience of work and family life. Rising cases of dual-earning families, single-parent households, intensification of work demands, advancement of communication channels, have raised concerns of the workforce. Technology and ICT has made it possible to stay connected and reporting to work, hence the issue has become a pressing concern for men, women, their families and also the organizations as well. Compared to earlier studies where work and life were seen as the conflicting issues, new studies have evolved the concept of balancing and then integrating the two.

The percentage of women in workforce continues to increase (Hibbert & Meager, 2003). In this scenario, the

traditional way of handling things tends to overlook the growing diversity of workforce. Given the fact that a few working women have the backing of full-time homemakers while they are on job. Women are majorly seen as the prime care taker of the family and have to answer to household responsibilities and commitments too. They would like to take up opportunities and job roles wherein they could be left with the energy and time to spend with their family and partake in other activities too. In cases where both the partners are working, the traditional mother-father role cannot exist rather it is co-parenting. However, they might conquer through a lot of calendar coordination along the way. The idea of sharing work at home and home at work are the new norms. Parents don't mind to involve their kids in their career related tasks, showing presentations, asking opinions, taking along them on business trips, if they

can. This help their kids to grow learning things by viewing and help their parents balance the aspect of work and life. Job of an academician traditionally considered as the foremost choice of those, be it men or women, who needs some extra space between work and family responsibilities. For instance, there is nowhere parallel number of examples of bringing kids to work place for any other profession. By the changing scenario of world, online appearance of teaching assistantship has raised challenges and answered questions at the same time. Increased use of technology and enabling ICT infrastructure has posed challenges along with the flexibility offered. A research by Accenture says that 70% of women in India says that work-life is balance is important for their success in career while only 40% of the men felt the same. This study also indicates that difficulty is managing between the two is the key reason why women leave their jobs in India. The finding further says that 48% of the women quit their jobs due to long and inflexible working schedules while the same percentage for their male counterparts is just 24%. (Malhotra, WSL, 2013).

2. Literature Review:

Techno-stress causes employee burnout, decrease productivity, engagement and lower their creativity. Research studies done on 2000 employees have cited lack of tech reliability (46%) as the main cause, followed by increased workload led by technology (45%), tighter deadlines (33%) and lack of human interaction (29%). (Watson, 2019). Also, 27% said technology led longer working hours to them, 19% have delayed the work while 15% delegated the work. Watson also found that this stress factor is higher upto 20% in workers of 55 year and above age while the same is merely 9% in survey population of 18-24 age group.(Watson, 2019)

Amid the recent pandemic scenario, everything including working, studying, socializing, or even seeing a doctor get dependent on tech devices. Compared to 1984, when merely the command to bold the text used to give tech-frustration, today's rising demand of tech devices prevent night sleep, turn employees into cynical and

exhausted. As per global well-being survey, 84% employees feel stressed and 13% consider the level of stress unmanageable that led to compulsive disorders and addictions. (Pawel Korzynski, 2020)

Faculty members are deeply anxious and facing technology led burnouts. As per the research studies conducted by The Chronicle and Fidelity, out of 1122 faculty members, 75 percent said that their workload has increased multiple times and WLI has deteriorated badly. It could destabilize the teaching as a career choice and impact women the most as teachers. It is due to disproportionally shunting of domestic and child care duties on women's shoulder when colleges go remote. Further, indicated by chronicle, students need more support and teaching is now taking more time. Meanwhile, faculty have little or no time to produce research, use grants and fellowships. (Pettit, 2021)

According to Harvard Business Review, extending working hours seems to be necessary for professional success. Around 190 billion dollars each year are spent to address the physical and psychological work-related burnouts. (Bell, 2021)

Level of Factors affecting Work-Life Integration

Moderating variables are studied under these three levels: Micro, Meso and Macro Level.

Microlevel factors-

Individual differences and family situations/ circumstances have direct influence on work-life integration and the use of technology. Attitude of individual or family towards the perceived use of technology also drive their behaviour and construct for work-life integration.

Gender-

Pleck (1977) proposed that traditional expectations attached to gender role leads to contradictory patterns of experiences between women and men in work-family conflicts. Women are perceived as the prime care taker of the family, kids and other house hold responsibilities as compared to their male counterparts. Subsequent studies point that teleworking women respond to family related demands more frequently than men, hence intersperse their paid work with non-paid

work. Also, attention, emotions and absorption required in each role are tightly linked to women (Rothbard 2001). To the extent ICT has penetrated into the different roles, it is possible that it has strongly affected the women than for men. This angle is found consistent with that the technology use creates more work-family conflict for women than for men (Valcour&Batt, 2003)

Parental Status-

Studies point that use of technology varies between the couples- with or without parents. Parents are significantly more likely to use ICT based communication to connect with their children or elderly people as compared to non-parents. Here in the parents whose children are pre-school, primary or school based are more dependent on technology to see their wards well-functioning. Such people encounter more situations of work-life conflicts. Within the home, technology has negatively affected family interaction and functioning (Watt & White, 1999). For instance, introduction of computer, mobile phones and other smart devices had decreased family-interaction as well as sleep time while increased time spending alone. (Venkatesh&Vitalari, 1987)

Personality-

Researches indicate that self-efficacy is the foremost predicative of individual's engagement and adjustment to the virtual form of work. Its extent is also dependent on the structural, planned and organised behaviour of individual in executing their work day responsibilities. The studies show that individuals with high self-efficacy are more able to adjust with the challenges of handling paid and non-paid activities at one time. They are more likely to employ strategies to meet the demands and distribution of work with respect to time and space and therefore can achieve comparatively higher integration of work-life. (Raghuram. et. Al, 2003)

Individuals whose family identities are more salient are may fare better in term of work-life integration for two reasons- because they may find family related work interruption less likely to interrupt during home-based work and also because their visibility and social rewards with respect to

work are higher in office environment. (Standen et al., 1999). Moreover, technology related surveillance and monitoring is related to high job stress, exhaustion and burnouts which in turn lower the work-life integration.

Meso Level Factors-

Both organisational and sub-organisational level factors come under meso level.

Organisational Policies and Culture w.r.t Work Life Integration-

Information and Communication Technology along with organisational culture and practices also govern the work-life integration which includes work-life flexibility, benefits attached, given discretion and autonomy, adequate incentives, compensation, Human Resource Culture that values and support work and non-work lives of employees. (Valcour&Batt, 2003). Some of the organisational benefits heralded under the banner names of flexitime, job sharing, part-time, freelancing, work from home, job sharing, family leaves, dependent care time, volunteering holidays, compressed work weeks, four-day work track, flexi place etc have been scheduled to increase work efficiency of the employees. For some employees, particularly, white collared, facilities like portable computer, or PC or Tablet; Smartphones, and other facilities are given to enable them a choice-based operation with respect to time and space. This shows that work-life policies moderates work-life integration and facilitates the aspects of technology along with this.

Work-Culture Practices and Coordination demands-

Whether the work itself is of independent or interdependent nature, also render employees to operate dependently or independently from each other. For instance, employees in self-managing group where one can easily take temporary responsibility of the other, allow individuals to well accommodate the demands of family domains. Such individuals are likely to feel lesser exhausted with work and more satisfied with work-life integration. (Barg, et. Al, 2003)

Another thing is demand of coordination required also effects the relationship between technology and employees experience against it in maintaining integration. ICT has been

observed as a multidimensional variable, whose five identified dimensions are-

- i. The degree to which ICT connects workers to the job
- ii. The time distribution between the work and the home
- iii. The extent to which job requires communication with other employees
- iv. The volume of communication with clients or other external parties
- v. The degree of autonomy experienced by routine and professional teleworkers.

Hereby, the nature of connection between the employee with the organisation, seniors, subordinates, peers and clients affects the degree of flexibility. When the demands for continuous communication and coordination are quite high, then integration of work-life becomes more challenging and therefore, work-family conflicts are likely to rise. (Batt&Valcour, 2003). Some other researchers have fingered for lower work-life integration when there is a great proportion of time spent with technology, or telecommuting.

Supervisor Supportiveness-

For the employees whom they report to, play an important role in setting overall tone and expectation work and life. In many cases, supervisors have authority to deny or allow the flexible use of technology for the employee to help him make use of technology in most effective way. A supportive employee can allow flexibility through work-place policies while unsupportive supervisors subvert family friendly policies. (Eaten, 2003)

Underlying that overall organisational policies, work-culture practices and supervisor supportiveness moderate the extent to which technology facilitates either conflict or integration. For instance, when the condition of non-availability through ICT is non-negotiable, the technology exacerbate work-life conflict, otherwise it can be relatively liberating.

Macro-Level Factors-

Factors at this level, though did not determine the outcome but they bound the range of possibilities and influence the

deployment of technology use. Consider some below-

Regulation of work-

Defining and regulation of labour policies, overtime pay, compensatory work policies etc have the potential for making direct impact on work-life integration. For instance, employees will begin to use ICT outside work hour and/or place settings, if he/she will have been paid bills by the organisation for that extra effort. These employees might see extra pressure for work and lesser extent of work-life integration, on the other side.

Occupation and Class-

Employees occupied in planned/routine jobs are psychologically less engaged with their jobs then the employees in unplanned nature of job, this places the latter in high risk zone of work-family conflict. (Chesleyet. Al, 2003). Higher job -involvement at mental level has a higher tendency to spill over into the family domain. This effect is further intensified with increased use of variety of information and Communication Technology (Mobile, Laptop, Continuous Internet Connectivity, Emails etc).

In some occupations, technology advancement may be accompanied by the expectation of faster work execution and enhanced per day productivity. Meanwhile, employees working with organisations having large and specialised workforce size tends to enjoy more autonomy as compared to the employees with organisations with lesser human capital and labour market power. Occupational performance rises with increased access of ICT in case of academicians. For instance, internet access to research database will allow greater research productivity.

3. Hypothesis:

H01: Technology and Techno-Stress are positively co-related

H02: Work-Life Integration, and Usage of ICT are negatively co-related.

4. Research Methodology-

Data Collected: Primary and Secondary Sources. The data was collected through convenience sampling.

Demographic Profile

Demographic Information		
Age Group	Frequency	%
<=20	27	4.5
21-30	214	35.7
31-40	267	44.5
41-50	92	15.3
Marital status		
Unmarried	216	36.0
Married	354	59.0
Divorced	16	2.7
Separated	5	.8
Widowed	9	1.5
Work Experience		
0-3	132	22.0
3-5	90	15.0
5-10	183	30.5
10-15	106	17.7
Above 15	89	14.8
Role in the Higher Education		
Academic	520	86.7
Non-Academic	80	13.3
Family Type		
Joint	245	40.8
Nuclear	355	59.2
Total	600	100.0

Table: 1

Out of 2000 questionnaires floated via email, the response rate remained 40 %. The data was analyzed using One-way ANOVA, Pearson Product Moment Correlation and t-ratios.

The significant association between the variables is tested through Modeling. The

results have been presented under the following sub-heads:

- Factor analysis
- Reliability analysis
- Confirmatory factor analysis for a factor Technology and Techno-stress

Factor analysis**KMO and Bartlett's Test**

KMO and Bartlett's Test		
ICT and Techno-Stress		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.898
Bartlett's Test of Sphericity	Approx. Chi-Square	2229.317
	Df	21
	Sig.	0.000**

Table 2

KMO & Bartlett's Test of Sphericity is a measure of sampling adequacy that used to check the case to variable ratio for the analysis being conducted. To check the suitability of Components analysis, KMO & Bartlett's Test is applied. Our significant value is $.0000 < .05$ which means that the sample is adequate. The responses collected to the problem are suitable and valid.

Estimated Communalities

All the variables are found with high coefficients the principal components, hence are strong variables

Reliability Analysis

The reliability and validity of Knowledge of Multimedia in Smart classes, Multimedia Attitude, Perceived Self-Confidence and School Climate & Support are discussed in table 4.4

Reliability and validity of the model

Cronbach's alpha value for ICT Techno-Stress is 0.893 which indicates a high level of internal consistency for our scale with this specific sample.

Confirmatory factor analysis (CFA) for a factor Technology and Technostress

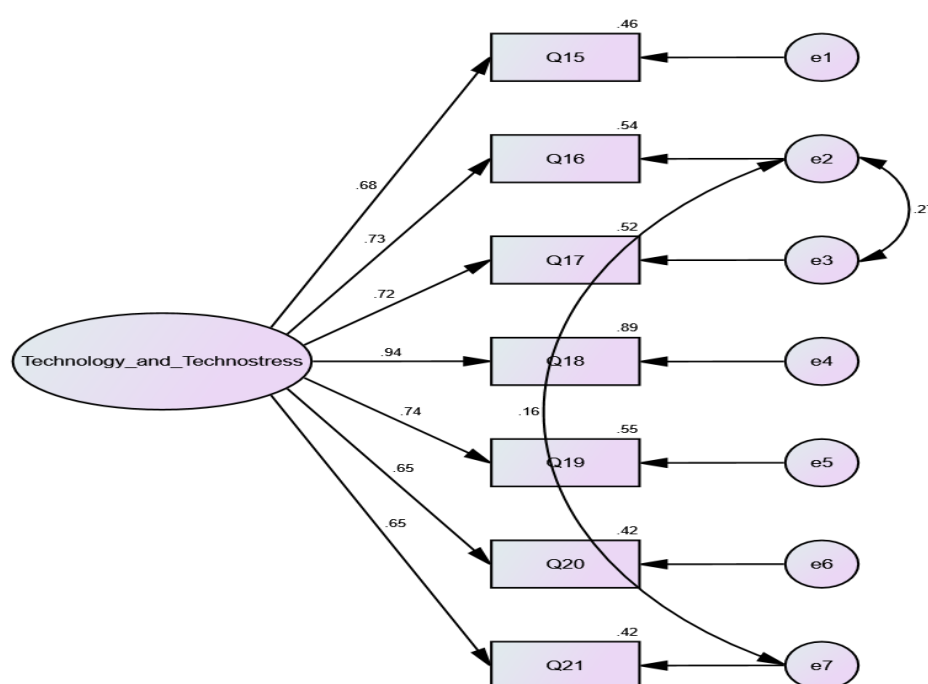


Figure A: Measurement model for Technology and Techno stress before factor loading.

One-factor model for CFA is presented in Figure A in which the latent variable Technology and Techno stress which is shown in the oval shape was predicted as the linear combination of the observed variables shown in rectangles. Every single headed arrow represents the standardized regression weights of the observed variables on underlying latent constructs. The double headed arrows represent the correlation

between the constructs and the values associated with them are the correlation coefficients.

In general, Standardized factor loading must meet these three criteria. First, each factor loading must be more than 0.5, also none of factor loadings must be neither negative nor more than one. In figure A, Standardized factor loading is meeting these criteria.

Regression weights for model Technology and Techno stress

Regression weights							
			Standardised Estimate	Unstandardized Estimate	S.E.	C.R.	P
Q15	<---	Technology and Techno stress	0.679	1			
Q16	<---	Technology and Techno stress	0.734	1.049	0.064	16.443	***
Q17	<---	Technology and Techno stress	0.723	1.072	0.066	16.239	***
Q18	<---	Technology and Techno stress	0.943	1.334	0.067	19.978	***
Q19	<---	Technology and Techno stress	0.743	1.091	0.066	16.658	***
Q20	<---	Technology and Techno stress	0.649	0.94	0.064	14.72	***
Q21	<---	Technology and Techno stress	0.648	0.975	0.066	14.685	***

Table: 3

In general, factor loadings and CR (Critical ratios) should be equal to or greater than 0.707 for good convergent validity. From the CFA result of this study, all items of the factor Technology and Techno stress loadings are greater than 0.707. So, it has good convergent validity. It means the items have information of the same factor rather than the other factor.

The estimates or standardized path coefficients were calculated for construct

Covariance and correlation for factors loading Technology and Techno stress

Covariance							Correlation
			Estimate	S.E.	C.R.	P	Estimate
e2	<-->	e3	0.16	0.028	5.792	***	0.274
e2	<-->	e7	0.108	0.028	3.803	***	0.164

Table: 4

The above table represents the covariance and correlation between the variables (Q16, Q17) and (Q16, Q21). There exists statistically significant covariance between the variables

Technology and Techno stress, by keeping one of regression weight as 1 for reference and calculated others according to that. Such as, for factor construct Q15 variable was the reference and weights for Q16, Q17, Q18, Q19, Q20 and Q21 were calculated according to that. All the estimates were predicted with the extreme significance as p-value is less than 0.0001 and hence all resulted in acceptance.

because the p-value is less than the 0.0001 level of significance. The correlation between Q16 and Q17 is 0.274 and Q16 and Q21 is 0.164

Table 4.5.3: Model fit for Technology and Techno stress

CMIN					
Model	NPAR	CMIN	DF	P-VALUE	CMIN/DF
Default model	16	35.542	12	0	2.962
Saturated model	28	0	0		
Independence model	7	2241.165	21	0	106.722
Baseline comparisons					
Model	NFI (Normed fit index)	RFI	IFI (Incremental fit index)	TLI (Tukey-Lewis index)	CFI
	Delta1	rho1	Delta2	rho2	
Default model	0.984	0.972	0.989	0.981	0.989
Saturated model	1		1		1
Independence model	0	0	0	0	0
RMR, GFI					
Model	RMR	GFI	AGFI	PGFI	
Default model	0.03	0.984	0.962	0.422	
Saturated model	0	1			
Independence model	0.598	0.353	0.138	0.265	
RMSEA (root mean square error of approximation)					
Model	RMSEA	LO 90	HI 90	PCLOSE	
Default model	0.057	0.036	0.079	0.264	
Independence model	0.42	0.406	0.435	0	
Parsimony-Adjusted Measures					
Model	PRATIO	PNFI	PCFI		
Default model	0.571	0.562	0.565		
Saturated model	0	0	0		
Independence model	1	0	0		

Table: 5

RMSEA value of 0.057 in this sample indicates an acceptable fit. The GFI value of this sample is 0.98, and AGFI value of this sample is 0.962. Both values are greater than .9, which shows a relatively good fit. The CFI value is greater than 0.9, which also shows a relatively good fit. The other fit indices, NFI and TLI, are also greater than 0.9 for a good fit. Based on these indices, this sample has an acceptable fit to the model.

5. The Findings/Results:

- Technology and Techno-Stress are found

positively co-related. And, increased use of technology due to remote work has exaggerated the negative situation of Work-Life Balance.

- Techno-stress is found to be Inversely proportional with Information and Communication Technology (ICT) Competencies. More the ICT competencies, lesser is the Techno-stress and then, more will be Work-Life Integration.
- Amid the remote work situation, there is no significant mean difference found

between the Technology and Techno stress between Joint family worker and nuclear family worker, and between the women of different marital status. However, the baby boomer women or women with younger children faces more challenges in managing work-life integration than the rest.

- Fear of job-loss, competitiveness in industry and unpredictable future job market have further intensified the issue making the teaching job tougher. Further, the WLI factor for choosing teaching as a profession has lost its relevance in context of current world.
- 92% respondents believe that ICT competencies helped them to save their job while 40% feel that their capacity to do multi-tasking allow them to stay balanced in work and personal life.
- Despite variation in each individual case, common things like- mental involvement,

6. Implications for Theory and Practice:

Research revealed the present situation of Work-Life Integration of Women in Academics. It hinted that the things like email, instant messaging, or social media which were once confined with our office spaces are now spilling over their makeshift

workplaces in the living rooms and bedrooms of the people. It begs the question that if we failed to set boundaries that it will further deteriorate the mental, emotional, and psychological health of people.

‘Always Online’ attitude has led the women academicians to face burnouts, low performance, stress-related leaves, and even take away their quality time spending with kids, family, and friends. HR strategists must take the matter of WLI into cognizance and work out on setting boundaries, wrapping up the day, organizing meeting time, offering flexibility to women according to their life span requirements. More, employers shall not expect the staff to respond outside the usual working day and there must be strict ‘switch-off mode from work.

Teams shall be trained in such a way that people shall be aware of what time is right for the recipient. Organizations shall educate the employees about the importance of ‘screen-free intervals, meditations, and learning the onset of burnouts. Overall, technology shall not take away the right of people to integrate work and life optimally. Education, encouragement, and behavioral interventions from the top can let the academicians to Switch-Off to Switch-On for the next time.

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HOW MIGHT COVID-19 IMPACT FUTURE K-12 BIOLOGY CURRICULA: PARADIGM AND PRINCIPLES

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ABSTRACT

Learning about Covid-19 involves some biological science understanding. So, in light of the pandemic, school-based biological science curricula will need to be reassessed. In response to Covid-19, this research paper suggests curriculum building ideas gives a context to modify them. It won't be long until it becomes a historical case study. Rather than focusing on the specifics of the Covid-19 instance, it is essential to focus on the fundamentals of biological science. The biological science K-12 curricula are frequently utilised to teach public health. But education policymakers should be aware that knowledge alone does not always lead to healthy behaviour.

Keywords: COVID-19, Biological science, K-12, Curriculum

INTRODUCTION

When the Covid-19 pandemic breaks out, it's going to have a significant impact on many aspects of life, including schooling. While serving on the teacher education and education Curriculum Programmes team at Sikkim University and as a biological science teacher and teacher educator for more than two decades, I have studied and taught to the various boards of K-12, biological science curricula, including national curricula in India (i.e., CBSE & ICSE). As a result, my attention is drawn to "intended curricula," which are those that articulate a Ministry of Education's or similar body's expectations for what biology students should study (the TIMSS curriculum model, Mullis and Martin 2013, 2019).

There are currently essential in every biological science K-12 curriculum that I have worked on Because society-altering, future curriculum make specific to Most biological science principles will be more vividly contextualised if this technique is successful. Covid-19 may become the exclusive emphasis of biology courses at the expense of other essential topics like ecology, plant sciences, and non-communicable diseases if implemented haphazardly. Curricula based on Covid-19, however, run the risk of swiftly becoming out of date as the becomes warns curriculum designers about two ideas of curriculum design that in the future iteration of biological science courses of K-12.

Principals and Paradigm of K-12 Biological Science Curriculum

The most critical concerns are to be solved through Biological science After COVID-19 losing ground in the global communities due to a lack of basic public health skills. A Framework for K-12 Biological Science education suggests that it will captivate students' interest and give them the necessary core knowledge in the disciplined environment and public health.

A new framework for K-12 Biological Science offers broad expectations for students. These expectations will guide the development of new K-12 science standards and curriculum, instruction, assessment, and educator professional development. These three dimensions express the essential ideas and practices underpinning biological science teaching in these grades or classes. In Biological Science or life science applications, these three dimensions are crosscutting concepts that integrate Biological Science study with multidisciplinary core ideas. The main goal is for all high school graduates/students to be knowledgeable enough in Biological Science to participate in public debates, evaluate scientific and technological information critically, and pursue vocations of their choice.

A Framework for K-12 Scientific Education is the first stage to improve science education and learning across the country. These include educators who teach science in infor-

mal settings as well as those who formulate standards.

1. **The curriculum should emphasise** the most significant features of each subject and be updated as infrequently as feasible to reflect new information or technology. Creating a curriculum is never straightforward, specific knowledge group will result if there is an abundance of it. In contrast, a dearth of the material increases the risk of missing critical understandings, knowledge, and abilities, diminishing curriculum rights (Oates 2011). When progression pathways are poorly described, they might lead to repetition or gaps instead of the desired spiral (Bruner 1960). Teachers can no longer repurpose tried-and-true teachings due to curriculum modifications that keep things "modern" and "relevant." As a result, curriculum adjustments have an opportunity cost and a financial penalty (Oates 2011).
2. **Potent knowledge:** The educators and health professionals suggested that a curriculum built around very effective or robust fundamental principles that help students see the world from many perspectives, have access to more trustworthy explanations for the events of the world, and communicate with one another in intellectual disputes (Young 2008). Even though, for example, biological science "powerful knowledge" about the illness before exposure or vaccine, and so on; likelihood illnesses are altering the nature of human-to-human contacts. Therefore, Covid-19 does not need to be offered as a new "idea," but rather comprehending implementing strong if similar assertions are already available in biology curricula. Instead of reissuing the original curriculum, it could be accomplished; by examining the implementation methodologies such as lesson plans, different activities on health awareness and textbooks and assessment questions. Exploring the content tested by TIMSS for students in Class 4 to 8 is a straightforward approach to review multiple scientific curricula at once. Each participating country's scientific education consulted extensively with and studied the TIMSS (Ina et al., 2017) technique. This

research yields an assessment framework by focusing on consensus and describing educational goals significant to many countries. One of the life science topics included by the (Ina et al., 2017) evaluation framework is "Human Health" (Mullis et al., 2016). In class 4 (primary), students should comprehend how diseases spread, prevent them, and recognise the signs. Prevent disease transmission by identifying or describing techniques such as immunisation, hand washing, and avoiding sick people; recognising Students in class 11 and 12 (Secondary and senior secondary) also required to have a basic understanding of disease transmission and prevention, as well as the causes of disease and the immune response to it.

3. **Topics on awareness on diseases spread and how to prevent:** Describe how common diseases spread and how to avoid influenza; what function does the immune system play in preventing illness and mending the body. When it comes to the ideas most important to Covid-19, curriculum providers will have their curricula to analyse. Still, the TIMSS assessment framework's consensus statements suggest that many curricula currently incorporate the most relevant concepts relating to human health (perhaps excepting zoonosis). There should be no crucial notions removed, and developers should remedy this. Even yet, many curricula will only require minor revisions in the next version, such as, if desired, the addition of Covid-19 as a specific example rather than complete overhauls.
4. **Revision of Biological Science curriculum:** Refining if changes to the underlying curriculum are kept to a minimum. It is up to individual teachers to execute the curriculum, numerous of which can provide students principles to put what they have learned to use. By way of illustration, after students have a firm grasp on the idea of herd immunity, they can debate the hotly contested ethical issues surrounding herd immunity-based approaches to controlling communicable illnesses. For example, if students are familiar with vaccine development principles, they can

think about the biological and ethical implications of using examine to encourage the spread of zoonotic illnesses when discussing human influences on the environment. They might also look at the environmental impact of modern humans' worldwide slowdown, which has "andropause".

5. **Teaching public health can be through the biological Science curriculum;** however, having the information does not ensure behavioural change. Including public health messaging in national (or similar) school curricula is an appealing option since it transmits locally relevant information to all children, regardless of geography or socio-economic status. Although awareness of public health concerns can lead to healthier behaviours, impact studies demonstrate that this information is not always followed by those behaviours changing themes, such as prevention of specific illnesses like H.I.V., might be considered relevant to a curriculum. Several public health strategies are evaluated in a **metareview** to see how effective they were. The researchers noted that "while many therapies presently involve educational components, few seek to evaluate their success" due to this—curricula-based interventions on enhancing particularly during periods on intake fruits where outcomes have been measured, however, in interventions aimed at reducing or preventing teen smoking and illegal drug use, information alone to be insufficient to alter behaviour. The most effective competence battle was dealing with anxiety in their research on drug use normative.
6. **Designers make** the mistake of assuming that simply knowing public health messages will be enough to get students to behave healthily. That being said, it is acceptable to presume that choosing healthy

decisions necessitates information. Along with determinants, varying populations according to new data from the Covid-19 epidemic.

7. **Challenges in future Biological Science:** curriculum There may be particular challenges such as prevalent diseases that can, if national curriculum designers cooperate, professionals. Despite this, school(K-12) curriculum cannot keep pace with fast-evolving public health challenges, even if they are excellent vehicles for disseminating knowledge that supports healthy life patterns. A similar method would be used in the event of another epidemic of similar or higher intensity, as public health messages were delivered via mass media rather than school curricula. False health messages, misinformation, and hoaxes have been spread alongside legitimate health messages reported, for example (Cellan-Jones 2020). Students should be taught how to evaluate health information and specific skills like effective hand-washing as part of future biological science courses.

Conclusion

The K-12 school biological science courses alone will not be sufficient to ensure and preserve public health. Other areas of biology will receive insufficient attention if attempts are made to revamp the proposed curriculum, such as comprehend specifics. As long as curriculum authors focus define essential, teachers will be free to utilise as they see fit, avoiding this disparity. To make sure that all students can access the curriculum, curriculum developers students regardless of socio-economic status. As students study biology in the K-12 Program, they can better deal with educated decisions about how to use scientific knowledge in real-world situations that would have social, health, or environmental implications.

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WEB TOOLS INTEGRATED LEARNING STRATEGY: A VIABLE PRACTICE FOR SUSTAINING RETENTION OF ACHIEVEMENT IN CHEMISTRY AMONG SECONDARY SCHOOL STUDENTS

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ABSTRACT

The rapid development in ICT has brought revolution in the twenty-first century and has influenced the needs of advanced societies. ICT is becoming progressively significant in education as well as in our everyday lives. Everyday life is inextricably connected to science. Incorporating technology into learning has become a viable and cost-effective option due to its rapid growth and broad variety of applications. In the present study, a Web tools Integrated Learning Strategy for Secondary School Students was developed and its effectiveness tested in enhancing the Retention of Achievement in Chemistry of Secondary School Students. Experimental method with Pretest-Posttest Nonequivalent Group Design was used to conduct the study. Teaching using Web tools Integrated Learning Strategy and Activity Oriented Method were the independent variables. While Retention of Achievement in Chemistry was the dependent variables. The sample composed 280 Secondary School Students. The results of the study showed that the Web tools Integrated Learning Strategy is more effective than the Activity Oriented Method in enhancing Retention of Achievement in Chemistry of the Secondary School Students.

Key Words: Web Tools Integrated Learning Strategy, Retention of Achievement in Chemistry, Secondary School Students

INTRODUCTION

The rapid development in ICT has brought revolution in the twenty-first century and has influenced the needs of advanced societies. ICT is becoming progressively significant in education as well as in our everyday lives. Information and communication technologies (ICT) will perform feats that no one could have expected in today's information era. ICT has had a major impact on our way of life. Traditional teaching methods fail to meet the intellectual, psychological, and emotional needs of students and are ineffective in engaging students in science learning. Teaching strategies must be dramatically modified, and they must become more student-centered. Divergent thinking is a characteristic of modern teaching strategies that lets students learn and maintain knowledge more effectively. Incorporating technology into learning has become a viable and cost-effective option due to its rapid growth and broad variety of applications. Information and communication technology (ICT) can be a powerful change agent in education if used correctly. ICT enabled education is not only a response to the growing demand for educational enrolment, but it also reflects the

attitudes of today's students and aids in meeting information growth challenges.

NEED AND SIGNIFICANCE OF STUDY

ICT will help students improve 21st century skills like digital literacy, imaginative thinking, creativity, critical reasoning, and successful communication. Incorporate ICT with e-Learning, really want to create a holistic learning atmosphere based on quality, innovation, and creativity. Furthermore, teachers are under pressure to finish the syllabus on time, so even a teacher wishes for his students to obtain a thorough understanding of the subject, due to a lack of time, this is unlikely. Other variables are taken into account, such as a diverse group of students and a low teacher-to-student ratio. As a result, the current educational system is wasteful. Chemistry is also known as the fundamental science because it connects physics and mathematics, biology and medicine, and earth and environmental sciences. Understanding the presence of chemicals and chemical processes may assist in the explanation of a variety of physical and biological phenomena. While traditional teaching methods can help to some extent, ICT has the ability to inspire students to deeper and meaningful learning, that means

retentthe science concepts. Retention is the power of the students to remember or retain what they have learned in the class room. Several studies and research papers have shown that teaching science through the medium of technology has a strong and positive association with retention. Several publications have recognized the potential of ICT to promote retention.

Jena (2018) investigated the effect of a neural network artificial intelligence approach on science learning achievement and retention. This research included forty students from a class, and five of them were found to have 60 percent to 80 percent of misconceptions in the misconception test before being exposed to the neural network artificial intelligence approach. As a result, the difference between the mean of the posttest score and the mean of the pretest score was statistically important. It was discovered that the artificial intelligence's output was linked to the input layer and the first hidden layer. Scheffe Several Comparisons of students' pre-, post-, and delayed test scores are revealed. Pretest and posttest and pretest and delayed test mean differences were also significant. This was due to the impact of a neural network artificial intelligence approach on science learning achievement and retention.

Hussain et al. (2017) conducted a study on the effect of information and communication technology on the academic achievement and retention of chemistry students. Fifty 9th grade students were selected at random from Kohsar Public School and College Latamber Karak. The students were divided into similar groups based on their pretest grades. The pretest posttest equivalent groups configuration was used to collect data. For data interpretation, SPSS was used to calculate the mean, standard deviation, and independent t-test. According to statistical research, information and communication technology has a positive impact on students' academic achievement and retention, and ICT has been found to be more persuasive, reliable, and useful in the classroom. It is recommended that information and communication technology should be used in teaching chemistry for enhancing

students' academic achievement at secondary level

Anunobiet al. (2016) examined the Effects of Web-Based Instruction on Junior Secondary School Students' Retention in Basic Technology in Nigeria. A quasi-experimental design was used in this study (pretest-posttest, non-equivalent, non-randomized control group design). 119 Junior Secondary School class two students were chosen from four co-educational registered private secondary schools in Minna Metropolis, Nigeria. Three research questions with corresponding hypotheses were developed and evaluated at a significance level of 0.05. The data was gathered using the Basic Technology Achievement Test (BTAT), a 50-item test of multiple-choice target questions. The BTAT was given to students in experimental and control groups to test the hypotheses, and the data was analysed using Analysis of Covariance (ANCOVA). According to the results of the report, students exposed to Web-Based Instruction retained basic technology values better than those exposed to Conventional Teaching Methods. Based on the above findings it was suggested that Web-Based Instruction should be used to improve students' retention in Basic Technology.

These studies point to the fact that ICT has high significance and immense prospects in shaping the Retention of students in the field of Science education. Proper development of a technology integrated strategy is bound to have profound influence on the Retention of students. Further, it could foster and motivate the students towards learning the subject. Now a plethora of educational web tools available and these tools interactive and making content. Web tools are internet resources that enable users to do more than just receive information from the internet. The user is supposed to communicate with others and create content. Through the use of various web tools the children can understand the concepts clearly and provide an opportunity to respond creatively (**Barber and Cooper, 2012**). Web tools for creating, editing, mixing, sharing, repurposing creative output including videos, audio, text and animation, and also for

simulations should provide back up for the learning (Bower, 2015). Schools could be the best place to use web tools to its full potential. Many educators regard multimedia as a panacea for all educational ills. Several new advances are emerging in the field of teaching chemistry, with ongoing research into teaching chemistry using Web tools. Hence the present study is an attempt to make the teaching of science an interesting one. The present study aims at developing Web Tools Integrated Learning Strategy and test its effectiveness among Secondary School Students.

HYPOTHESIS OF THE STUDY

It was hypothesised that the Web tools Integrated Learning Strategy will be significantly more effective than the Activity Oriented Method in enhancing Retention of Achievement in Chemistry of Secondary School Students.

OBJECTIVES OF THE STUDY

The objective of the study was to compare the effectiveness of the Web tools Integrated Learning Strategy and that of the Activity Oriented Method in enhancing Retention of Achievement in Chemistry among Secondary School Students.

METHODOLOGY

Experimental method with Pre-Test Post-Test Nonequivalent Group Design was used to conduct the study. Teaching using Web tools Integrated Learning Strategy and Activity Oriented Method were the independent variables. While Retention of Achievement in Chemistry was the dependent variables. The sample composed 280 Secondary School Students.

The Materials and Tool used for the study

- Lesson Plans using Web Tools Integrated Learning Strategy
- Lessons Plans using Activity Oriented Method
- Test on Achievement in Chemistry

The Test on Achievement in Chemistry was initially administered to the Experimental and Control Groups in order to assess the level of Achievement of Secondary School Students. The scores obtained were taken as the Pre-Test scores. The Experimental Group was exposed to the Web tools Integrated Learning Strategy while the

Control Group was exposed to the Activity Oriented Method. After experimental treatment, Test on Achievement in Chemistry was again administered on both Experimental and Control Groups. The scores obtained thus were considered as Post-Test scores. One Month after the Post-Test on Achievement in Chemistry, the same Test on Achievement in Chemistry was administered as Delayed Post-Test. The Post-Test and Delayed Post-Test scores of students in the Experimental and Control Groups were tabulated and analysed using statistical techniques like Arithmetic Mean, Standard Deviation and Critical Ratio (Test of Significant Difference between Means).

FINDINGS AND DISCUSSIONS OF RESULTS

A comparison was made of the effectiveness of the Web tools Integrated Learning Strategy and the Activity Oriented Method on the Retention of Achievement in Chemistry of Secondary School Students and the analysis is presented in two parts, viz.

- A. Comparison of the scores of Post -Test on Achievement in Chemistry and Delayed Post-Test on Achievement in Chemistry among Secondary School Students in the Experimental Group
- B. Comparison of the scores Post-Test on Achievement in Chemistry and Delayed Post-Test on Achievement in Chemistry among Secondary School Students in the Control Group

The data was gathered, tabulated, and analysed using statistical measures like Arithmetic Mean, Standard Deviation, Critical Ratio (t-test), Analysis of Variance (ANOVA) and Analysis of Covariance (ANCOVA).

The analysis was conducted as follows.

- A. Comparison of the scores of Post-Test on Achievement in Chemistry and Delayed Post-Test on Achievement in Chemistry among Secondary School Students in the Experimental Group

The Means and Standard Deviations of the Post-Test scores and the Delayed Post-Test scores of the Experimental Group were compared. The data and results of the test of

significance of difference in the Mean scores were computed and the data are given in

Table 1.

Table 1

Data and Results of Test of Significance of Difference between the Post-Test and Delayed Post-Test scores on Achievement in Chemistry of Experimental Group

Type of Test	N	AM	SD	't' value	P
Post - Test	140	26.37	3.13	1.30	P > 0.05
Delayed Post - Test	140	25.87	0.26		

Result: 't' value is not significant at 0.05 level

From Table D, value for significance at $t_{0.05}$ is 1.96

Table 1 shows that, while comparing the Post-Test and Delayed Post-Test scores on Achievement in Chemistry of students of Experimental group, the Critical Ratio obtained is 1.30 which is not significant at 0.05 level. This shows that the Achievement in Chemistry can be retained even after one month by those students who were taught through the strategy based on Web Tools Integrated Learning Strategy.

B. Comparison of the scores of Post-Test on Achievement in

Table 2

Data and Results of Significance of Difference between the Post-Test and Delayed Post Test scores on Achievement in Chemistry of Control Group

Type of Test	N	AM	SD	't' value	P
Post - Test	140	11.94	4.88	8.22	P < 0.01
Delayed Post - Test	140	8.18	0.19		

Result: 't' value is significant at 0.05 level

From Table D, value for significance at $t_{0.01}$ is 2.58

Table 2 shows that, while comparing the Post-Test and Delayed Post-test scores on Achievement in Chemistry of students in the Control group using paired 't' test, the Critical Ratio obtained is 8.22 which is significant at 0.01 level. From the mean scores it is clear that Post-Test score (11.94) is higher than the score of Delayed Post - Test (8.18). This shows that the Achievement in Chemistry after one month of those students who were taught through present

Chemistry and Delayed Post- Test on Achievement in Chemistry among Secondary School Students in the Control Group

The Means and Standard Deviations of the Post-Test scores and the Delayed Post-Test scores of the Control Group were compared. The data and results of the test of significance of difference in the Mean scores were computed and the data are given in Table 2.

Activity Oriented Method is less than that they scored in the post - test..

The above findings establish the fact that the Web Tools integrated Learning Strategy is highly effective in enhancing Retention Capacity of Achievement in Chemistry as compared to the Activity Oriented Method. The Means of Post-Test scores and Delayed Post-Test scores of the Experimental and Control Groups are depicted in Figure 1.

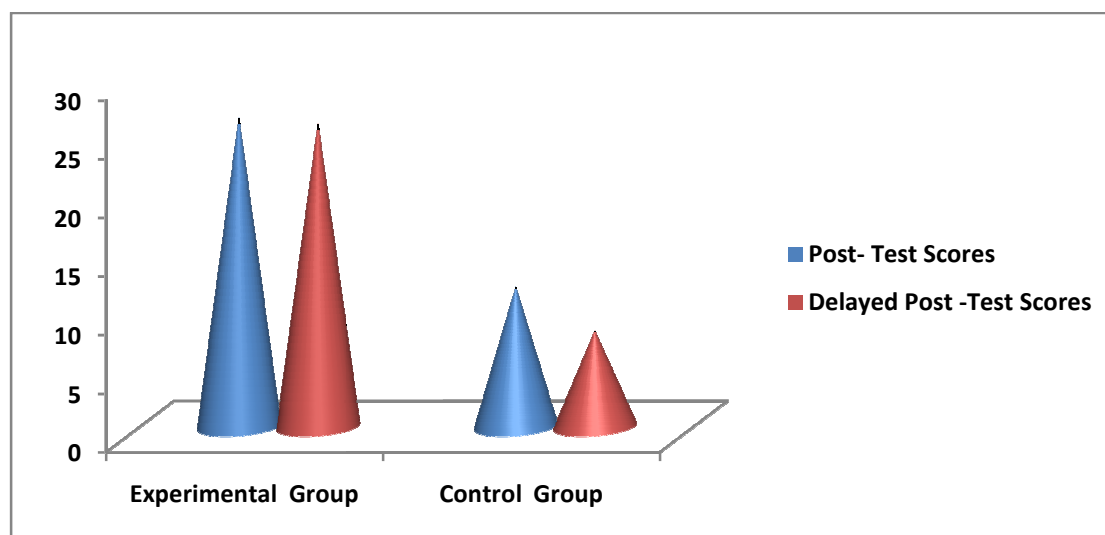


Fig. 1 Graphical Representation of the comparison of Post-Test scores and Delayed Post-Test Scores on Achievement in Chemistry of Experimental and Control groups

Figure 1 shows that the Web Tools integrated Learning Strategy has an advantage of helping the students to retain their Achievement in Chemistry for a long period. Such an advantage is not obvious in the case of the Activity Oriented Method. This gives a clear indication of the effectiveness of the Web Tools integrated Learning Strategy over the Activity Oriented Method for enhancing Achievement in Chemistry.

CONCLUSION

The results of the study show that there is excellent Retention of Achievement in Chemistry among those Secondary School Students in the Experimental Group. Students who were exposed to the Web Tools integrated Learning Strategy have high Retention Capacity as compared to those who were exposed to the Activity Oriented Method. Thus, the Web Tools integrated Learning Strategy developed for the study is very effective in enhancing Retention of Achievement in Chemistry among Secondary School Students. The above findings may be because the Web Tools integrated Learning Strategy could have helped the students to understand concrete ideas and derive many solutions for the problems themselves. Also, the Web Tools activities provided in the strategy could have helped the students to sustain in memory the learnt matter. Usage of Web Tools integrated Learning Strategy has a long term effect in the classroom learning

process. It serves to enhance Retention of Achievement in Chemistry. These findings are supported by the research studies of Gómezpunte and Kroesen (2020), Jena (2018), Hussain et al. (2017), Anunobi et al. (2016) and Kesan and Caliskan (2013) as well as Murali, (2014) and where Retention was seen to be enhanced by using ICT.

EDUCATIONAL IMPLICATIONS OF THE STUDY

The findings of the study have certain educational implications that are outlined below:

- Web Tools integrated Learning Strategy need to be developed so as to provide students deeper and meaningful learning. Such Learning Strategy will help students to be aware of the changes in education arising from technological advances,
- Web Tools integrated Learning Strategy will go a long way in positively influencing the Retention Capacity of the students.
- Digital content using Web Tools that is meaningful, culturally responsive and has high quality must be made available for use of both teachers and students. This will have high prospects for influencing the Retention Capacity of students.
- Web Tools integrated Learning Strategy will help to turn Teacher-Centered lessons into Student-Centered ones. Such a shift in focus is likely to bring about a

vast change in the Retention Capacity of students.

- Web Tools integrated Learning Strategy led to subjective involvement and rising interest and wish in students.
- Web Tools integrated Learning Strategy caused better perception of textbook contents and hence, better retention capacity of the students.
- Web Tools integrated classes will provide teachers with a platform for sharing the subject matter as well as the scope of the feedback.

- The Web Tools integrated Learning Strategy provides a successful platform to convey concepts effectively and help the students to enhance their Retention Capacity. This Strategy also helps to actively participate in the learning process.
- In service and refresher courses should be organized for Secondary School teachers in order to familiarize them with the new trends and patterns of Web Tools with a view to draw out more involvement of students in studies.

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PARENTAL INVOLVEMENT AND SELF-CONFIDENCE AMONG PROSPECTIVE TEACHERS**K. Balasubramanian¹, M. Soundararajan²**¹Research scholar, Department of value education, Tnteu, Chennai-097, balarenusrisai2012@gmail.com²Dean of Faculty, Prof.&Head, Department of value education, Tnteu, Chennai-097, murugumsr@gmail.com**ABSTRACT**

Education is an integral part of human life. Parental involvement with children for an early age has been found to equate with better outcomes. Parents is more important for children's intellectual and social development than parental occupation, education or income. Parents' involvement in home learning activities makes an important difference to children's attainment and social behavior.

*The key goal of the present study importing to identify whether there is any significant relationship between parental involvement and self confidence among student teachers in Trichy district. The present study has been advocated with the survey method. To selecting the sample stratified random sampling has been adopted. 300 student teachers were selected among the student teachers in Trichy district. . Self confidence inventory prepared by **Anderson**(1988) and Parental involvement questionnaire prepared by **Hoover-Dempsey and Sandler's** (1995, 1997) has been used to identify the significant relations among student teachers. The major finding shows that there was a positive relationship between parental involvement and self confidence among student teachers. Positive thinking and emotions such as excitement can greatly improve self confidence helping us to deal with any difficulties. We shall make this a great motivation step to control our feelings and do not let those negative feelings stop us for reaching our goals.*

Key words- Parental Involvement, Self-confidence of prospective teachers

INTRODUCTION

Most children have two main educators in their lives – their parents and their teachers. Parents are the prime educators until the child attends an early years setting or starts school and they remain a major influence on their children's learning throughout school and beyond. The school and parents both have crucial roles to play. Parents are truly the first teachers of their children. This notion is so powerful that there are growing numbers of programmers called Parents as First Teachers around the country. Recent advances in brain research inform us that the first years of life are critical in terms of determining the learning abilities of our children. Much can be done to help parents make the most out of the first years of life. Helping parents understand that their job is to "turn on" receptors in their young children's brains goes a long way towards achieving this goal.

Parents have been thought of as partners in the educational process. Examples of this role are parents helping children with homework, supporting school activities by volunteering in classrooms, providing language-rich environments and working in

partnership with teachers to enhance the learning experiences of children.

When parents are decision makers, they are actually involved in the running of the school through site-based decision making committees. While the evidence regarding the effectiveness of this arrangement is not clear, it is becoming an increasingly popular method of enhancing parent and community involvement in the schools.

SELF-CONFIDENCE

Two main things contribute to self-confidence: self-efficacy and self-esteem. We gain a sense of self-efficacy when we see ourselves (and others similar to ourselves) mastering skills and achieving goals that matter in those skill areas. This is the confidence that, if we learn and work hard in a particular area, we'll succeed; and it's this type of confidence that leads people to accept difficult challenges, and persist in the face of setbacks.

Some people believe that self-confidence can be built with affirmations and positive thinking. At Mind Tools, we believe that there's some truth in this, but that it's just as important to build self-confidence by setting and achieving goals thereby building competence. Without this underlying

competence, you don't have self-confidence; you have shallow over-confidence, with all of the issues, upset and failure that this brings.

NEED FOR THE STUDY

Students with parents who are involved in their school tend to have fewer behavioral problems and better academic performance, and are more likely to complete secondary school than students whose parents are not involved in their school. Positive effects of parental involvement have been demonstrated at both the elementary and secondary levels across several studies, with the largest effects often occurring at the elementary level.

A recent meta-analysis showed that parental involvement in school life was more strongly associated with high academic performance for middle school than helping with homework. Involvement allows parents to monitor school and classroom activities, and to coordinate their efforts with teachers to encourage acceptable classroom behavior and ensure that the child completes schoolwork. Teachers of students with highly involved parents tend to give greater attention to those students, and they are more likely to identify at earlier stages problems that might inhibit student learning. Parental involvements in school, and positive parent-teacher

interactions, have also been found to positively affect teachers' Self-confidence.

METHODS OF THE STUDY

The survey method has been used for the present study to find out the significant relationship between Parental Involvement and self confidence of prospective teachers stratified random sampling technique has been adapted for the present study for the selection of samples from the colleges of education. The sample of the study includes the student teachers studying in colleges of education in Trichy district, 300 samples selected for this study. Self confidence inventory prepared by **Anderson** (1988) and Parental involvement questionnaire prepared by **Hoover-Dempsey and Sandler's** (1995, 1997) have been used to find out the relationship between Parental Involvement and self confidence among student teachers.

ANALYSIS OF DATA AND INTERPRATATION

Null Hypothesis

1. There is no significant difference between the student teachers with respect to Self Confidence based on their Gender.

Table-1

TABLE SHOWS THE SIGNIFICANT DIFFERENCE BETWEEN THE STUDENT TEACHERS WITH RESPECT TO SELF CONFIDENCE BASED ON THEIR GENDER USING MEAN SCORES.

VARIABLE	GENDER	N	MEAN	SD	t - value	L.S
Self Confidence	Male	150	84.61	26.161	5.418	0.01
	Female	150	71.53	13.781		

INFERENCE

From the above table, it is inferred that t-value (5.418) is greater than the table value (2.58) at 0.01 level. Hence there is a significance difference between the Male and Female Student Teachers on their Self

Confidence mean scores. Therefore the above null hypothesis is rejected.

2. There is no significant difference between the Student Teachers with respect to Parental Involvement based on Gender.

TABLE -2

TABLE SHOWS THE SIGNIFICANT DIFFERENCE BETWEEN THE STUDENT TEACHERS WITH RESPECT TO PARENTAL INVOLVEMENT BASED ON GENDER USING MEAN SCORES.

VARIABLE	GENDER	N	MEAN	SD	t - value	L.S
Parental Involvement	Male	150	70.37	41.159	0.618	NS
	Female	150	73.31	41.463		

INFERENCE

From the above table, it is inferred that t-value (0.618) is lesser than the table value (1.96) at 0.05 level. Hence there is no significance difference between the Male and Female Student Teachers on their

Parental Involvement mean scores. Therefore the above null hypothesis is rejected.

3. There is no significant difference between the Student Teachers with respect to Self Confidence based on Location.

TABLE -3

TABLE SHOWS THE SIGNIFICANT DIFFERENCE BETWEEN THE STUDENT TEACHERS WITH RESPECT TO SELF CONFIDENCE BASED ON LOCATION USING MEAN SCORES.

VARIABLE	LOCATION	N	MEAN	SD	t - value	L.S
Self Confidence	Rural	190	76.90	21.400	1.215	NS
	Urban	110	80.08	22.635		

INFERENCE

From the above table, it is inferred that t-value (1.215) is lesser than the table value (1.96) at 0.05 level. Hence there is no significance difference between the rural and urban area Student Teachers on their

Self Confidence mean scores. Therefore the above null hypothesis is accepted.

4. There is no significant difference between the Student Teachers with respect to Self Confidence based on Family monthly income.

TABLE -4

TABLE SHOWS THE SIGNIFICANT DIFFERENCE BETWEEN THE STUDENT TEACHERS WITH RESPECT TO SELF CONFIDENCE BASED ON FAMILY MONTHLY INCOME BASED ON THEIR MEAN SCORES.

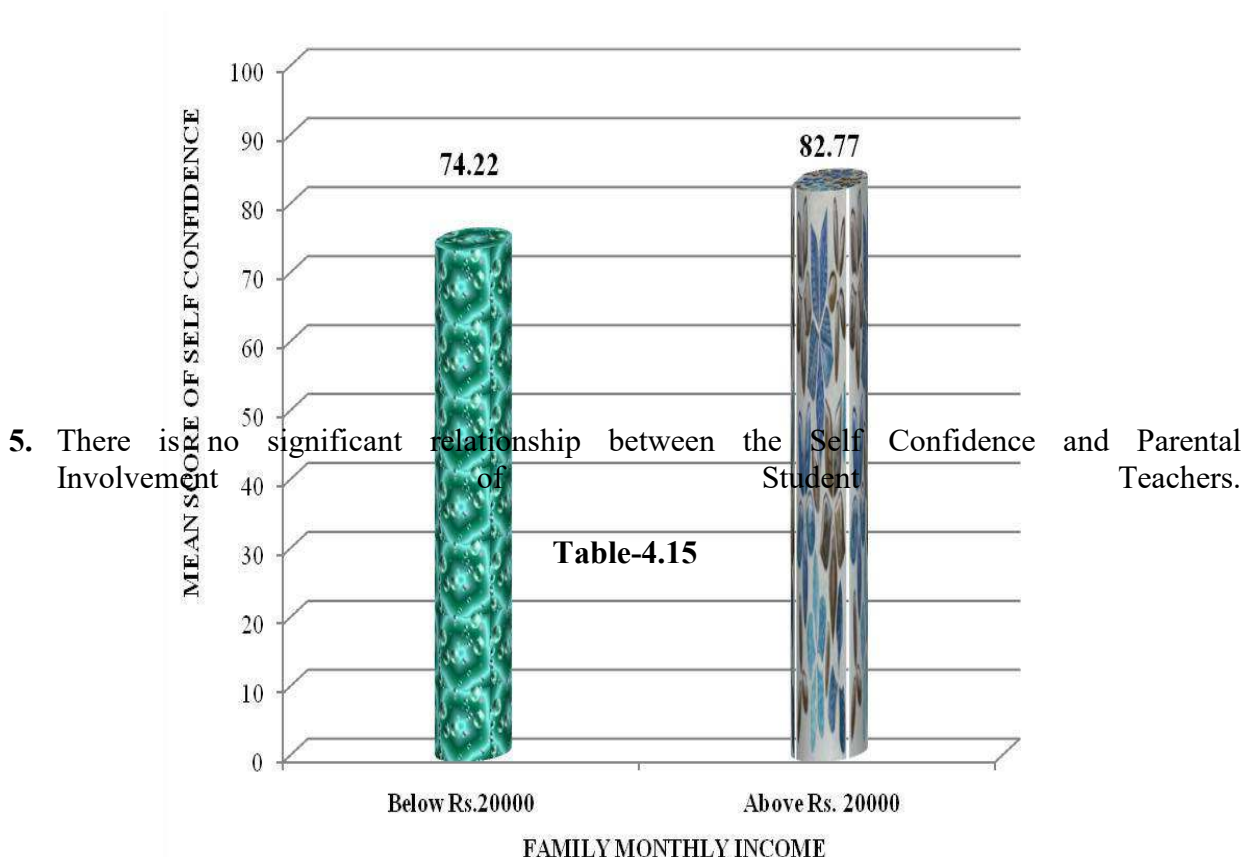
VARIABLE	FAMILY MONTHLY INCOME	N	MEAN	SD	t - value	L.S
Self Confidence	Below Rs.20000	165	74.22	21.698	3.429	0.01
	Above Rs.20000	135	82.77	21.242		

INFERENCE

From the above table, it is inferred that t-value (3.429) is greater than the table value (2.58) at 0.01 level. Hence there is a significance difference between the Below

Rs.20000 and Above Rs.20000 family monthly income of Student Teachers on their Self Confidence mean scores. Therefore the above hypothesis is rejected.

GRAPH SHOWS THE SIGNIFICANT DIFFERENCE BETWEEN THE STUDENT TEACHER WITH RESPECT TO SELF CONFIDENCE BASED ON FAMILY MONTHLY INCOME BASED ON THEIR MEAN SCORES.



5. There is no significant relationship between the Self Confidence and Parental Involvement of Student Teachers.

TABLE SHOWING THE RELATIONSHIP BETWEEN THE SELF CONFIDENCE AND PARENTAL INVOLVEMENT OF PROSPECTIVE TEACHERS.

Variable	Number	Correlation
Self Confidence Vs Parental Involvement	300	0.731

INTERPRETATION

From the above table, it is observed that there is a positive relationship between Parental Involvement and Self Confidence of Student Teachers. Therefore the null hypothesis is rejected. There exists a positive correlation relationship among these two groups.

CONCLUSION

What parents do with their children at home through the age range, is much more significant than any other factor open to

educational influence. Notwithstanding the poor quality of research and evaluations in intervention studies a clear picture of need, want, commitment and readiness is evident. What seems to be lacking is an effort to put these two bodies of knowledge together in a development format likely to deliver the achievement bonus from enhanced parenting. It is true that self confidence can be gained through ourselves, but sometimes we need some intensive guidance from successful people. We can learn from

them, treat them as our mentor, and emulate their success and confidence. This is essential because whenever we are facing any difficulties, we will continue to be

inspired and motivated by these successful persons. Hence, this will eventually greatly improve your self confidence.

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OPTIMIZATION OF SMALL SIZED FILE ACCESS EFFICIENCY IN HADOOP DISTRIBUTED FILE SYSTEM BY INTEGRATING VIRTUAL FILE SYSTEM AND BUCKET CHAINING TECHNIQUE USING ENSEMBLE CLASSIFIERS

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ABSTRACT:

Nowadays storing and processing of large number of small sized files in HDFS is a major problem. In order to give the improved access in terms of time for small sized files we have proposed this solution. A novel approach called VFS-HDFS architecture is designed in which we have focused on optimization of small sized files with significant development compared with the existing solutions i.e. HDFS sequence files, HAR, NHAR. Virtual file system has been integrated in the existing HDFS architecture. In this paper drawbacks of existing techniques i.e. Flat File Technique and Table Chain Technique which are implemented in HDFS HAR, NHAR, sequence file is overcome by using Bucket Chain Technique. The files to merge in a single bucket are selected using ensemble classifier which is a combination of different classifiers. Combination of multiple classifiers gives the better accurate results. Using this proposed system the better results are obtained compared with the existing system in terms of access efficiency of small sized files in HDFS.

Keywords: HDFS, Small Sized Files, Virtual File System, Bucket Chain, Ensemble Classifiers, Text Classification.

Introduction

Due to the outbreak of a COVID-19 pandemic, the entire world is now working in online mode. As a result, a massive volume of data has been generated, making it extremely complex to store, analyse and handle. The term big data generally used for this. The generated large volume of data which is in the form of structured or unstructured format. There is an immense need of analyzing and classifying this data in terms of size. HDFS gives the solution for this, which is responsible for handling large files in GBs or TBs in size of unlimited storage. HDFS works closely with the small number of large files. It is inefficient for handling large number of small files. Large number of small sized files consumes more memory on the namenode of the HDFS. Access mechanism of small sized files concept is a major problem in HDFS [13].

I. Existing Approach HAR (Hadoop Archives)

HAR files were created to reduce the problem among several files putting a pressure on the memory of name nodes. On the HDFS, a layered system has been installed. The

Hadoop archive command is used to create HAR files. It is not more efficient to read through files in a HAR than it is to read across files in Hadoop. Each HAR file access needs the reading of two index files in addition to the data file, which slows down the process [2][9][25]. The flat table technique is used to implement the HAR.

New HAR (NHAR)

For name nodes, processing a large number of small files takes more time. In fact, the amount of time it takes to access such data should be minimized. NHAR [2][9][16] is a novel solution that relies on Apache Hadoop's HAR. The table chain technique is used to implement NHAR.

Spatiotemporal Small File Merging Strategy

In previous work, Lion Xiong et al. [1][2] employed a small file usage pattern to identify candidate files for merging into a single container. They employed file access time stamps to analyze usage patterns, then grouped files with sequential time stamps and generated support files for each file group. A single container is used to store a file group with a high support value.

II. Proposed Approach

In this paper, the proposed technique is implemented by creating a library which abstracts implementation of Hadoop libraries.

Bucket Chain Technique

Using large no. of small files with different sizes and we have analyzed the experimental results. Ultimately the time required for accessing files in HDFS is improved.

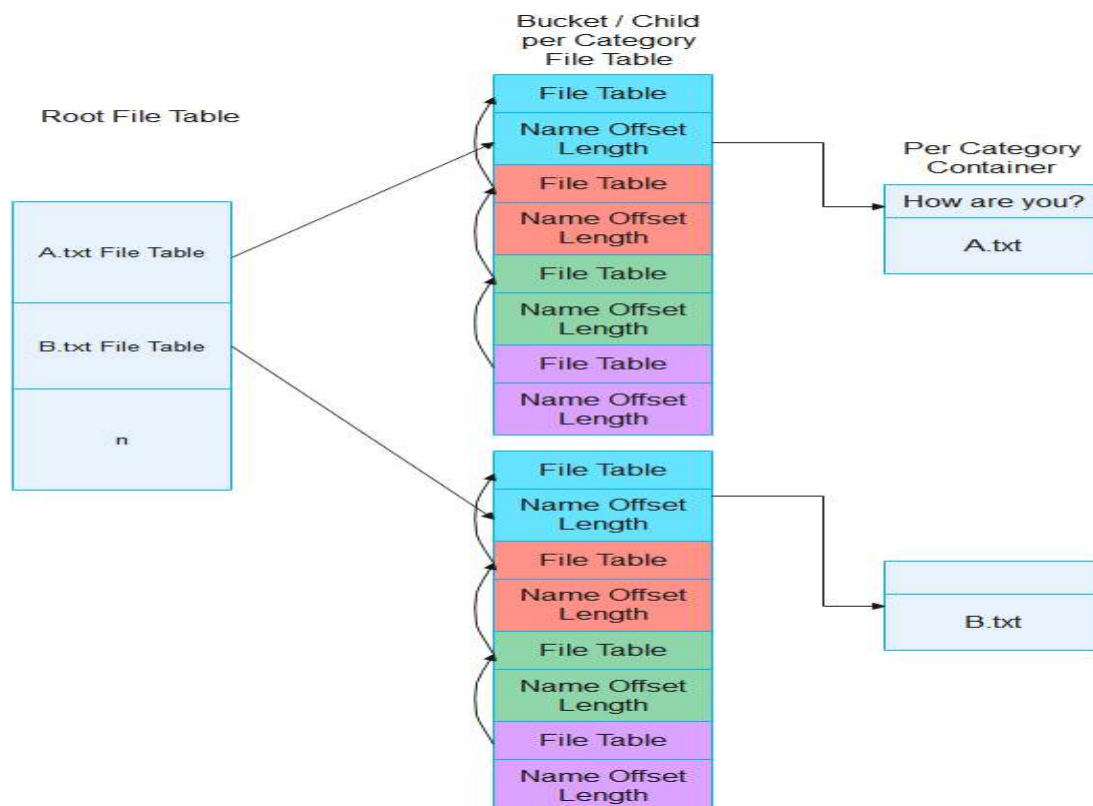


Figure 1 Bucket Chain Technique

Methodology

In this method all file’s metadata is stored in a single file, this file is called File Table. This file contains linked list of tables, forming a table chain. Another file is used to store actual contents of files, this file is called Container File. One container files is used for each category. All these files are stored on HDFS. File table contains metadata of a file such as filename, offset, and length.

Before storing every file, it is classified using ensemble classifier to get its category. That file is then stored in container of that category and corresponding file table is also updated. On startup the file table for each category is loaded in memory. First the latest file table is located in file table and its contents are added to in-memory file table, then previous file table is located and the process continued until first file

table is reached. While doing this a file’s metadata is already found in in-memory file table then that entry is discarded (as it has become old due to updating or deletion of file).

In every run, a new in-memory file table for each category is created to track new or updated files in that category. At runtime all metadata create and update operations are performed on this in-memory file table. Actual contents of the files are appended in container file. On shutdown, the contents of in-memory file table are appended to file table in HDFS. This creates a chain of buckets, each bucket stores list of file tables which makes it possible to update and delete files.

For reclaiming space used by deleted or updated files, the technique of pruning used. In this technique new copies of file tables are create while skipping the

deleted or updated entries. This will reduce space required for file tables and containers. Caching is used to reduce time required for reading files in already retrieved blocks. Each cache entry stores

tuple of category, file, position, length and its complete block content. This will reduce time at the cost of increased memory requirement.

Algorithm: Bucket Chain

```
globals:
    filenameetable
    indexfilemap
    containerfilemap
    filetablemap
    newfiletablemap
    classification_model
    categorylist
function initialize()
    filenameemap=load_filenameemap()
    for cat ∈ categorylist
        indexfile=indexfilemap[cat]
        containerfile=containerfilemap[cat]
        filetable=filetablemap[cat]
    file_index_location=get_last_index(indexfile)
    while file_index_location != NULL
        indices=read_index(file_index_location)
        filetable = filetable ∪ (indices - (filetable ∩ indices))
        file_index_location=get_prev_index(file_index_location)
function add_file(filename, content)
    cat = classify(classification_model, content)
    location=append_content(containerfilemap[cat], content)
    add_file_entry(newfiletablemap[cat], filename, location, len(content))
    add_filenameetable(filenameetable, filename, cat)
function get_file(filename)
    cat = get_category(filenameetable, filename)
    location, length = find_file(newfiletablemap[cat], filetable[cat], filename)
    data = read_content(containerfilemap[cat], location, length)
    return data
function close()
    for cat ∈ categorylist
        last_index=get_last_index(indexfilemap[cat])
        append_entry_table(indexfilemap[cat], newfiletable[cat])
        append_prev_index(last_index)
    update_filenameetable(filenameetable)
```

Advantages of Bucket Chain Technique:

1. It has separate category wise containers.
2. It contains cache memory.
3. Pruning is applied to remove unused files in containers to reduce the memory wastage.
4. Optimal File Table Size.
5. Access time efficiency improved.

Text Classification

It is used to classify the text documents automatically into one or multiple defined categories. Category of news article from Reuters-21578 Text Categorization dataset [24] is taken into consideration for text classification. Text Categorization is an example of supervised machine learning task. A labelled dataset containing text

items and associated labels is used to train a classifier. Text classification consists of three main components [30].

1. Dataset Preparation
2. Feature Engineering
3. Model Training
4. Improve Performance of text classifier

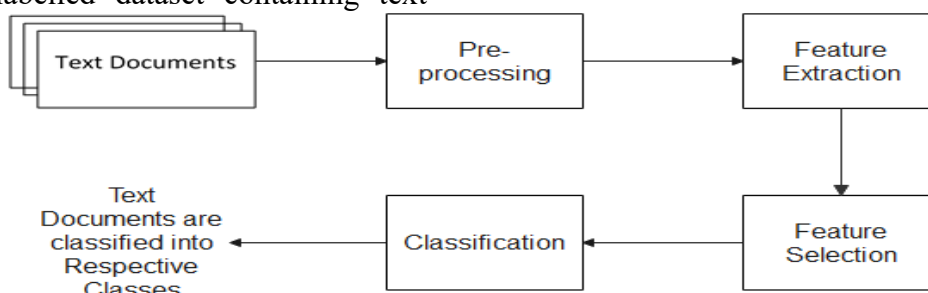


Figure 2: Text Classification Task

Description of Dataset:

Table 1: Experimental Setup

Name of Dataset	Data Types	Default Task	Attribute Type	No. of Instances	No. of Classes	Year
Reuters-21578 Text Categorization Collection	Text	Classification	Categorical	1000	70	1997

Experimentation is done on the Reut2-000.sgm & Reut2-002.sgm files.

TF-IDF:

The technique stands for Term Frequency-Inverse Document Frequency which is used to quantify words from documents; a weight has been assigned to each word which states that the significance of each word in the document and its collection [28][29].

TF-IDF score signifies the relative importance of a keyword or a term in the document and the entire corpus. The score consists of two terms: the first term computes the normalized Term Frequency (TF) and the second term is the Inverse Document Frequency (IDF), calculated as the logarithm of the number of the documents in the corpus divided by the number of documents where the definite term appears[28][29].

Formula: $idf(t) = \log(N/df)$

The tf-idf metric is calculated by considering the total number of documents, dividing it by

the number of documents that which contain a word and calculating the logarithm [25][26].

$$tfidf(t) = tf(t) * idf(t)$$

Classifiers Used for Experimentation:

1. Naive Bayes Classifiers

The Bayes theorem is used to create a Naïve Bayes classifier. It calculates membership probabilities for every class, such as the likelihood that a certain record or data point belongs to that class. The most likely class is defined as the one having the highest probability. It is capable of dealing with both discrete and continuous data. It can handle a large number of predictions and data sets [32].

2. Random Forest

It is a machine learning technique which is used to solve regression and classification problems. It makes use of ensemble learning, which is a technique to

solve difficult problems by combining multiple classifiers. Many decision trees to make up a random forest algorithm. The random forest algorithm's produced 'forest' is trained via bagging or bootstrap aggregation. The (random forest) algorithm determines the outcome based on decision tree predictions. It estimates by averaging the output of various trees [31].

3. J48 Classifiers

The J48 algorithm is one of the best machine learning algorithms for categorizing and continuously evaluating data. J48 can assist in not only making correct predictions from data, but also in explaining its patterns. It addresses issues such as numeric attributes, missing values, and pruning, predicting error

rates, decision tree induction complexity, and creating rules from trees [3].

4. Ensemble Classifiers

For classification purpose we have used ensemble learning method. These ensembles combine multiple hypotheses to form a better hypothesis. Ensemble learning supports to improve machine learning results as compared to a single model by combining several models. Basic idea is to learn a set of classifiers and to allow them for vote. Combination of Random Forest, Naïve Bayes and J48 classifiers are used for experimentation [33].

Advantages: Motivation behind to use ensemble classifier is to improve the predictive accuracy.

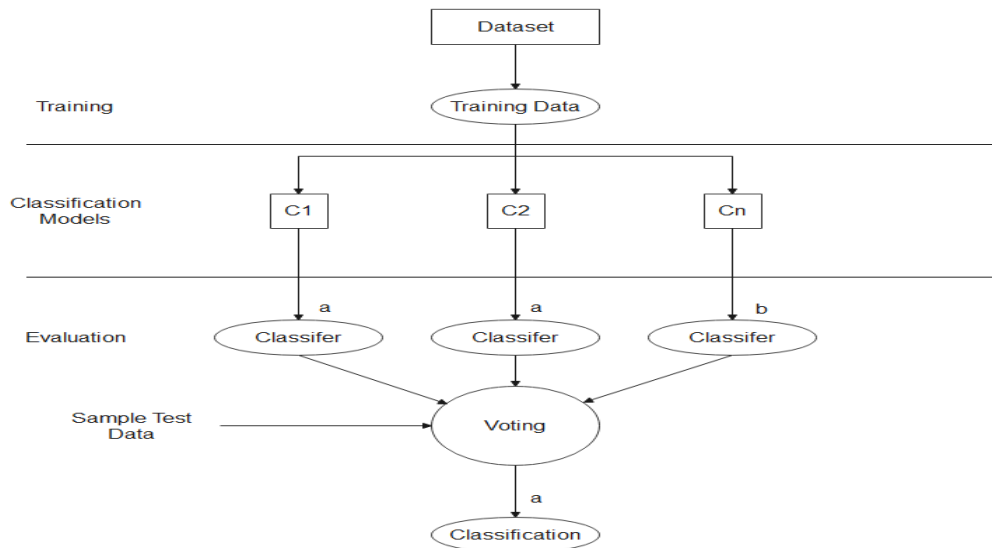


Figure 3: Architecture of Ensemble Classifier

Experimental Setup:

The proposed system is implemented on top of existing HDFS architecture. The proposed algorithm is experimented on Fedora 32.0 Operating System, Hadoop 3.2.0 and Java 1.8.0 Version. It contains 16 GB of RAM and 500 GB of Hard Disk

with i5-5500U CPU @ 2.20GHz processor. Reuters-21578 Text Categorization Collection dataset is used to test the proposed system.

Following Experimental set up is used to execute the proposed work.

Table 2: Experimental Setup

Sr. No.	Parameters	Description
1	No. of Nodes	Single Node (Acts as both Master & Slave)
2	Node Configuration	Intel(R) Core(TM) i5-5500U CPU @ 2.20GHz
3	RAM	16 GB
4	Hard Disk	500GB
5	Operating System	Fedora 32.0

6	Execution Platform	JDK 1.8.0
7	Hadoop Version	3.2.0
8	Development Tool	Net Beans 12.0
9	Dataset	Reuters containing TEXT files
10	Number of Files considered	2138
11	File Size Range	Average From 1 KB to 100 KB
12	No. of Iterations	1000
13	No. of Classes	70

Table 3: Memory & Time Requirement for Bucket Chain Algorithm

Memory & Time Requirement for Bucket Chain Algorithm 1000 Iterations		
Average File Size	Memory (in MB)	Time (in Seconds)
1K	30.7	39
5K	31	39
10K	35.2	41
50K	40.5	46
100K	55.2	55

Table 3 shows how much memory and time required to access small sized files in bucket chain algorithm.

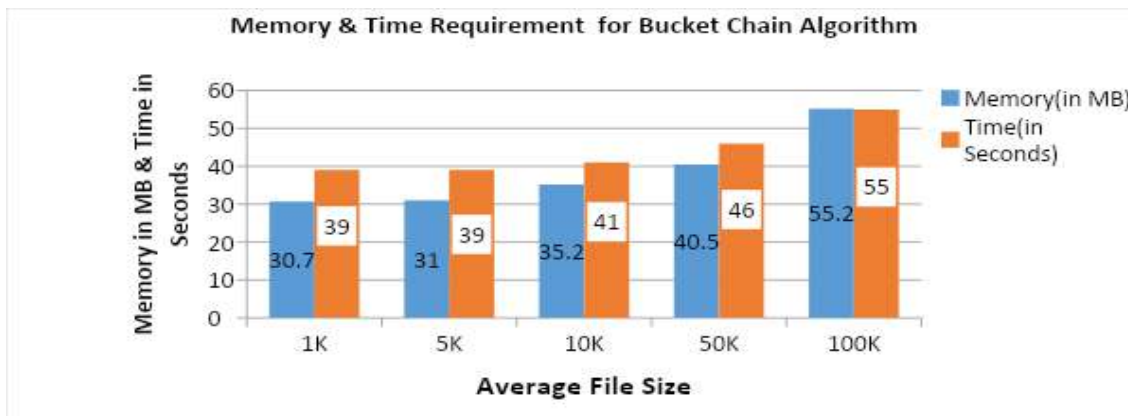


Figure 4 Performance with respect to Time and Memory for Bucket Chain Algorithm

Figure 4 indicates the performance of the proposed technique in terms of time and memory.

Table 4: Comparative Chart for Memory Requirement for Flat, Table and Bucket Chain Algorithm.

Memory Requirement for 1000 Iterations				
Average File Size	Flat Table Algorithm (in MB)	Table Chain Algorithm (in MB)	Bucket Chain Algorithm (in MB)	
1K	16.2	19	30.7	
5K	16.5	19.1	31	
10K	17.1	21.2	35.2	
50K	19.3	23.1	40.5	
100K	27.4	35.8	55.2	

Table 4 shows the comparative chart of Experimental results of existing technique (Flat Table Algorithm & Table Chain Algorithm) and proposed technique-

Bucket chain algorithm. where the memory requirement is increased due to the cache.

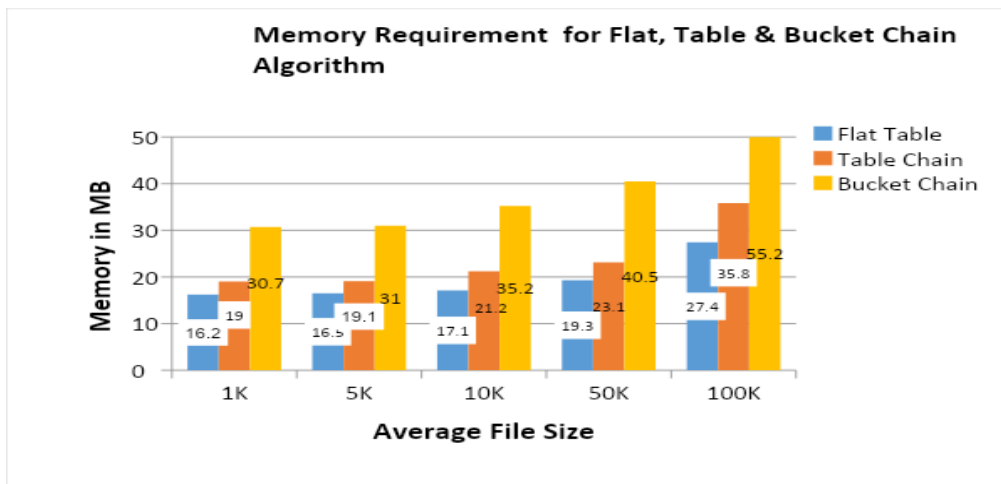


Figure 5 Memory Requirement for Flat, Table & Bucket Chain Algorithm.

Figure 5 shows the comparative chart of Algorithm) and proposed technique- Bucket chain algorithm. Experimental results of existing technique (Flat Table Algorithm & Table Chain

Table 5 Comparative Chart for Time Requirement for Flat, Table and Bucket Chain Algorithm.

Time Requirement for 1000 Iterations				
Average File Size	Flat Table Algorithm (in Seconds)	Table Chain Algorithm (in Seconds)	Bucket Chain Algorithm (in Seconds)	
1K	56	45	39	
5K	58	45	39	
10K	64	48	41	
50K	71	57	46	
100K	97	70	55	

Table 5 shows the comparative chart of Algorithm) and proposed technique- Bucket chain algorithm. Where small files access time efficiency is increased. Experimental results of existing technique (Flat Table Algorithm & Table Chain

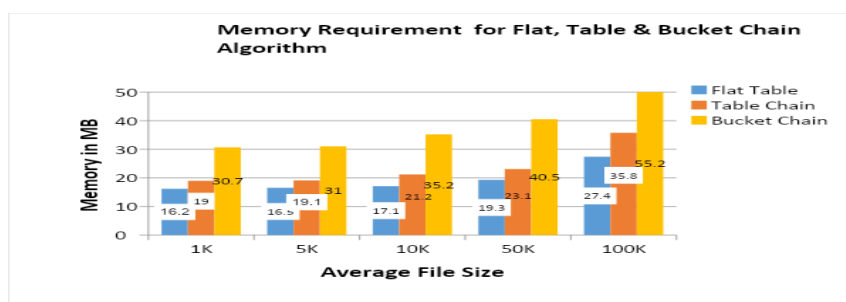


Figure 6 Memory Requirement for Flat, Table & Bucket Chain Algorithm.

Figure 5 shows the comparative chart of Algorithm) and proposed technique- Bucket chain algorithm. Experimental results of existing technique (Flat Table Algorithm & Table Chain

Table 6 Comparative Chart for Time Requirement for Flat, Table and Bucket Chain Algorithm.

Time Requirement for 1000 Iterations				
Average	File Size	Flat Table Algorithm (in Seconds)	Table Chain Algorithm (in Seconds)	Bucket Chain Algorithm (in Seconds)
	1K	56	45	39
	5K	58	45	39
	10K	64	48	41
	50K	71	57	46
	100K	97	70	55

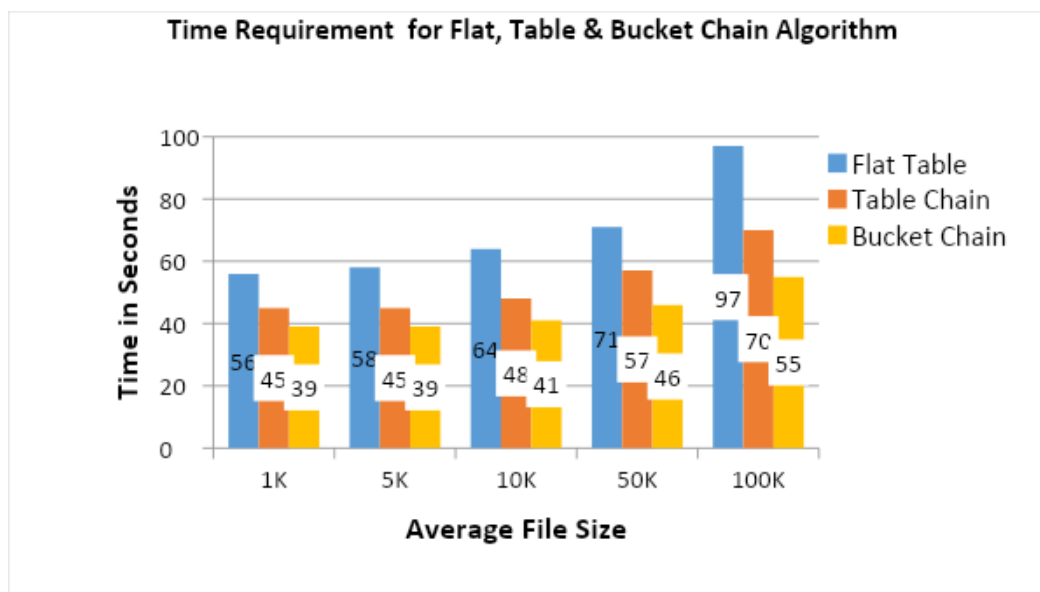


Figure 7 Time Requirement for Flat, Table & Bucket Chain Algorithm.

Results and Analysis

In this paper, the proposed technique is implemented by applying the changes in hadoop source code & libraries. Using large no. of small files with different sizes

we have analyzed the experimental results. Ultimately the performance with name node and datanode for the developed technique is improved.

Classifier Metrics:

Table 7 Different classifier metrics along with ensembles.

Parameters	Naïve Bayes	J48	Random Forest	Ensemble (Naïve Bayes+J48+Random Forest)
Total Instances	962	962	962	962
Correctly Classifies Instances	684	738	899	922
Incorrectly Classified Instances	278	224	63	40
Accuracy	71%	77%	93%	96%

Confusion Matrix for a single class:

Confusion matrix is created for class “earn” from reut2-002.sgm file

Table 8 Confusion Matrix

Total Instances N=962	Actually Positive	Actually Negative
Predicted Positive	131	40
Predicted Negative	0	791

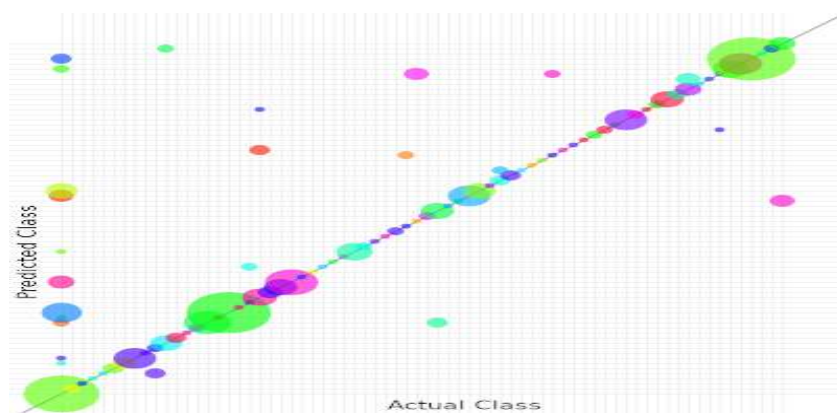
**Figure 8 Accuracy of Classification and Predictions**

Figure 8 shows the bubble chart of accuracy of classification and predictions of total 70 classes. X-axis indicates the actual class. Y-axis indicates the predicted class. Instances on 45 degree line are correctly classified instances. Incorrectly identified instances are randomly shown in random positions. Size of bubble indicates number of instances in that position.

Conclusion & Future Work:

In this work we have proposed a novel approach called *VFS-HDFS* architecture in which we have optimized the access efficiency of small sized files in HDFS with a significant improvements compared with the existing techniques i.e. flat table and table chain technique. A new

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algorithm is proposed called bucket chain algorithm and the entire work is executed using this algorithm where memory requirement is increased to store the files in cache and time required to access the files from the cache is reduced. The proposed work uses the ensemble classifiers to classify the training data sets. Comparison is made between the experimental results of existing approach-i.e. flat table and table chain techniques and the proposed technique-bucket chain technique. In the proposed system it is observed that time required to access the files is reduced and memory required to store the files is increased.

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DROPOUT AND THEIR SOCIO-ECONOMIC CORRELATES: A STUDY OF COLLEGE DROPOUTS IN KHELARI AND BURMU BLOCK OF RANCHI DISTRICT, JHARKHAND

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ABSTRACT

Khelari and Burmu are two of the 18 Community Development Blocks that constitute Ranchi district. These blocks lack in infrastructural development and economy is mainly dependent on coal mines, cement factories, kilns and plantation. The area also lacks in educational infrastructure. Though there are many good high schools, yet the area is wanting in realm of higher education. Students from Khelari and Burmu are dependent upon UKSM College, Dakra to fulfill their aspirations for higher education, while the more fortunate and affluent ones migrate to Ranchi or Mandar.

Data from UKSM College, Dakra brought forth high dropout rates, especially among the marginalized communities of Khelari and Burmu. On further unearthing, through interviews from dropout students, varied reasons for dropout came forth viz. poverty, alcoholism, lack of motivation for higher education and occupational compulsions which hindered their pursuit for higher education.

KEY WORDS: Status of Education, Dropout in Higher Education, Higher Education in Jharkhand, ST-SC in Education, Problems in higher Education, Wastage in Education, Higher Education in Khelari.

INTRODUCTION:

At present, the district of Ranchi consists of 2 subdivisions viz., Ranchi & Bundu and 18 Community Development Blocks. The CD Blocks of Burmu, Mandar, Chanho, Bero, Lapung, Ratu, Namkum, Kanke, Ormanjhi, Angara, Khelari, Nagri, Itki and Silli come under Ranchi Sub-Division, while the CD Blocks of Rahe, Sonahatu, Tamar-I and Bundu come under Bundu Sub-Division.

Khelari and Burmu are two of the 18 Community Development Blocks that constitute Ranchi district. These blocks lack in infrastructural development and economy is mainly dependent on coal mines, cement factories, kilns and plantation. The area also lacks in educational infrastructure. Though there are many good high schools, yet the area is wanting in realm of higher education. Students from Khelari and Burmu are dependent upon UKSM College, Dakra to fulfill their aspirations for higher education, while the more fortunate and affluent ones go to Ranchi or Mandar.

Data from UKSM College, Dakra brought forth the high dropout rates, especially among the marginalized communities of Khelari and Burmu. On further unearthing, through

interviews from dropout students, varied reasons for dropout came forth viz. poverty, alcoholism, lack of motivation for higher education and occupational compulsions which hindered their pursuit for higher education.

STUDY AND FINDINGS

Drop-out data from the college was collected for B.A. and B.Com. for the sessions 2012-15 and 2013-16. For this, the total number of students registered in B.A. (Part 1) and B. Com (Part 1) for the year 2012 and 2013 was tabulated category wise. The total number of students who appeared for their Part 3 exams at the end of their session, i.e., in 2015 and 2016 respectively, was also tabulated category wise. From the above two figures, i.e., total number of students registered in Part 1 and total number of students who appeared in their Part 3 exams for their respective streams, we arrived at the probable dropout figure for each category.

DROPOUT DATA from UTTARI KARNPURA SHARMIK

MAHAVIDYALAYA,

DAKRA Uttari Karnpura Sharmik Mahavidyalaya (UKSM College) Dakra, is a private aided college founded in the year 1990 to cater the

educational aspirations of workers' children living in Burmu, Khalari and surrounding region. It is affiliated to Ranchi University, Ranchi. The college offers undergraduate

(Honours) courses in Economics, English, Geography, Hindi, History, Political Science, Sociology, Mathematics (Arts) and Accounts.

B.A. Dropout data for session 2012-15: UttariKarnpuraSharmikMahavidyalaya, Dakra

		B.A.: 2012-15					
A	B	C	D	E	F	G	H
Category	Sex	Total Regn in Part 1 (2012)	Appeared in Final Year (2015)	Perct Appeared	Probable Dropout	Dropout Perct	Cat Dropout
Legend -->		2012 R (P1)	2015 A (P3)		DO 2012-15		
BC1	F	4	3	75.00	1	25.00	20.00
BC1	M	1	1	100.00	0	0.00	
BC2	F	48	32	66.67	16	33.33	47.30
BC2	M	26	7	26.92	19	73.08	
GEN	F	37	21	56.76	16	43.24	40.82
GEN	M	12	8	66.67	4	33.33	
SC	F	12	3	25.00	9	75.00	72.22
SC	M	6	2	33.33	4	66.67	
ST	F	14	3	21.43	11	78.57	76.19
ST	M	7	2	28.57	5	71.43	
Total		167	82	49.10	85	50.90	

Table (a)

Legends used:

- a) BC1 = Backward Class (Annexure 1)
- b) BC2 = Backward Class (Annexure 2)
- c) Gen = General Category
- d) SC = Scheduled Caste
- e) ST = Scheduled Tribe
- f) M = Male
- g) F = Female
- h) 2012 R (P1) = Number of students who registered in Part 1 in the year 2012
- i) 2015 A (P3) = Number of students who appeared in Part 3 exam in the year 2015
- j) B.A. = Bachelor of Arts
- k) DO 2012-15 = Probable dropout for the session 2012-15

B.A. Dropout data for session 2013-16: UttariKarnpuraSharmikMahavidyalaya ,Dakra

		B.A.: 2013-16					
A	B	C	D	E	F	G	H
Category	Sex	Total Regn in Part 1 (2013)	Appeared in Final Year (2015)	Perct Appeared	Probable Dropout	Dropout Perct	Cat Dropout

Legend -->		2013 R (P1)	2016 A (P3)		DO 2013-16		
BC1	F	8	8	100.00	0	0.00	47.37
BC1	M	11	2	18.18	9	81.82	
BC2	F	56	41	73.21	15	26.79	37.63
BC2	M	37	17	45.95	20	54.05	
GEN	F	41	17	41.46	24	58.54	51.43
GEN	M	29	17	58.62	12	41.38	
SC	F	15	6	40.00	9	60.00	53.85
SC	M	11	6	54.55	5	45.45	
ST	F	26	10	38.46	16	61.54	63.27
ST	M	23	8	34.78	15	65.22	
Total		257	132	51.36	125	48.64	

Table (b)

B.Com. Dropout data for session 2012-15: UttariKarnpuraSharmikMahavidyalaya ,Dakra

		B.Com.: 2012-15						
A	B	C	D	E	F	G	H	
Category	Sex	Total Regn in Part 1 (2012)	Appeared in Final Year (2015)	Perct Appeared	Probable Dropout	Dropout Perct	Cat Dropout	
Legend -->		2012 R (P1)	2015 A (P3)		DO 2012-15			
BC1	F	1	1	100.00	0	0.00	50.00	
BC1	M	1	0	0.00	1	100.00		
BC2	F	6	5	83.33	1	16.67	28.57	
BC2	M	8	5	62.50	3	37.50		
GEN	F	6	5	83.33	1	16.67	16.67	
GEN	M	6	5	83.33	1	16.67		
SC	F	3	1	33.33	2	66.67	50.00	
SC	M	1	1	100.00	0	0.00		
ST	F	3	2	66.67	1	33.33	33.33	
ST	M	3	2	66.67	1	33.33		
Total		38	27	71.05	11	28.95		

Table (c)

B.Com. Dropout data for session 2013-16: UttariKarnpuraSharmikMahavidyalaya ,Dakra

		B.Com.: 2013-16					
A	B	C	D	E	F	G	H
Category	Sex	Total Regn in Part 1 (2013)	Appeared in Final Year (2015)	Perct Appeared	Probable Dropout	Dropout Perct	Cat Dropout
Legend -->		2013 R (P1)	2016 A (P3)		DO 2013-16		
BC1	F	1	0	0.00	1	100.00	100.00
BC1	M	1	0	0.00	1	100.00	
BC2	F	14	11	78.57	3	21.43	32.14
BC2	M	14	8	57.14	6	42.86	
GEN	F	15	5	33.33	10	66.67	61.54
GEN	M	11	5	45.45	6	54.55	
SC	F	4	0	0.00	4	100.00	66.67
SC	M	2	2	100.00	0	0.00	
ST	F	4	3	75.00	1	25.00	42.86
ST	M	3	1	33.33	2	66.67	
Total		69	35	50.72	34	49.28	

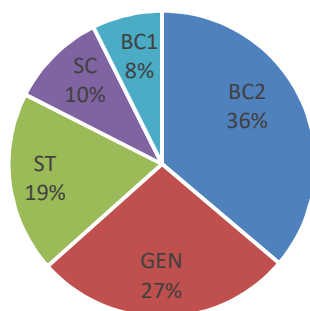
Table (d)

Enrollment in BA and B.Com stream:

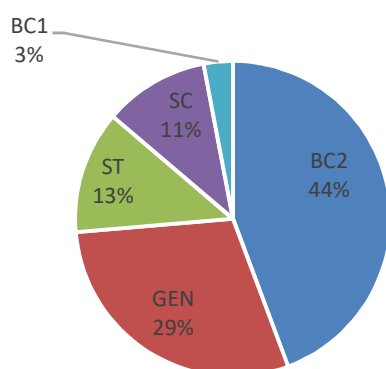
The bulk of enrolments in B.A. stream (both sessions) came from BC-2 category, followed by General category students. The ST category students made 13% of total enrolments in 2012-15 session which increased to 19% in 2013-16 session. The SC students made up 11% of enrolments in 2012-

15 and 10% of enrolments in 2013-16 session. The same trend was found in Commerce stream as well, with bulk of students coming from BC-2 and General category, while ST and SC category students coming at 3rd and 4th place in terms of enrolments. This was in line with the demography of the region.

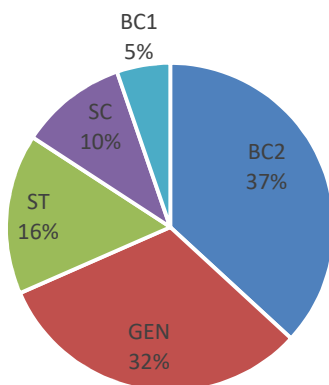
Category wise Enrolment in B.A. 2013-16

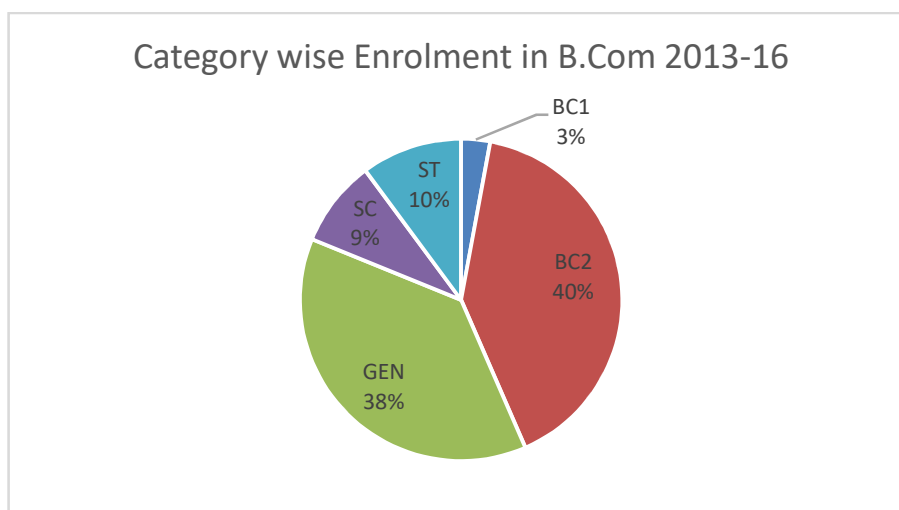


Category wise Enrolment in B.A. 2012-15



Category wise Enrolment in B.Com 2012-15





Dropout in BA and B.Com stream:

The dropout figure in B.A. is alarming. Roughly 50% of the students drop-out of higher education before completing their graduation. The dropout percentage in 2012-15 session was 51% which marginally declined to 49% in 2013-16 session. The highest dropout in 2012-15 session was recorded among Scheduled Tribe students at 76% followed by Scheduled Caste students at 72%. This prompted the researcher to delve into the reasons behind such high dropout rates among the marginalized communities. The reasons and findings have been deliberated later in this paper. The same trend was found in session 2013-16, though dropout rates among ST and SC category students declined by 13 and 18 percentage points, yet dropout from these two communities was highest among all categories.

Dropout data in Commerce stream showed a different trend. The highest dropout in B.Com was found among Scheduled Caste (50%) and BC-1 category students (50%) followed by Scheduled Tribe (33%) students for session 2012-15. For session 2013-16, the highest dropout was registered among BC-1 category students (100%) followed by Scheduled Caste (67%), General category (62%) and Scheduled Tribe (43%) students. The dropout rate among BC-1 students cannot be conclusive for the category, since there was just 1 enrollment in both the sessions. The dropout trend and percentage in Commerce stream was a bit difficult to ascertain and non-conclusive since the number of enrolments were very low in

comparison to B.A. stream, and thus valid conclusions cannot be drawn from a small sample size. Thus, the researcher thought it prudent to explore the reasons for dropout only among the B.A. students.

REASONS FOR DROPOUT IN B.A. STREAM:

A total of 38 dropout students were traced and contacted using snowball sampling technique and reasons for their dropping out of education collected through unstructured interviews, oriented to gauge the reasons for their dropout in an informal setting and to explore various underlying reasons which may be missed by the researcher in a structured interview. Of these 38 respondents 10 (26%) belonged to General category, 8 (21%) were Scheduled Caste, 8 (21%) were Scheduled Tribe and 12 (32%) were Backward Caste students. 12 (32%) students were girls while 26 (68%) students were boys.

Four major reasons were unearthed through the interviews as reasons for dropout. They are:

- i. Occupational compulsion
- ii. Lack of motivation to pursue higher education.
- iii. Loss of peer group and alcoholism.
- iv. Comprehension difficulties.

Since poverty is high in the area, most of the respondents (63%) used to work either as labourers in brick kilns, coal mines or in fields and they faced difficulties pursuing education along with their economic activity.

Their occupational compulsions hindered their pursuit of higher education finally culminating in dropout. It was also observed that most of the respondents' parents were uneducated and consequently the urge and motivation required to go higher in education was lacking among the respondents. Only 21% (8 respondents) had parents who had education up to Std VIII or less. Parents of 2 respondents were matriculates, while none of the respondents had (either) parents who were graduate. None of the respondents were able to comfortably respond to the researcher's questions on benefits that accrue as a result of higher education. It shows their lack of knowledge regarding the benefits of higher education with respect to economic (occupational) gains and social statuses. The respondents were complacent with their present socio-economic statuses and didn't exhibit inclination to improve it through higher education.

Another interesting observation made was role of alcoholism in dropout. 13 (34%) respondents said that they lost their peer group (mostly alcoholics) due to their pursuit of education and as a result had to face mocking and social boycott. This mocking and social boycott forced them to dropout of education.

7 (18%) respondents said that they faced difficulties in comprehending what was being taught in class, which resulted in their loss of confidence and interest in the subject and they ultimately dropped out of education. Gender wise variation was also observed in reasons for dropout. Girls mostly dropped

either due to economic and domestic constraints or lack of motivation to pursue higher education. There was an overlap of the aforementioned reasons as well. 33% girl respondents dropped due to economic and domestic constraints, 42% dropped for lack of motivation to pursue higher education while 25% cited other reasons for dropout.

Conclusion

Dropout is high among students of Khelari and Burmu blocks of Ranchi and occupational compulsions, which is a result of their low economic statuses, is the prime reason for this. 63% of the respondents dropped out of education due to this reason. Moreover, the area is rich in coal mines and many of the respondents said that they lost their land in the survey carried out by Central Mine Planning and Design Institute (CMPDI) and as a compensation they got employment in Central Coalfields Limited (CCL) depending on their educational level. After getting employed, the urge to pursue higher education extinguished and they subsequently dropped out of higher education. In order to arrest this phenomenon of dropout, a holistic approach is required in which the employers (CCL here) also need to be stake holders. If dropout students are counselled on benefits arising out of higher education, in terms of promotions and payments, and they are given adequate avenues and opportunities to pursue higher education, not only the phenomenon of dropout can be addressed, it can also result in raising the quality of human resource of this region.

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RELATIONSHIP BETWEEN EMOTIONAL INTELLIGENCE AND ACADEMIC ACHIEVEMENT IN ENGLISH AMONG UNDERGRADUATE STUDENTS

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ABSTRACT

The present study was performed aiming at surveying emotional intelligence and its relation with academic performance of undergraduate's students. In order to measure emotional intelligence, the instrument Emotional Intelligence questionnaire was selected. Emotional Intelligence Scale (Constructed and Standardized by Sathiyagirirajan, S., (2010)). A sample consisted of two hundred and forty (240) adolescent students, 82 males and 158 females, participated in this research by stratified sampling. Initially they filled the demographic data form and then they rated themselves on Emotional intelligence test. Finally, their academic performance was appraised on the basis of their final exam, results. In order to analyze data, regression analysis, Pearson's correlation and t-test were used. This shows that there is no significant difference between male and female undergraduates' students in the possession of Emotional Intelligence. Undergraduate's student's emotional intelligence is independent of their sex. This shows that there is no significant difference between the undergraduates' students who are in Urban and rural in the possession of Emotional Intelligence. Undergraduate's student's emotional intelligence is independent of their locality. There is a significant difference between male and female of undergraduate's student's in academic achievement in English. Female ($M=80.34$) is better performance than male students ($M=76.32$) in academic achievement in English. There is a significant difference between rural and urban undergraduates' students in achievement in English. Urban ($M=80.20$) students are better than rural ($M=77.63$) students in their performance of academic achievement in English

Key words Emotional Intelligence, Academic Achievement, Undergraduates students

INTRODUCTION

Emotions play a major role in guiding and directing our behaviour and thus shape our personality. It can be understood as an agitated or excited state of one's mind and body. According to Charles G. Morris, "Emotion is a complex affective experience that involves diffuse physiological changes and can be expressed overtly in characteristic behaviour pattern".

INTELLIGENCE

Intelligence must be understood as the mental capacity or mental energy available with an individual at a particular time in a particular situation. This mental capacity helps one in the task of theoretical as well as practical manipulation of things, objects, or events present in his environment in order to

adapt or to face new challenges and problems of life as successfully as possible. One's capacity or the fund of mental energy available with one can be judged only in terms of the quality of one's behaviour or performance.

Thus intelligence is a sort of mental energy in the form of mental or cognitive abilities, available with an individual which enables one to handle one's environment in terms of adaptation to face novel situations as effectively as possible. In other words, we can access a person's intelligence in proportion to one's ability to use one's mental energy, to handle one's problem and thus leading a happy and well-contented life.

MEANING OF EMOTIONAL INTELLIGENCE

Mayer and Salovey, who coined the term Emotional Intelligence, defined it as:

A learned ability to monitor one's own and other's feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions (1997). Reuvan Baron, a pioneer in the field of Emotional Intelligence, defined it as: An array of non-cognitive capabilities, competencies and skills that influence one's ability to succeed in coping with environmental demands and pressures. Emotional Intelligence is also the ability to recognize, understand and manage emotions in ourselves and others. Emotional Intelligence, then, is the ability to use our emotions to help solve our problems and live a more effective life. We can say that Emotional Intelligence is: Knowing what feels good, what feels bad, and how to get from bad to good.

EVOLUTION OF EMOTIONAL INTELLIGENCE

Back in 1920, the American psychologist Edward Thorndike talked about something he called 'social intelligence'. Later, the importance of 'emotional factors' was recognized by David Wechsler, one of the fathers of IQ testing. In 1940, in a rarely cited paper, Wechsler urged that the 'non-intellective aspects of 'human intelligence' be included in any 'complete' measurement. This paper also discussed what he called 'effective abilities, basically Emotional Intelligence, which he thought would prove critical to an overall view. Unfortunately, this was not included in Wechsler's IQ tests and little attention was paid to it at the time.

Then, in 1948, another American researcher, R.W. Leeper, promoted the idea of 'emotional thought'. But few psychologists or educators pursued this line of questioning until more than 30 years later. In 1983 Howard Gardner at Harvard University wrote about the possibility of 'multiple intelligence' including interpersonal and intrapersonal intelligence. He defined 'interpersonal intelligence' as the 'ability to understand people, what motivates them, how they work, and how to work cooperatively

with them'; 'interpersonal intelligence' involved 'access to one's feelings' and 'the capacity to understand oneself and to use that understanding to operate effectively in their life'.

NEED AND SIGNIFICANCE OF THE STUDY

Education is a character-building process enhancing one's personality and making one rational, capable, responsive and intelligently independent. It generates the will to refashion one's heart, head and life. Till 90's intelligence quotient was the measure of success and intelligence of an individual. Greater the intelligence quotient, the more intelligent the individual was and more successful one was considered to be. Being aware of one's emotional intelligence in terms of an emotional quotient has wide educational and social implication for the welfare of the individual and society.

Mere intelligence quotient cannot predict success in life. In working situations, emotional intelligence helps more than one's intellectual potential in terms of one's intelligence quotient or even professional skills and competencies. A professionally competent person having poor emotional intelligence may suffer on account of his inability to deal with his self or getting along properly with others. A person's emotional intelligence helps much in all spheres of life through its various constituents or components namely knowledge of one's emotions (self-awareness, managing the emotions, motivating oneself, recognizing emotions in others (empathy) and handling relationships. The achievement of the results in terms of better handling of mutual relationships is quite essential and significant in one's life. It is possible through one's potential for emotional intelligence and its proper development. Thus emotional intelligence essentially reflects our ability to deal successfully with other people and with our feelings.

STATEMENT OF THE PROBLEM

The investigator has thought of the conduct of the present study and which is entitled "RELATIONSHIP BETWEEN EMOTIONAL INTELLIGENCE AND ACADEMIC ACHIEVEMENT IN

ENGLISH AMONG UNDERGRADUATE STUDENTS”

DEFINITIONS OF THE TERMS

Relationship between Emotional intelligence and academic achievement in English among undergraduate students

Relationship

It is how two or more people or things are connected or the state of being connected. Hence by the relationship, the investigator means the association between emotional intelligence and leadership traits.

Emotion

Emotions can be understood as an agitated or excited state of mind and body. Emotions are feelings or affective experiences which are characterized by some physiological changes that generally lead them to perform some of the other types of behavioural acts.

Intelligence

Intelligence is the capacity to understand the world, to think rationally and use resources effectively when faced with challenges.

Emotional Intelligence

Emotional intelligence is the capacity for knowing one's emotions, managing emotions, motivating oneself and recognizing emotions in others and handling relationships. By emotional intelligence, the investigator in this study means the ability to achieve and apply knowledge from one's emotions and the emotions of others to be successful.

OBJECTIVES

1. To find out whether there is no significant difference between male and female undergraduates' student's in their emotional intelligence.
2. To find out whether there is no significant difference between urban and rural undergraduate students in their Emotional Intelligence.
3. To find out whether there is no significant difference between male and female of undergraduate's student's in academic achievement in English.
4. To find out whether there is no significant difference between rural and urban undergraduates' students in achievement in English.

HYPOTHESIS

1. There is no significant difference between male and female undergraduates' student's in their emotional intelligence.
2. There is no significant difference between urban and rural undergraduate students in their Emotional Intelligence.
3. There is no significant difference between male and female of undergraduate's student's in academic achievement in English.
4. There is no significant difference between rural and urban undergraduates' students in achievement in English.

REVIEW OF RELATED LITERATURE

Chong, ShyueChuan(2020) conducted a study on Emotional Intelligence and Job Performance of Academicians in Malaysia, International Journal of Higher Education, v9 n1 p69-80 2020, this study explores the predictive utility of an emotional intelligence measurement that is based on the Role-Based Performance Scale (RBPS) measure of job performance. This inquiry aims to investigate whether the level of emotional intelligence score of each academic staff in the selected private higher educational institutions affects job performance. This research applied a quantitative method approach to casting the researchers' net wider to include selected higher educational institutions to obtain as much data as possible. The results demonstrate a significant relationship between emotional intelligence and job performance of academic workers in private higher educational institutions. Therefore, these significant findings shed further light on the theoretical and practical utility of the construct of emotional intelligence and job performance, and have proven the fact that emotional intelligence is accountable for and could predict job performance.

METHODOLOGY- IN -BRIEF

POPULATION OF THE STUDY

“A population is any group of individual that have one or more characteristics in common that are of interest to the researcher. The population may be all the individuals of a particular type or more

restricted group” (John W. Best P.11). The population of the present study consists of undergraduate students

SAMPLE AND SAMPLING TECHNIQUE

“A sample is a small portion and analysis by observing the characteristics of the population from which it is drawn” (John W. Best P.11). The investigator has used a stratified random sampling technique. The investigators have randomly selected 240 undergraduate students from different Colleges selected through stratified random sampling technique.

STATISTICAL TECHNIQUES USED

Statistical techniques are necessary for an understanding of the general trends and group characteristics from a variety of individual characters. The investigator has used the following statistical techniques for analysis of data.

DATA ANALYSIS

According to John Galtung “Analysis of data refers to seeing the data in the light of hypotheses or research questions and the prevailing theories and drawing conclusions that are as answerable to theory formation as possible”.

EMOTIONAL INTELLIGENCE SCALE

Emotional Intelligence Scale (Constructed and Standardized by Sathiyagirirajan, S., (2010)). Seventy-five items are listed to represent Emotional Intelligence in day-to-day life, which have three alternative responses viz., Agree, Undecided and Disagree. Scoring was done by awarding 2 / 1 / 0 respectively. Thus the

score for a respondent could range between 0 and 150.

Scrutiny by Experts

The items were reworded based on the respondents’ reactions to ensure correct comprehension. These corrected items were subjected to scrutiny by a panel of experts comprising of teacher educators, psychologists, teachers and modifications were effected wherever needed, based on their comments.

Validity

(i) Content Validity

Content validity was established in the form of the modification and refinement of the prepared items based on the reactions of the subject experts.

(ii) Item Validity

Item validity was established in terms of significant discrimination items of high emotional intelligence group from low emotional intelligence group at 0.01 level. The tool is a highly valid one.

DIFFERENTIAL STUDIES IN EMOTIONAL INTELLIGENCE AND SEX

There is no significant difference between male and female undergraduates’ student’s in their emotional intelligence

The statistical measures and the results of the test of significance of the difference between the mean scores of emotional intelligences among undergraduates’ students in terms of Sex are presented in Table 1.

TABLE 1: STATISTICAL MEASURES AND RESULTS OF TEST OF SIGNIFICANCE FOR DIFFERENCE BETWEEN THE MEANS OF EMOTIONAL INTELLIGENCE: SEX- WISE

VARIABLE	SUB-VARIABLES	N	MEAN	SD	‘t’ - VALUE	SIGNIFICANCE AT 0.05 LEVEL
SEX	MALE	82	73.73	15.82	1.33	Not significant
	FEMALE	158	76.52	14.21		

The obtained ‘t’ value 1.33 is lesser than the table value 1.96 at 0.05 level of significance. This shows that there is no

significant difference between male and female undergraduates’ students in the possession of Emotional Intelligence.

undergraduate's student's emotional intelligence is independent of their sex.

EMOTIONAL INTELLIGENCE AND LOCATION

There is no significant difference between urban and rural undergraduate students in their Emotional Intelligence

The statistical measures and the results of the test of significance of the difference between the mean scores of emotional intelligences among undergraduates' students in terms of the locality are presented in Table 2.

TABLE 2: STATISTICAL MEASURES AND RESULTS OF TEST OF SIGNIFICANCE FOR DIFFERENCE BETWEEN THE MEANS OF EMOTIONAL INTELLIGENCE: LOCALITY- WISE

VARIABLE	SUB-VARIABLES	N	MEAN	SD	't' - VALUE	SIGNIFICANCE AT 0.05 LEVEL
LOCALITY	Urban	125	75.97	17.70	0.430	Not significant
	Rural	115	75.10	10.86		

The obtained 't' value 0.430 is lesser than the table value 1.96 at 0.05 level of significance. This shows that there is no significant difference between the undergraduates' students who are in Urban and rural in the possession of Emotional Intelligence. undergraduate's student's emotional intelligence is independent of their locality.

DIFFERENTIAL STUDIES IN ACADEMIC ACHIEVEMENT IN ENGLISH ACADEMIC ACHIEVEMENT IN ENGLISH AND SEX

There is no significant difference between male and female of undergraduate's student's in academic achievement in English. The statistical measures and the results of the test of significance of the difference between the mean scores of academic achievements in English in terms of Sex are presented in Table 3.

TABLE 3: STATISTICAL MEASURES AND RESULTS OF TEST OF SIGNIFICANCE FOR DIFFERENCE BETWEEN THE MEANS OF ACADEMIC ACHIEVEMENT IN ENGLISH: SEX- WISE

VARIABLE	SUB-VARIABLES	N	MEAN	SD	't' - VALUE	SIGNIFICANCE AT 0.05 LEVEL
SEX	MALE	82	76.32	10.511	3.366	SIGNIFICANT
	FEMALE	158	80.34	7.745		

(At 5% level of significance the table value of "t" is 1.96)

The obtained 't' value is 3.366 is greater than the table value 1.96 at 0.05 level of significance. The null hypothesis is "There is no significant difference between male and female of undergraduates student's academic achievement in English". Rejected. Hence there is a significant difference between male

and female of undergraduate's student's in academic achievement in English.

ACADEMIC ACHIEVEMENT IN ENGLISH AND LOCATION

There is no significant difference between rural and urban undergraduates' student's in achievement in English

The statistical measures and the results of the test of significance between rural and urban

undergraduates' student's in achievement in English in terms of location is presented in Table 4.

TABLE 4: STATISTICAL MEASURES AND RESULTS OF TEST OF SIGNIFICANCE FOR DIFFERENCE BETWEEN THE MEANS OF PERFORMANCE IN PHYSICS: LOCATION – WISE

VARIABLE	SUB-VARIABLES	N	MEAN	SD	't' - VALUE	SIGNIFICANCE AT 0.05 LEVEL
LOCALITY	Urban	125	80.20	9.038	2.239	significant
	Rural	115	77.63	8.744		

The obtained 't' value is 2.239 is greater than the table value 1.96 at 0.05 level of significance. The null hypothesis is "There is no significant difference between rural and urban undergraduates' student's in achievement in English". Rejected. Hence there is a significant difference between rural and urban undergraduates' student's in achievement in English

FINDING

- There is no significant difference between male and female undergraduates' student's in their emotional intelligence. This shows that there is no significant difference between male and female undergraduates' students in the possession of Emotional Intelligence. undergraduate's student's emotional intelligence is independent of their sex.
- There is no significant difference between urban and rural undergraduate students in their Emotional Intelligence. This shows that there is no significant difference between the undergraduates' students who are in Urban and rural in the possession of Emotional Intelligence. undergraduate's student's emotional intelligence is independent of their locality
- There is a significant difference between male and female of undergraduate's student's in academic achievement in English. Female

(M=80.34) is better performance than male students (M=76.32) in academic achievement in English.

- There is a significant difference between rural and urban undergraduates' students in achievement in English. Urban(M=80.20) students are better than rural(M=77.63) students in their performance of academic achievement in English

EDUCATIONAL IMPLICATIONS

Emotional Intelligence is vital correlates to teachers because without these no one can succeed in their life. Emotional intelligence plays a vital role in their career. One who has high Emotional intelligence live happily, whereas less level of Emotional Intelligent persons can not achieve anything. The teacher with a high level of emotional intelligence can do their work more effectively than the teachers with less level of intelligence.

SUGGESTIONS FOR FURTHER RESEARCH

The present study has enormous scope for the following further studies.

- The present study with the other type of schools.
- The present study with the other variables
- The replica of the present study with the college teachers.
- The replica of the present study with the other type of research instruments.

5. The replica of the present study with the other districts.

CONCLUSION

The current examination has created some significant outcomes that have suggestions in education. This study exhibited that parts of character, for example, sentiments and thinking, which have recently been distinguished as powers that may influence one's learning styles, enthusiastic

articulation, and passionate guideline (all elements of impact on passionate social knowledge), are significant determinants of scholastic achievement. In addition we found a connection between natural surroundings status and passionate insight. Further examination that grasps a wide scope of social, expert, and scholastic elements is justified to improve comprehension of passionate social knowledge.

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CINEMATOGRAPH FILMS ACT 1952: NEED TO RESTRUCTURE THE CENSOR BOARD

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ABSTRACT

In India there is an extensive debate over whether there is any need of the censor board or not. Some say that the censor board is killing the creativity, and the supporters of the censor board say that there will be no check on the content of cinematograph film and the under the name of creativity, even vulgarity or any content which is likely to instigate violence can also be depicted. It is true that the cinematograph film needs a pre censorship, however the current setup of censor board needs to be changed as the current setup of censor board has more powers than is necessary, there is excessive government control and lack of legal expertise on the panel.

Keywords : *creativity, vulgarity, cinematograph, censorship*

Introduction

The constitution of India has granted us the freedom of speech and expression as our fundamental right mentioned in article 19(1)(a), and it is said that the same cannot be compromised unless and until the exercise of these rights do not come in conflict with any limitation mentioned in Article 19 (2) of the constitution. However, currently it has been seen that the censor board with its powers vested, is not only causing a great prejudice to our fundamental right mentioned in article 19(1)(a), but also to the fundamental right of life and liberty of some people which is mentioned under the article 21 of our constitution. A question naturally arises that how can a censor board cause a prejudice to such a basic article of the constitution? and what can be done so that censor board will not come in conflict with the with the basic rights of the citizens? To answer these questions, we must analyze the birth of the censor board, its entry in India during British period, its constitutional validity, its functioning, its flaws, whether it is still relevant today and if yes how can the existing flaws can be removed and the censor board can be made as a useful tool in a democratic setup.

Origin of the censor board and its application during pre- independence era will not be too wrong to say that the censorship was born out of fire. In fact, the early film stock consisted of a compound named nitrocellulose, which was very

flammable. In 1897 there was a fire due to this flammable component in Paris, killing 126 people. There were similar incidences of fire being breaking due to the flammable substances used in the film stock. These repeated incidences were responsible for formulation of the world's first legislation relating to cinematograph in the year 1909 in Britain, in order to improve safety standards, by regulating the issue of licences issued to the cinema. One type of control led to another and the authority which was for ensuring the safety standards where the film was to be screened, started to indulge in the content of the films.

The film censorship came to India by the Cinematograph Act 1918. Cinematograph Act 1918 gave the district magistrates (in case of Rangoon, the commissioner of police) the powers to appoint inspectors to examine and certify the films. The interesting point is that though the inspectors were supposed to certify the films, the Act did not give any guidelines as to how they shall be certifying the films. Thus the District magistrates had very wide discretionary powers regarding the censoring of films. Some guidelines regarding the criteria of censor came in the year 1920, when censor boards were set up in Bombay, Madras, Calcutta and Rangoon.

In the year 1921 the regional Madras censor board banned a movie named 'Bhakth Vidhur', because the main character of the film had a resemblance of Gandhiji. On the other hand, in year 1929, Seeta Devi,

went on to kiss Charu Roy, in the movie 'A Throw of Dice', which was passed by the censor board. Another actress Zubeida in skimpy dresses had created a sensation, failed to attract the scissors of censor. From all the above facts, the motive of the censor board during the British era becomes very clear that it would not allow any film or a scene in a film, or even the photograph of any national leader in a film, which would in any way promote Indian nationalism, rather than making any serious attempts to provide healthy entertainment to the public by suppressing vulgarity. In short it can be safely said that, during the British era, the censor board was being used as a tool to suppress the national spirit, rather than enhance the standards of the films.

If one ponders as to why the censor board was so narrow minded, the answer was simple, as firstly, during the British rule there was no democracy in India, the British people did not consider Indians as one of them; hence they did not bother about the fundamental right of any Indian film maker or the viewers. They were more concerned about the stability of their rule, which would come in danger, if the nationalistic feelings in the minds of the people were promoted through the medium of films.

The position of the Censor board in post-independence era.

One of the significant developments after independence was that the right to press and subsequently the right to display motion pictures was incorporated into article 19(1)(a) of the constitution. This was because in the assembly debate Dr. Babasaheb Ambedkar has strongly argued that "The press is merely another way of stating an individual or a citizen. The press has no special rights which are not to be given or which are not to be given or which are not to be exercised by the citizen in his individual capacity. The editors of press or the manager are all citizens and therefore when they choose to write in newspaper they are merely exercising their right of freedom of speech and expression and in my judgment therefore no special mention is necessary of the freedom of press at all"

After the independence the scenario relating to the censorship changed. All the

regional boards were absorbed into one Bombay Board of Film Censor. The Cinematograph film Act 1952 was passed, by way of which the name was changed to Central Board of Film Certification, which was a statutory body. The vision and mission of the censor board were clearly stated, and looked very attractive. The stage was set where the fundamental rights of the film makers and the viewers would not only be protected, but also good tastes of the viewers and the creativity of the film makers would be promoted. The government's interference would be minimal and the board will encourage the creativity of the filmmakers and generously offer the filmmakers the platform to put his views, through the medium of films. However, as the time passed, the hopes regarding the ideal functioning of the censor board, and the minimum interference of the government were crashed and the reality proved to be the stark opposite of what was envisaged. The censor board became a tool in the hands of the government, the filmmaker's creativity was compromised, and the viewers were forced to watch what the censor board passed, and what the government wants the people to watch.

Constitution and the appointment process of the censor board.

Let us now analyse the effects of the censor board becoming a tool in the hands of the government in detail. To effectively analyse this, we need to have a look at the constitution of the censor board, the appointment process and the term of the censor board.

The censor board consists of a Chairman and non-official members, all of whom are appointed by the Central Government. It is headquartered in Mumbai, Maharashtra. Additionally, it has nine Regional offices, namely, Chennai, Bangalore, Hyderabad, New Delhi, Guwahati, Cuttack, Kolkata and Thiruvananthapuram. Regional Offices, as mentioned above, are assisted by the Advisory Panels. The Advisory Panels, like the Board, is selected by the Central government. The members chosen for the panel are from different walks of life. It has a

two-tier jury system, the Examining Committee and the Revising Committee. The Chairman and the members are appointed by the Information and Broadcasting Ministry, and though the term of these members is of two years, their term can be extended or curtailed as per the pleasure of the Information and Broadcasting Ministry.

Constitutional Validity of the censor board

The Supreme Court had upheld the validity of the censor board in *K.A Abbas v. Union of India*, where the Supreme Court held that the pre censorship regarding the motion pictures is a valid restriction on the fundamental rights. The researcher merely wishes that there should not be excessive control of the government regarding the exhibition of the motion pictures.

Influence of the government censor board Whenever the government at the centre changes, then the head of the censor board changes. When in the Bharatiya Janata Party came in power, Anupam Kher was appointed as censor board chief in 2003. When Congress Government came in power in 2004, Anupam Kher was removed and Sharmila Tagore was appointed.

The central government's control on the censor board is far more than mere changing the chiefs of the censor board. The two glaring examples are, one regarding the film *Andhi*, which was not allowed to be screened, despite being passed by the censor board, because it had resemblance of the then Prime Minister Indira Gandhi. The second one about a political spoof movie *Kissa Kursi Ka* in the year 1977, also could not be screened, despite of having clearance of the censor board, because it was supposed to be critical on the policies of Indira Gandhi and Sanjay Gandhi.

With these wide powers enjoyed by the government, the right to criticise the government, which is very essential in any healthy democracy is greatly prejudiced. More importantly the by making of a film the film maker not only exercise his freedom of speech and expression, but the filmmaker and all those who are involved in making of the film are exercising their right of livelihood, another essential fundamental right of a citizen. Also a film is not completed in a day

or two, so considerable time is spent during the making of that particular film. If the film is rejected either by the censor board or the central government, then the fundamental rights granted under Article 19(1) (a) and Article 21 of the filmmaker and the others who are involved in filmmaking are greatly prejudiced.

Flaws existing in the current system of censorship Despite the opinions against the existence of the censor board, researcher strongly feels that there shall be a pre censorship relating to the motion pictures, as the same have a capacity to impact the human minds in a far better way than any other form of media.

However according to the researcher the current system of censorship have some grave flaws.

The current system of censorship tends to overlook the fundamental rights of all the people who are associated with the film. Another major flaw is the central government enjoys virtually a dictatorial position as the members of the censor board cannot dare to pass any film which may be critical of the central government, because the appointment and removal of the board members is in the hands the central government. This position which is presently enjoyed by the central government virtually takes away the right of criticism and freedom of expression to a great extend, thus diplomatically sidelining the Supreme Court's contention in *Shreya Singhal v. Union of India* case where the apex court had stated that liberty of thought and expression is a paramount significance under our constitutional scheme.

Conclusion and suggestions

The researcher hence gives the following suggestions so that the pre censorship relating to the motion picture will be meaningful and not arbitrary.

(a) The censor board shall be made a statutory body with fixed term, independent system of appointment and removal of the members, without any interference from the central government. There is no harm in including not more than two members from or on the behalf of the central government.

(b)The censor board should only be a certifying authority. This can be done by amending the Section 5B of the Cinematograph Act 1952, which authorises the censor board to refuse the film from being exhibited. By way of such amendment, the authority of the censor board should be limited only till cutting few parts in the film, which may tend to corrupt the minds of the people.

(c)However before applying the scissors on any part of the film, the censor board shall take into consideration that it is not denying the creative platform to the filmmaker, or compromising with the essence of the story itself. However it is also equally true, that the filmmakers under the guise of creativity should not depict or promote anything which

is in bad taste, against the public policy or against the morality or decency.

(d)There shall be adequate number of legal experts at prominent positions in the censor board, as the censor board is, in a way is doing interpretation of the Cinematograph Act 1952, when it is censoring the film. This is why; the help of legal experts will be of great value.

(e)The board should honestly strive for being as consistent and transparent as possible.

(f)The central government as well as the various state governments shall not refuse any film, which is duly certified by the censor board on mere apprehensions of breach of peace or just because they are critical about their policies.

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CORPORATE RESTRUCTURE: STRUCTURING THE STRUCTURE

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ABSTRACT

Corporate restructuring is one of the most vital concepts that is popularly used in the reconstruction of corporate elements. As its name indicates, it is one of the concepts used in the business world, especially during the "Mergers and Acquisitions" of any corporate entity. It is considered a measure of rebuilding which is done due to any organizational obscurity or to tackle fiscal issues. In laymen terms, it can be considered as one of the other methodologies that are used to prevent the company from being liquidated. This structuring of the already present structure can be done in various ways, for example, acquisition, buyback of shares, mergers, etc. Corporate restructuring can also be considered as an umbrella term which enunciates various aspects of overcoming any financial crisis, to reduce competencies, to mitigate risks faced by the company as a whole. This concept of saving the organization has gained popularity due to rapid technological improvements, globalizations, etc. This conception can also be used for both short-term and long-term corporate goals. It also plays a key role in maximizing profits for an entity.

Keywords- Corporate, Restructuring, Mergers, Acquisitions, Amalgamations, Organizations.

Introduction: -

Corporate restructuring is a method adapted by body corporates and organizations to modify its capital structure and compartmentalize its internal operations and hierarchy in order to move towards the profit motive. This measure is generally brought into action when the entity has anticipated a possible set back in its operations. In order to proceed with the process the corporations generally hire some experts or advisors to investigate the matter. Usually these assigned people take cognizance of the operational and working structure of the company. They also look into the interest of the investors. In addition to this, the corporate restructuring also involves the change of ownership if required when the matters involve situations like takeovers, acquisitions etc. Generally, there are two types of corporate restructuring which takes place, named as financial restructuring and organizational restructuring. Financial restructuring is one type of arrangement which is done in order to save the company from any ongoing economic crisis, in order to curb out this issue, they try to bring about changes in their debt equity ratio, equity patterns and any other type of holdings. In comparison to financial restructuring, there lies another measure

called organizational structuring. It can be considered as a homogenous arrangement which is done within the organization either by redesigning the current jobs, doing certain lay off, altering relations within the organization etc. This is primarily done in lieu of certain cost reductions.

Reasons for Corporate Restructuring: -

Corporate restructuring can be carried out in any organization for various reasons such as when there are some modifications in the MOA and AOA of the legal person. These amendments as stipulated in Section 13 or Section 14 of the Companies Act 2013 could lead to various changes to the corporate structure or strategy. In such a situation, companies can decide to focus on their primary goal and eliminate all other goals. Any legal person [1] with a sole purpose of making profits, if they face any kind of distress in order to achieve the same thing, they start making changes in their organization in order to revive themselves to a new degree. Sometimes organizations also go along with the saying "one is better than many", as they try to abandon their origins, also known as reverse synergy. Another reason could be the disposal of their non-producing assets which ultimately created a liability for that company.

Moreover, after the restructuring is done, it helps to reduce costs, and also tries to focus the company on more of its fundamentals and accounts. Once merged with another company it helps in expanding the business. It is also beneficial for its survival and success. Corporate restructuring itself is a process that needs planning and appropriate actions to be implemented. The actual time required depends entirely on the nature of the restructuring that takes place. Sometimes, there is a situation where this process is pursued instead of bankruptcy, business expansion, resurrection of a sick company, and in all of these cases, the process and steps used differ, which need time to plan [2]. The company administrator is appointed to himself who assesses the situation, performs all kinds of risk assessment, analyzes all pending legal issues [3](if any), and does a planned work, which is followed later. It is crucial to establish a list of guidelines for all phases of restructuring in order to go through a smooth process of reforming or redeploying entities. The first thing to consider is defining the appropriate arena for the restructuring and the reasons supporting the restructure. This kind of corporate reshuffle need not necessarily involve society as a whole in this step. Moreover, the SWOT analysis helps in identifying the strengths and weaknesses of an already existing structure. Accordingly, a short-term and long-term plan is made, followed by the calculation and security of funds.

Types of Corporate Restructuring: -

In our initial days we go by a saying called “small is beautiful”, but eventually the saying has taken a toll into the consideration of “big is beautiful”. Deriving this concept in the corporate world we have various types of Corporate Restructuring, which eventually and generally changes the corporate structure immensely, into various different and new objectives. For instance, we have a concept of Amalgamation, which is stated in the Income Tax Act in its true sense but is a process in which existing multiple entities combines and form into one. The best illustration which can be quoted here can be of India based Maruti Motors which amalgamated with Japan’s Suzuki and was converted into a single entity

which emerged as the leading automobile industry as Maruti Suzuki Ltd.

A unique form of restructuring is reverse merger in which the private company purchases the shares of a public company and also the control of the board, the same which happened in the case of ICICI bank in 2002 which merged with its parent company, such types of situations are common in US.

Demerger is also a unique arrangement [4] which is done to save the company from upcoming losses. It’s an act of splitting off with an existing company to become a new company which would have its own separate legal identity.

Another type of restructuring is purchasing of one company by another, which is also known as Takeover. The takeover at times can be friendly as well as hostile. When one party resists its takeover then it is known as hostile takeover, and when the party gladly expects such arrangements is known as friendly takeover.

At times when the company is into business it is into impression that it does not require certain assets, it sells off those parts this is also a type of rearrangement which is known as disinvestment.

Section 68 of Companies Act 2013, instates the concept of buy back of shares i.e. in order to reduce risk at times the company repurchase its own outstanding shares from the market, this also accounts as a type of corporate restructuring. By overserving the various types of corporate restructuring, we can come to a conclusion that it is one of the few modified processes [5] which helps an artificial legal person to formulate a new identity as well as restore, repurchase and exchange the value of their organizations.

Legal Procedure: -

The Ministry of Corporate Affairs vide its notification on 14th December, 2016 issued certain rules on Companies (Compromise, Arrangements & Amalgamations) Rules 2016. These rules are guided under the provision of the Companies Act 2013 (specifically under sections 230, 231 & 232), which provides for the restructuring of the companies under the legal head. There are certain procedures mentioned

which are covered under these regulations which becomes mandatory for all the organization (as per their capital structure) to be taken into consideration.

The process is first initiated by convening a board meeting where the restructuring process is discussed at a stretch. Further the minutes of the meeting along with a scheme of compromise discussed with an affidavit is submitted to NCLT for its reconsideration. After the order of the tribunal is received there is another board meeting which is been scheduled, the notice of this meeting is circulated to all the creditors and class of creditors and to all the members and different types of members associated with the company, along with the date, order and its venue. The notice of the meeting is been advertised in one of the English newspapers and also in one of the vernacular newspapers for wide circulation. Furthermore, the aforesaid notice along with the copy of the restructuring is also send to various authorities, who will be affected by the restructuring. Last but not the least a final meeting is conducted by the authority along with all the details, to accord the sanction for the same. The Company Law[6] statute also provides some perks related to the fast track mergers, and even the central government have certain powers to regulate them when it comes to the matter of public interest. They also look into account the rights and interests of the minority shareholders dealing with such restructuring.

The Legal procedure under the Corporate Restructuring also includes the ambit of the relevant market structure. No such mergers are allowed which can account to monopoly or any dominant position of the player in the market, which is further regulated under the Competition (Amendment) Act, 2009. No such mergers are allowed or Combinations under section 5 of the Competition Act, 2000 which demarcates a "Threshold Limit", and can create issues in the relevant market structure. Furthermore, it also emphasizes on the promotion of consumer interests and ensures free trade being carried by all the participants across the globe. They also have a regulating body called Competition Commission of

India (CCI) which acts like a watchdog and keep a check throughout.

There is also a tax aspect which is involved in the whole process, the new entity formed after the restructuring is also been regulated by the Indian Stamp Act, and pays revenues at large, because they are covered under the ambit of an "Instrument". This also implies one basic ideology that even governments earn a lot from the corporate world and thus accelerates such growths. One more aspect which was recently added was reviving the sick companies now under the Insolvency and Bankruptcy Code of 2016, which was earlier done under the SICA Legislation. This is also a type of corporate restructuring done in order to save the company from the ongoing losses.

One another important part of this whole process is the concept of "Cross Border Mergers" which is regulated under the Foreign Exchange Management Act 1991, which looks into the Inbound and Outbound Mergers. Where one Indian company merges with a foreign company for promoting foreign exchange market in India, they try to regulate any kind of contravention which might occur during these transactions[7]. One important aspect which needs to be followed and regulated throughout is the concept of "due diligence", corporate restructuring is one such wide term which involves various factors, but it becomes the responsibility of all the people involved in the whole transaction to facilitate the entire process with utmost care and without any contravention with the legal procedure.

Conclusion: -

By evaluating everything studied and observed so far, it can be finally concluded that "Corporate Restructuring" is one such *sui generis* process in the corporate world which is coupled with prospects in all ways. However, it is to be carried out with minimal negligence. Key attention is also to be paid to legal norms which are to be complied with in the entire process. In addition to all the advantages, the process of corporate restructuring helps in achieving a new strengthened regime for a corporate entity. It advances a dimension of work which would

give a fresh start to both the entity and the creditor. Corporate Restructuring aids in creating a new survival strategy for the

organization. Nevertheless, corporate restructuring has its own set of shortcomings.

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CHALLENGES IN LEGAL EDUCATION**Ajay Arya¹, Dr.Sapna Deo²,**¹Ph.D Scholar ,BharatiVidyapeeth (Deemed to be University), New Law College,Pune²Ph.D Guide, Assistant Professor ,BharatiVidyapeeth (Deemed to be University), New Law College, Pune**ABSTRACT**

Indian Higher Education is in a continuing process of changes in orientation & methodology. This is a short article representing about the legal education in India within a wider context of legal education reform that is taking place in the law schools. Legal education for being both intellectually challenging and professionally relevant should be more responsible than it was before. Legal education should be made more precise so that the students, who are studying law, can be professionally competent to serve the legal needs of the society and are capable to play their role in an increasingly growing legal service market. In this article, there is also a great emphasis on the basic law knowledge that should be given to students of every stream so that they can have the basic knowledge of law and can decide whether to come into this profession or not. This article speaks about the goals of the legal education, the status of legal education in India and also about the challenges and shortcomings of the legal education system. This article concludes with some reflections and positive views on having a different vision of legal education.

Keywords: *Legal education, Law Remedies, universities, effective and justice*

Introduction

Professor SatyaranjanPurushottamSathe has defined that Legal education is essentially a multi-disciplined, multi-purpose education which can develop the human resources and idealism needed to strengthen the legal system. A lawyer, a product of such education would be able to contribute to national development and social change in a much more constructive manner. Law, legal education, development and globalisation are none other but one and the same thing in the modern era of rapidly growing social institutions and societies. Law cannot be preached rightly and correctly with proper distinctive legal education and the progression in the field of development cannot be seen. Without any slightest inflation in the graph of development, the graph of globalisation cannot swell. The understanding of law comes well versed when not only the laws abiding are studied but also the correct procedure to implement them. The correct way to implement laws can only be known when one is aware about the technicalities and complexity implemented in day to day life in the legal profession.

Legal education is defined as a science as a science which imparts to students,

knowledge of certain principles and provisions of law with a view to enable them to enter into the legal profession by the Law Commission Of India. Legal education is a concept of utmost importance and plays a vital and significant role in implementation of the cherished ideas of justice, liberty, equality and fraternity laid down by the framers of the Constitution.

Justice Krishna Iyer said 'Profession of law is a noble calling and the members of the Legal profession occupy a very high status.' Law is the foundation of every society and it develops abiding citizens, lawyers, academicians and aspiring judges. Legal education in India refers to education of lawyers before their entry into practice.

Quoted by the encyclopaedia of education, Legal education is depicted as a skill for human knowledge which is universally relevant to the lawyers art. This fact must be among one of the core principles of each and every institution where the education of legal field is imparted. Lawyers of the country should be groomed in such a way and made well versed with the common code so as they may undertake their practice of law with a spiritual aspect rather than blind professionalism for the unending thirst of

money and fame. There are numerous proficient lawyers in India who practiced law and imparted legal education to many just for the sake of their own conscience and such should be the motive of each and every individual thriving to get education in the legal field.

Legal education cannot be explicitly said to be just the study of law and order prevailing in the present area of jurisprudence but in the ambit of Legal education a lot of aspects need to be covered. As the law cannot be studied by merely studying the acts and statutes, similarly the legal education cannot be said to be imparted totally and correctly by such methods. There are certain very important subheads to be covered under the tag of legal education:

- Social Aspect: Law needs to be governed under the peers of the society and hence it is very essential that proper and in-depth knowledge of the societies, its members, their behaviours and their social entities to collaborate the law with them and ensure the further impartation of true justice.
- Political Aspect: Since all of the politics in a country is governed by its Constitution, it is essential that the upcoming emerging lawyers have full knowledge of the law abiding by the citizens and the government.
- Historical Aspect: Law and legal education is such as field where laws keep getting amended and a lot of it becomes history to which the upcoming budding lawyers need to be acquainted so as to be well versed with the happenings that occurred previously for the law, code and order to attain loophole free status.
- Economic Aspect: The economy of a any nation is greatly depicted by rule of law as the justice dispensed rightly ensures the healthy economic development free from corruption and liquidation of money.

Goals of Legal Education

The main goal of legal education is to provide for :

1. An open platform where legal scholars can receive and further contribute to the enhancement of legal education.
2. Provide for freedom so that the scholars can pay heed to the vacuum areas of law where there is utter need for law enforcement.
3. Impartation of legal education in such a manner that growth, evolution and improvement of legal norms is ensured.
4. Both substantive and procedural law must be inculcated into every single law student.
5. All legal scholars must essentially have sufficient knowledge of the historical, political and sociological background behind the proactive legal system of their own country.
6. The students should not only be acquainted with the law of their country but also with the international statuses of the legal system prevailing so as to whenever it comes to a comparative study, the legal scholars of our country do not find themselves at a loss.

The law school of each country keep thriving to reach such goals which is none less than a moonwalk for them as it is the state of legal education is deplorable in many countries while most of them are not even known to the law.

State of Legal Education in India

The Constitution of India originally laid down the duty of imparting education on the States by placing the matter pertaining to education in List II of the Seventh Schedule. But it now forms part of List III, giving concurrent legislative powers to the Union and the States. Legal profession along with the medical and other professions also falls under List III (Entry 26). However, the Union is empowered to coordinate and determine standards in institutions for higher education or research and scientific and technical institutions besides having exclusive power, inter alia, pertaining to educational institutions of national

importance, professional, vocational or technical training and promotion of special studies or research.

“There should be a proper evaluation of papers in the examination. The students should be trained to draft pleadings at the college level. The standard of English should be improved. Under Rule 9 (1) to (4) by Section – A, Part-IV of The Bar Council of India Rules (under The Advocates’ Act 1961) deals with the subjects to be covered to complete the respective courses”. Now in India, the Bar Council Of India is empowered to prescribe standards of legal education and recognition of law degrees for enrolment of persons as advocates. At present, there were about 21 national law universities in India and about 1200 law colleges including public and private universities.

Comparative Study

In the international aspect, the subject of legal education is given full consideration and the knowledge imparted is not only subjective but also of practical use. The legal education taught internationally contains all aspects, be it fluent client interaction, correct criminal interception, or drafting clauses of any contract. There is no limitation in the education of ambit of legal education imparted by the foreign law schools and the students come out as all rounder with basics of legal language clear as crystal to them. The subjects of all legal procedures in all the laws and statutes are shown light upon by the law schools all over the world. In all the international schools of law, legal education imparts many aspects to its students who aspire to be future lawyers such as conducting mergers and acquisitions, formulating testimonies and many other E-documents with their respective translations for the layman.

Many kinds of complications occur when such lawyers are produced by Indian Law schools which are unknown to the subject of the legal education. These lawyers know less about the procedures to implement laws than they know about the laws and hence they are rendered helpless. These lawyers can’t even stay firm and their provident position in the

field of law is very temporary. The span of such lawyers in the legal field is very limited as they have least knowledge of the basics of the legal education and hence they cannot be successful. The legal education imparts not only the general idea of law to its students but also gives the right and practical knowledge of dealing with everyone who is in need of law and the lawyers who are known to legal education can help and provide everyone with the law by taking correct measures.

As the alphabet is taught to tiny tots to make them well versed with the English Language, legal Education needs to be taught to every law student to make them well versed with the law. When the students are not taught the legal education profoundly, the emerging lawyers tend to commit mistakes such as inducing formalism, rhetoric, and jargons. Hence it is very important in all of the law schools in India to implement the studies of correct legal education and if they are already imparting knowledge in the same, they urgently need to upgrade the degree of the education imparted by them in the subject of legal studies. The future lawyers produced by the Indian law schools would be well graduated only when they are imparted with the full knowledge of legal education and hence all of the institutions teaching law must implement necessary measures for the best education imparted ever.

Challenges and Shortcomings

It has been a long time since the role of advocates, lawyers, jurists and paralegals has changed in a vast way. Now not only the knowledge of law is expected from them but also the practical insight into any situation to look into it without prejudice. The Indian law schools thrive towards providing the same to all legal scholars then too we are far behind from the rabbit pulling lawyers from their hats of international origin. There are a number of challenges faced in impartation of correct and total legal education to the scholars.

Outdated curriculum and syllabus

Many private institutions keep on imparting education in law by merely providing the scholars with general knowledge of the subjects like Indian Penal Code, Code of

Criminal Procedure, Code of Civil Procedure, Evidence Act, Constitution of India. They make the subject purely theoretical and the newly joined scholars do not even get a glimpse of good understanding of it. Hence the syllabus of a majority of law schools in India needs a reformation.

Quality of education

The quality of education imparted is widely different in all the law schools all over the country. There are law schools where more or less every concept is vividly explained and the understanding of each and every legal scholar is enhanced while there are also some institutes of legal studies existing where one doesn't even meet the basic criteria of legal education. Hence the distance between both such colleges needs to be reduced.

Assessment of examinations

There should be strict assessment of examinations and the questions asked in the examinations of all the law schools should be practical and not theoretical. Mostly, it is seen and observed that the case with most of the legal scholars is that they mug up the code and its statutes and pass the examinations with flying colours.

Research and learning

In India, there is least research about the law and most of it is easily memorised or used by lawyers by quoting them but no research is done about how those laws came into existing and basically no learning is based on that information.

Zero practical approach

In National Law Universities of India, there is inevitable impartation of legal education based on practical experience and knowledge but in most of the private institutions that give degrees in law cannot make their students well versed in the theoretical knowledge of law, let alone the practical approach which they should provide.

Medium of Teaching

Many students in India face communication gap when their education imparted to them is not in their mother tongue as they are less known to the other languages. Some of institutions of legal education impart

knowledge in English medium but the scholars may be not be acquainted with the language and hence they do not get the concept.

Vast difference between law schools

There is a wide gap between all the law colleges ranging from the education imparted at National Law Universities of India to the very basic legal education imparted at the private institutions of legal studies that impart knowledge in the most rural areas of the country. Thus, these differences need to be reduced and the legal education imparted all over the country needs to be brought at a par.

Misuse of the Honours degree

Most of the private institutions that are money oriented conveniently misuse the honours degree for their own profits and hand over the honours degree to many students without their specialization in any legal subject.

None international programs and experience

There are only a handful of colleges that urge their students to pursue internships abroad and experience the exposure provided by the foreign Law Universities. Rest most of the Indian Law schools do not pay much heed to the programs they need to provide for students and the students pass out with no experience at all.

Conclusion

The law is the strength of our society and an essential medium of revolution. It is the only profession that deals with the society as a whole and its problems. The legal education has taken a drastic change in the past 10 years but it still needs reforms to make the laws effective and justice oriented. These issues pose a formidable challenge to legal education. How law schools should respond depends in part on self-evaluation by each school because some of the challenges pose peculiarly local issues. Others require a response by legal education, and still others require consideration by the profession as a whole. Neither legal education nor the legal profession is known, however, for a capacity to provide unified approaches to difficult issues. Nor is either prone to move swiftly into un-charted seas.

The main emphasis should be laid on the base, the research activities done and mainly on the faculty members. They should be best trained with the basic legal education so that they can prepare the students well from the base itself. Also, the introduction of law subjects should be done at school level so as to ensure the basic knowledge of law to students. This would eventually help in growth and development of legal education with increase in the reputation of the profession to meet the

challenges of the field and to grow and grab opportunities by the law aspirants for the progress of the country. The first step is to recognize that some changes may be needed in what we do, how we do it, and how we pay for it. It is the purpose of this symposium to ventilate these matters. Change doesn't come easily to those who have seen efforts to reinvent the wheel several times and who remember the 1950's and before.

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INFLUENCE OF FIRST WORLD WAR ON INDIAN NATIONALISM: HOME RULE SURGE IN TAMIL NADU

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ABSTRACT:

The First World War had its impact on world countries. In the case of India, the war accelerated nationalist sentiments among the people of different ranks. The home rule movement, launched in the backdrop of the war, pressurized the British to think over developing democracy in India. To pressurize the government, Mrs. Besant evolved a number of educative programs in order to evoke the nationalism among the people through New India and Common Weal. Besides, she also constituted number of youth associations to make them serve India with utmost spirit and enthusiasm. Amidst of the war, the government interned Mrs. Besant and others to curtail the home rule movement. In contrary to the calculation of the government, the arrest of the nationalist added some stimulation to the movement. And, at last, the government Montague Chelmsford report came into effect from 1919 which stressed over the self-government.

Keywords: All India Home Rule League – Mrs. Besant – Home Rule Propaganda – Internment of Mrs. Besant – Release – Declaration of Montague Report – Attainment of Objectives.

Introduction

The First World War had its own repercussion all over the world including the smallest geographical area of Tamil Nadu. With the outbreak of war, Mrs. Besant emerged as indubitable leader. She not only responded for uniting the Congress but also awakened the spirit of nationalism and Swaraj. In order to achieve the object of Home Rule (self-government), on September 1916, Mrs. Besant formally inaugurated the All India Home Rule League at a meeting held at Gokhale Hall, Madras. A very large number of members and associates attended the meeting and about 500 persons enrolled themselves as members of the League. According to Mrs. Besant, the League would consist of two divisions, one in India and the other in England. The function of League in England was to educate the English about the conditions of Indians.¹ Mrs. Besant clarified the objectives of the League through her propaganda meetings, newspapers, books and pamphlets.² In the villages, the Home Rulers distributed vernacular pamphlets. She tried to get the sympathy and support of the student population by instituting Home Rule classes and forming Boy Scouts and volunteer troops

for them. She indicated that the objectives of the League in India were,

- a) To secure Home Rule for India through all law-abiding and constitutional activity.
- b) To maintain the connection of Great Britain by becoming a free nation within the British Empire.
- c) To support and strengthen the Indian National Congress which has labored for thirty years to lay the foundations of Indian Self-Government and
- d) To carry on a continuous educative propaganda on the necessity of Home Rule for India.³

The government of Madras reacted against the move of Mrs. Besant. It persuaded Mrs. Besant to drop her propaganda, but in vain. An Executive Council of Home Rule League was constituted with seven office bearers. Mrs. Besant was elected as its President, Arundale as organizing secretary, C.P. Ramasamy Iyer as general secretary and B.P. Wadia as the treasurer. Both men and women above the age of eighteen who accepted the objectives of the League were enlisted as members. School students were not admitted as members. However undergraduates were enlisted as associates.⁴ More than 100 students from various colleges

in Madras enrolled themselves as members of the League. A silver pendant with a pointed star of the Indian Empire with 'Home Rule' in red, engraved in the centre, was the badge of the Home Rule League. The colours were red (Hindus), white (Christians) and green (Muslims). The All India Home Rule League had its own flag in red, white and green.⁵

The constitutional links between the headquarters of the League and its branches were rather tenuous. No elaborate organization was prescribed so that, any three persons might form a branch. The result was that some 200 branches of the League were established, each one enjoying virtual autonomy and being confined to a town or a group of villages. The entry fee was one rupee. The organizing secretary was permitted to sanction the formation of branches. Mrs. Besant maintained communication through individuals who were either active in a particular branch or were in touch with a number of branches. The official and business meetings were held at its headquarters, Adyar.⁶ The constitutional link between the headquarters and its branches were most tenuous. Three persons may form a branch. The organizing secretary simply sanctioned the formation of the branches. The headquarters conveyed instructions through those active people, or through *New India*, in which Arundale edited a page of 'Home Rule News and Advice' in each issue.⁷

By October 1916, the number of branches of Home Rule League in Tamil Nadu swelled more than 50 including Madras, Kancheepuram, Erode, Nagapatnam, Cuddalore, Salem, Tanjore, Tirupur and Trichinopoly. Most of the members were theosophists and Sanmarkins. In March 1917, the total number of membership of the league hit 27,000. The function of the All India Home Rule Leagues was to contribute to the rousing of agitations in Tamil Nadu.⁸ Mrs. Besant advised the branches how to undertake Home Rule activities. It was also instructed that the members of the League, should discuss the political facts, set up classes to lecture students on political matters and set up libraries containing printed speeches by Indian Nationalists, newspapers and works by J.S. Mill and others. Most of the branches had

opened reading rooms and held regular discussions. The branches also held public meetings, rallies, etc. The Theosophists helped in strengthening the Home Rule Leagues branches. The strength of the League reflected in the strength of the Theosophical lodges. In Tamil Nadu, the Theosophical lodges were more than elsewhere in India.⁹

To advocate the Home Rule ideologies, Mrs. Besant launched two papers, *the Common Weal*, a weekly and *the New India*, a daily, popularized the demand for the Home Rule. It may be said that her press played a vital role in popularizing her political ideas. The first issue of the weekly appeared on 2 January, 1914. The term *Common Weal* as named by Mrs. Besant refers to 'public welfare'. The first two pages had editorial notes and the rest of the paper dealt with the then politics, local and foreign. These notes usually contained references to or summaries of the principal political articles. The paper insisted for the imperative necessity of the self-governing powers of India. The works authored by Mrs. Besant like *The Natural History of the Christian Devil*, *Self Government for India*, *Political Outlook*, *Separation of Judicial and Executive*, *The Future of Young India*, *East and West in India*, *Under the Congress Flag and Home Rule* were published in the *Common Weal*.¹⁰

The Common Weal contained many articles on Home Rule. The way it defined nationalism is as follows: "Our nation is heterogeneous. It must be a united one too. National factors collected together the several component factors such as Hindus striving for the advancement of Hindu community and Mohammedans working for the progress of their co-religionists. It really helped the progress of India and also it paved the way for the Hindu-Muslim unity". It propagated for building up of complete self-government from village councils, through district and municipal boards and provincial legislative assemblies to a national parliament, equal in its power to the legislative of the self governing colonies, direct representation of India in the Imperial Parliament when that body shall contain representatives of a self governing states of the empire. It claimed for Indians every post in their native land as

promised in the proclamation of 1858 and the abolition of every law that places claim in a position inferior to that enjoyed by the English. It stressed that capacity and high character shall determine all appointments to office and that colour and religion shall be entirely disregarded as qualifications. Altogether, it worked for the revival of Indian national life. It also clearly pointed out the self rule should be the goal of the Indians. It never ceased to declare India's fitness for complete self-government and to demand for equal status among the civilized nations of the world. In the paper she said the students should take the examples of 'Young Italy' and 'Young Russia' with their right feeling or enthusiasm to sacrifice themselves for the cause of their country.¹¹

The *New India* provided a fulcrum to the nationalistic activities of All India Home Rule of Mrs. Besant. It made approach in grass-root level. The motto of the New India was to be without fear and without favour. The paper gave wide coverage of colonial policy and British hesitation to grant swaraj to India. It is known for its authenticity, meaningfulness, crisp presentation and the stand for Home Rule. From 1100 copies in July 1914, the New India increased to 5000 in August and it became the national champion of swaraj.¹² The first article of *New India* outlined the proposal for constitutional agitation against English government. Another one was a virulent attack on the judges of Madras High Court for their racial attitude. New India dated 25 September, 1916 published the Home Rule League Manifesto and sent to all the Indian papers.¹³ The *New India* added that the object of the League is to begin at once a 'strong, steady and sustained agitation' in the press and on the platform for swaraj. The paper also criticized the racial attitude British officials in the sphere of military, judiciary and other fields.¹⁴

Mrs. Besant delivered innumerable lectures across Tamil Nadu. Mrs. Besant's demanded Swaraj which was supported by different sections of the society like landholders, merchants, rickshaw pullers and factory workers as well as women and students. Huge landed proprietors include Raja of Ramnad and a large number of

educated elites supported the Home Rule Movement by financial assistance as well as rendering volunteership.¹⁵ The popular nationalists of Tamil Nadu such as Satyamurti, S. Subramaniam, C.P. Ramasamy Iyer, G.A. Natesan, L.A. Govindha Ragava were ardent supporters of the League. They opened swadeshi markets and door to door sale of swadeshi goods. Women of Tamil Nadu both literate as well as illiterate extended their support by attending Home Rule meeting, offering prayers for the success of the Home Rule Movement.¹⁶ In rural women, affectionately called Mrs. Besant as *Allcotti Duraisani*. Among the women members, the most important one in Madras was N. Sivakami Ammal, who took an active interest in women's education. She requested Mrs. Besant to conduct a seminar on the topic 'The Duties of women towards Home Rule and Swadeshi Movement' in the Congress session held at Karachi in 1917, and also sent a representation to Mrs. Besant supported by 2000 women. Influenced by N. Sivakami Ammal, the Congress session of that year was attended by a large number of women. One of them was so influenced by the scheme of Mrs. Besant celebrated the National Education Week, it was attended by a large number of women. One of them was so influenced by the scheme of Mrs. Besant that 'she donated her jewellery worth about Rs. 6,000 for the cause of national education'.¹⁷

The Government of Madras Presidency alarmed over the political awareness created by this League leading to an unstable condition during the First World War. The government made it clear that the Theosophical Lodges were being used as the centres of the local agitation for Home Rule by her followers in many places, and even that Mrs. Besant advised her followers to join the Home Rule Movement. The government, fully realizing the danger behind her political activities, prohibited Mrs. Besant from attending any political meetings or speaking or publishing anything by an order. Lord Pentland, the Governor declared that her attendance would be "prejudicial to the public Safety".¹⁸ In another report, the Theosophical

Society had been hailed as one of the agents in the Revival of Hindiusm.¹⁹

Most of her ideas about Home Rule made initial appearance in *New India*. It also covered several incidents and themes relating to home rule. Her writings influenced the masses positively and the government negatively. The enraged government turned against the paper. The articles made it clear that the Government was following the same old policies of former statesmen like Macaulay, Chamberlain and Curzon. Now the Government decided to destroy the power of this paper, because the movement naturally became a headache to the bureaucracy. Meanwhile, the government of Madras Presidency decided on 15 August 1916 after consulting the Advocate General and the public prosecutor to take steps under section 4 of the Indian Press Act, 1910 for the forfeiture of the security which she was required to deposit in her capacity as keeper of the Printing Press at which *New India* was published. In this regards Mrs. Besant claimed that it was a nationalist press and hence it was supporting nationalist demands.²⁰ In one of her articles, she stated that the fate of the British empire hangs on the India and therefore it is but wisdom and precedence to keep India contented by granting Home Rule to her. She also wrote that India was a tremendous reservoir of man power far greater than America and Home Rule India was an asset to the empire in the struggle against German militarism in the wake of the first World War.²¹

In the meeting Mrs. Besant had with His Excellency the Governor, on 16 June 1917, the latter said that the Government had planned to put a stop to all her activities. In answer Mrs. Besant said: "You have all the power and I am helpless and you must do what you like. There is just one thing I should like to say to your Excellency and that is that, I believe you are striking the deadliest blow against the British Empire in India. You will pardon my saying to your Excellency that, as you are acting as the Governor, I have no personal feeling against Your Excellency".²² The Governor asked Mrs. Besant whether she had any proposals to make. In answer she said that she had nothing to withdraw or explain.

His Excellency gave her time to consider, to which she said it was not necessary and she asked leave to withdraw.²³ Thus, the interview ended in failure. The much anticipated Government order to intern Mrs. Besant and her two associates Mrs. Arundale and Mr. Wadia, was served on 16 June 1917. The notice asked Mrs. Besant to select one of the six places mentioned, where she should live in internment. Mrs. Besant chose Ootacamund in the Nilgiri District, and the Government agreed. During her stay there at Ooty, her health deteriorated much. Later on the suggestion of Government, she was shifted to Coimbatore.²⁴ The entire Coimbatore soon became the centre of special Home Rule activity.

In the South, protests carried for Mrs. Besant's release. In Tamil Nadu, protest meetings were held everywhere. The Moderate Congressmen were involved and participated in Home Rule agitations. It was an open secret that Mrs. Besant despite governmental surveillance, was freely writing to her paper, *New India* which created further stimulus. Mr. H. Baillie Weaver, the General Secretary of the Society in England protested the misrule of the government in India. He continued to bring all possible pressure to bear upon the British government to have the internment order reversed.²⁵ The representatives of the Indian National Congress and Muslim League met at a joint conference in Bombay on 28 and 29 July, 1917. In the conference, a resolution was insisting the government to revoke the internment order. The Madras Provincial Congress Committee approved the Resolution of the joint conference on 14 August 1917 that the unjust and unconstitutional orders of internment must be annulled.²⁶

At Gandhi's instance, Shankerlal Banker and Jamnadas Dwarkadas collected signatures of one thousand men willing to defy the internment orders and march to Besant's place of detention.²⁷ C.P. Ramaswamy Iyer was devoting his talents to work of Home Rule Movement toured most of the cities in Tamil Nadu such as Salem, Kanchipuram, Vandavasi, Madurai and Ramnad and delivered speeches demanding to release of Mrs. Besant. Jinnah joined in Home

Rule Movement.²⁸ Many prominent leaders such as S. SubramaniyaIyer, Justices SadasivamIyer, A. RangasamyIyer voiced against the policy of repression of the government and they demanded the release of the arrested.

S. SubramaniyaIyer wrote a letter to President Wilson of United States, America asking him to stress on the release of Mrs. Besant. Madras government took it seriously and considered the letter as objectionable and seditious. Consequently, he renounced his knighthood. The women of Tamil Nadu including Mrs. JinarajaDasa indulged in different sorts of protest demanding the

release.²⁹ Besides, in rural areas, prayers were offered. Newspapers including Swadeshimithran, Desabaktan, Deshabimani expressed their view that the suppression would not subside the spirit of Nationalism. Despite suppression, the calculation of the government failed as the agitations increased with intensity. The Home Rule Movement, yielded its desired result. Annie Besant was released.³⁰ In addition, Montague, the Secretary of State, came to India in November 1917. Montague Chelmsford report came into effect from 1919 which stressed over the self-government.

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THE IMPACT OF FOOD QUALITY ON CUSTOMER SATISFACTION IN FINE DINING RESTAURANT: A STUDY OF CHANDIGARH: THE CITY BEAUTIFUL

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ABSTRACT

Food quality is acknowledged as the key component in restaurant customer's satisfaction. The aim of this study was to investigate the impact of food quality towards customer satisfaction in fine dining restaurants along with the understanding of relationship between food quality and customer satisfaction. A questionnaire-based survey was distributed to 92 customers who visited fine dining restaurants in the city of Chandigarh and data was collected through convenience sampling. Results specify that food quality significantly affects customer satisfaction. Further the study also exhibits that presentation of the food and taste are the most substantial aspects towards customer satisfaction in fine dining restaurants. The study found that the fine dining restaurant meant for exhibiting best of service and food quality must focus on visual presentation and taste of food for success in business in the long run.

Keywords: Food quality, fine dining, customer satisfaction

Introduction:

Hospitality industry always strives to achieve customer satisfaction and make long-lasting relations with their customers. The most important element for the success in hospitality service is improved customer satisfaction and meeting with their demands (Kim et al., 2009).

Literature reveals that there is a strong relationship between the quality and customer satisfaction. Various studies have been carried out to investigate the impact of service quality offered in restaurants on customer satisfaction and their experience (Kanta and Srivalli, 2014; Rahman et al., 2012; Saglik et al., 2014; Tat et al., 2011). Customer satisfaction is an evaluation of product or service that starts after the consumption of the same by the user (Yuksel & Rimmington, 1998). The study supports the after consumption evaluation and is meant to explore the food quality elements that creates satisfaction among the customers of fine dining restaurant.

The present study is about the impact of food quality on the customers dining in fine dining restaurants of Chandigarh, also known as 'The City Beautiful', planned by the famous French Architect, Le Corbusier. It is one of the most modern cities of India having diverse range of food outlets all across serving mouth watering delicacies. The city is

having a wide variety of fine dining restaurants serving American, European and Asian cuisines (Chandigarh tourism.gov.in).

Although a substantial literature has evolved in this area, and there are plenty of studies done on service quality and customer satisfaction in hotels and restaurants that explored satisfaction in terms of service delivery, expectations and perceptions of the customers (SERVQUAL framework developed by Parasuraman et al. in 1988) along with the dining atmosphere and quality viewed by customers in a restaurant (DINESERV model by Stevens et al., 1995) but relatively less of the research has been done which relates to the actual food quality elements that customers experience or come across leading to their satisfaction or dissatisfaction especially in fine dining restaurants. This led to conceive an idea for conducting research in the area of food quality and customer satisfaction in fine dining restaurants of Chandigarh by taking note on the elements of food quality like visual appeal, taste, variety, healthy options and the temperature along with the overall view of the dining service quality.

Literature review:

Customer Satisfaction

Customer satisfaction has long been accepted by the service organisations as an important variable which contributes to the

overall market share and return on the investments. The literature suggests many definitions and satisfaction models applied by various researchers. The satisfaction and dissatisfaction of the customer is based upon the theory of disconfirmation that denotes “the customer feels satisfied if the performance of the product/service offering is as per their expectations or more than what was expected (confirmation) and feels dissatisfied if the product/service offering does not match the expectations (disconfirmation)” (Oliver, 1980).

According to Zairi (2000) the feeling of joy and contentment of expectation is known as Satisfaction. No matter what organisation it is, customer satisfaction is the most critical element and also taken as most valuable in terms of growth and success of any business (T. W., 2001). Customer satisfaction can be defined as an overall evaluation of a product or service relying on its purchase and consumption over a period of time by the users (Fornell, Johnson, Anderson, Cha & Bryant 1996). A satisfied customer would purchase frequently and will also recommend to others for purchase whereas the growth and success of an organisation is at risk when the needs of the customer are overlooked by them (Tao 2014.) It has been observed that a dissatisfied customer often turns into a complainant and asks for the compensation because of the inconvenience due to a failure in consumption experience (Oliver, 1987; Nyer, 1999). Word of mouth remains a strong tool for the success of any service organisation, the positivity will enhance promotion of relationship between the service provider and the customer which further aids in the process of building brand image in the society (Day, 1977). Hence, the service provider must take this into account seriously otherwise the testy customer may even spread a negative word of mouth in the public which may lead to loss of brand image and identity in the market.

Food quality

Customer satisfaction in restaurant business is achieved through quality of food offered which in turns satisfies the needs and expectations of the customers (Peri, 2006). Ng

(2005) is of the view that food quality elements (taste, freshness and eye appeal) play an important role in attaining or exceeding customer satisfaction as compared to other elements such as price, value, convenience and hygiene. Recognising the impact of food quality in the restaurant business many researchers have examined different attributes of food quality. Sensory elements like temperature of food, presentation, nutrition, freshness, hygienic and variety in the menu have been emphasised during research on food quality. Food temperature intends to augment in the food experience of the customers (Kahkonen et.al, 1995). Taste of the food is another quality element in dining due to the keen interest of the customers (Cortese, 2003 & Kivela et al., 1999)

Customer loyalty towards a restaurant is dependent upon the food quality which remains a crucial point in the entire dining process (Namkung and Jang, 2007; Clark and Wood, 1999). The quality of food served determines the perception of the customer to visit a restaurant (Susskind and Chan, 2000). Food quality is gauged by the variety in the menu, presentation technique, health benefits, taste and temperature at which the food is served (Namkung and Jang, 2007). According to Ko and Su, 2015, the important elements concerning food quality service are classified into two different categories, first is associated with the customer and the second is the product offered to them. The customer category includes physical environment, service quality and promotion whereas the product category includes hygiene, food safety, gastronomic art and the food characteristics. Studies indicate that satisfaction with the quality of food offered is the key prognosticator of the customers revisit intention in a restaurant (Oh, 2000; Qu, 1997; Pettijohn, Pettijohn, & Luke, 1997). According to Brown (2004), the food quality features are elucidated in terms of the sensory characteristics of the food which are colour, flavour, taste, texture and the temperature at which food is served to the customers. Ryu et al. (2012) highlights food quality as the major determinant of restaurant success and adopted five dimensions of food quality: the alluring

smell of the food, variety in the food offerings, nutritional aspect, taste and freshness of the food. A study by Auty (1992) states that the choice of a restaurant for a customer depends upon the type of meal, quality of food and value for money it provides in return and it varies according to the occasion.

Fine dining restaurant:

Fine dining restaurant concept is associated with the traditional classic French dining where a great emphasis is on the menu and the service provided to the customers (Rush; 2006). As such there is no established definition for the fine dining restaurant as it may vary as per the individual characteristics. The literature suggests it as a full service dining outlet which provides gourmet food and immaculate service at a premium price. Experts believe that a fine dine restaurant must have good surroundings, fine cutlery and crockery and also an exquisite service provision to make dinner a memorable event for the customers (Schneider, 2007, as cited in Harden, 2007).

Ko King Lily Harr (2008) has identified few key aspects of a fine dining restaurant which states that a fine dining restaurant must serve quality food with great eye appeal effect, usage of fresh and quality ingredients, exceptional taste, impeccable service with state of the art tableware, showcasing culinary skills, dress code for customers and staff along with perfect ambience for the diners.

Methodology

Sampling and questionnaire

The study was undertaken in fine dining restaurants of Chandigarh selected randomly as per their popularity and having nice and comfortable settings. The respondents were targeted on convenient basis through non-probability sampling. Self-administered questionnaire was developed with closed ended questions. Sample population included 100 customers dining in 10 different purposively selected fine dine restaurants. Quantitative research method was adopted to empirically determine the relationship of food quality elements and customer satisfaction in fine dining restaurant.

Survey for the study was conducted in three parts. First part of the survey focussed on the demographic profile of the respondents related to gender, age, education level and monthly income. Second part included 6 items measuring food quality elements adapted from previous studies in the restaurant service sector (Johns & Tyas, 1996; Kivela et.al, 1999; Raajpoot, 2002; Stevens et.al., 1995). Perception about food quality elements was measured using seven point Likert scale ranging from (1) Completely disagree to (7) completely agree. Third part of the survey included 4 items measuring satisfaction of the customers in fine dining restaurant with a seven point Likert scale. According to Edvardsson (2005), customers have better perceptions about the service quality during the production, delivery and consumption process of products and service offerings. In view of the above statement, after getting approval from customers and the restaurant management, customers who had finished their meals in the restaurant were approached for the survey

Data collection

A pre-test of 25 questionnaires was conducted at two different fine dining restaurants prior to the actual data collection in order to gauge the survey instrument (Cooper & Schindler, 2006). This allowed the researcher to obtain feedback from respondents regarding the accuracy and explicitness of the questions as well as the reliability of the scale used. Considerable modifications based on the feedback were done after the pilot test.

The survey was completed within five weeks time by collecting responses from the customers in the presence of the researcher. Out of the total number of respondents only 92 customers participated and shared their views in the study. Separate reliability test was conducted for the second and third part of the questionnaire and it was observed that the items used were reliable with coefficient alpha value at 0.812 and 0.852 for both sections.

Results

Profile of the respondents

Out of 92 respondents, 54% were male and 46% were females. Majority of the respondents were between the age group of 41-60 (45.6%). In respect of marital status 68.2% were married. About 42% of the respondents were working in private sector. Income of the respondents was between Rs.6000-7000. Results show that the respondents usually experience fine dining food twice in a month (42.1%).

Food quality elements toward customer satisfaction in fine dining restaurant

Descriptive statistics were used to explore the influence of food quality towards customer satisfaction by calculating the mean

scores for all items as shown in Table: 1. Based on the results, the mean score ranging from 5.51 to 5.68 respectively, implies that the customers at the fine dine restaurant were satisfied with food quality and agreed with its elements concerning food presentation, variety in the menu, nutritional aspect, taste, flavour, freshness and temperature at which food was served. These results ensure quality and its acceptance by the customers of fine dining restaurant. Moving on to Table no: 2 for customer satisfaction, the results of the mean scores shows values from 5.52 to 5.59 which implies that most of the customers agreed to their satisfaction and appreciates the service quality and exceptional dining experience

TABLE 1

Mean score of food quality elements towards customer satisfaction

Sr. No.	ITEMS	Mean	Standard deviation
1	Food served is eye appealing	5.68	.927
2	Restaurant is offering variety in their menu	5.51	1.001
3	Menu offers healthy options to choose from	5.53	.1.003
4	Food served is good in taste and flavour	5.67	.921
5	Food served in restaurant is made by using fresh ingredients	5.65	.923
6	Restaurant serves food at preferred temperature	5.64	.939

n=92

TABLE 2

Mean score of customer satisfaction

Sr. No.	ITEMS	Mean	Standard deviation
1	The service delivery is quick and accurate	5.52	.902
2	I am happy to visit the fine dining restaurant and would visit again	5.55	.942
3	Service personnel are courteous in the fine dining restaurant	5.57	.950
4	Overall I am satisfied with the dining experience and the service of the restaurant	5.59	.958

n=92

The relationship between food quality elements and customer satisfaction

Multiple regression analysis was used to assess the relationship between food

quality elements and the overall satisfaction of the customers in fine dining restaurant. Results from the Table 3 shows that food quality elements ($\beta=0.708$) were significantly affected customer satisfaction ($p=0.00$). This

TABLE 3

Multiple regression analysis of food quality elements and customer satisfaction

R	R square	Standard Coefficient Beta	t	Sig.
.708a	.503	.708	8.931	.000

a. Predictors: (Constant), FOODQUALITY

b. Dependent Variable: Customer Satisfaction

Most substantial elements of food quality towards Customer Satisfaction in Fine Dining Restaurant

A simple linear multiple regression was conducted to determine the impact of food quality elements towards customer satisfaction in fine dining restaurant. Result from the Table 4 shows the Beta coefficients indicated that presentation of the food had a significant impact influencing overall

TABLE 4

Analysis of the most substantial elements of food quality towards Customer Satisfaction in Fine Dining Restaurant

Model	Standardized Coefficients Beta	t	Sig.
(Constant)		2.168	.033
Food presentation	.403	3.383	.001
Menu variety	.093	.854	.398
Healthy	.025	.208	.837
Taste of the food	.238	2.060	.045
Freshness of ingredients	.085	.809	.423
Temperature of the food	.065	.598	.552
R Square =	0.538		

a. Dependent variable: Customer satisfaction

Discussion

The study observed the impact of food quality elements over customer satisfaction in fine dine restaurants of Chandigarh and is identical to the study undertaken by Ray

study shows that the value which is R Square for food quality elements towards customer satisfaction 50.3%. This is presented as an acceptable result.

customer satisfaction ($\beta=.403$) and followed by taste of the food ($\beta=.238$). In other words, visual presentation of food has a great impact on the overall satisfaction of customers in the fine dining restaurant. The results indicated that the regression model fits the data well. About 53.8% variance in overall customer satisfaction was explained by food quality elements satisfaction.

2015, which states that the visual appeal of the food always creates a ‘wow’ factor for the customers in terms of having a good first impression related to their satisfaction in a restaurant. When it comes to food, it is

always accepted that presentation comes before the taste or we eat with our eyes first (Spence et al. 2016).

The results indicates that the customers were completely satisfied with the quality and service experience at the fine dining restaurant and it calls for managers to offer more improved quality and services to the customers in fine dining restaurants which in turn will enhance revisit and revenue generation.

The results of the analysis states that most of the customers observed food presentation and taste of the food as the essential food quality elements for their satisfaction in a fine dining restaurant which is similarly emphasised in the book on culinary fundamentals by Labensky et al. 2014. Another study explains food presentation as a trend nowadays creating astounding experience for the customers (Dhetira, 2016). Food presentation remained the most preferred quality element for satisfaction by the customers in fine dining restaurant which supports the study of Stewart & Goss (2013) which specifies that the visual display of food in a platter determines the perception in the assessment of food quality served to the customer.

The second food quality element which has a most significant impact on customer satisfaction is the taste of the food offered in the fine dining restaurant. Results of the study revealed that taste and presentation of the food remains a dominant aspect in customer satisfaction and is found to be similar to the investigation on food quality and customer satisfaction done by Namkung and Jang (2007) and also supports Ko King Lily Harr (2008) fine dining restaurant key

aspects of quality. The restaurant may present all food and service quality elements well but if there is a slight compromise on taste of the food, the customer will not accept and consider the overall experience as bad or of low quality which further leads to impact the future behavioural intentions (Kivela et al. 1999). Fine dining restaurants must pay utmost attention on consistently improving the taste of the food for the overall satisfaction of the customers.

Conclusion:

As a conclusion this study has showed that food quality elements significantly impact the customer satisfaction in fine dining restaurant along with providing overall satisfaction to the customers. It also indicated that visual presentation of the food served to the customers creates a feeling of satisfaction in terms of food quality and the customers in the fine dining restaurant appreciate taste of the food as another aspect of their satisfaction. In addition the customers in this study were satisfied with the overall service and their dining experience with the fine dining restaurant. In similarity to all other empirical studies the present study also has some limitations. Firstly, it could not be generalised to the entire population of Chandigarh because the study was conducted only in selected areas of the city and that too in fine dining restaurants. Hence, in future, it is suggested that the researcher should focus on other geographical regions with a larger sample size. Secondly, this study used convenience sampling in which respondents are not specific. Therefore in future studies other methods of sampling may be used to collect relevant data and also from other types of restaurants.

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IMPACT ANALYSIS OF ISLAND EROSION ON LIVELIHOOD IN GHORAMARA**Ina Dhar Roy Dasgupta¹, Tapati Banerjee Bhadra², Atanu Saha³**¹Department of Geography, Shahid Matangini Hazra Government College for Women, inadharroy@gmail.com²Department of Rural Development Studies, University of Kalyani, tapatibanerjeebhadra@gmail.com³School of Languages and Linguistics, Jadavpur University, atanu.saha@jadavpuruniversity.in**ABSTRACT**

The paper is an attempt to study the land use pattern and the impact of riverine erosion in the Sagar Island of West Bengal. The survey conducted during the fieldwork shows the large scale uprooting of families due to the loss of land. Apart from the loss of a job, search for better education has also led to forced migration. The study concludes that there is a dearth of disaster management and mitigation system at Sagar Island.

Keywords: Erosion, Livelihood, Socio-Economic Changes, Migration, Disaster Management

1 INTRODUCTION

This paper attempts to explicate the impact of land erosion on the livelihood of the inhabitants of Ghoramara Island. The island of Ghoramara, located in the southern part of South Twenty Four Parganas of West Bengal, is getting highly affected by the riverine erosion. We argue that the size is shrinking at a very fast rate by comparing the land use from 1954-2018. The *Ghoramara, Lohachhara, Suparibhanga, Agunmari* and Bedford islands were part of Sagar Island till 1904. But due to river erosion, these islands got separated from Sagar. People were displaced from Lohachhara Island due to its submergence and 374 inhabitants were rehabilitated by the Government (Ghosh A. , 2018). In the Ghoramara island, no such deposition took place and erosion dominated in all directions from 1951 to 2011 (Chakraborty, 2013). The geomorphological changes observed in Ghoramara are largely the result of changes in estuarine hydrodynamics and a rising sea level. Studies show that a tectonic tilt pushed the Ganges eastward leading to a drastic reduction in the freshwater inflow into the estuary, causing an imbalance in its natural settings. The major villages within the Ghoramara Island are 1) *Khasimara*, 2) *Khasimara Char*, 3) *Lakshminarayanpur*, 4) *Bagpara*, 5) *Baishnabpara*, 6) *Hatkhol*, 7) *Raipara*, 8) *Mandirtala* and 9) *Chunpuri* of which first five villages are already partly

under the water (Jana, Shamina, & Biswas, 2012), (Ghosh & Sengupta, Morphological Changes of Ghoramara Island, West Bengal: documentation, 1997), (Ghosh, Bhandari, & Hazra, Application of a Bioengineering technique to protect Ghoramara Island (Bay of Bengal) from severe Erosion, 2003).

In 1996, a significant number of families of Ghoramara were rehabilitated to Sagar Island. At present, the process of resettlement of the displaced people of Ghoramara has stopped. However, the flow of inter-Island migration and seasonal migration from Ghoramara continues as a consequence of land loss. Some inhabitants are shifting from one place to another within their island and some people are moving to other islands or towards the mainland. This movement has caused large scale changes in their natural lifestyle and affected the livelihood, socio-economic characteristics, security and all such related issues of the inhabitants of Ghoramara. People from this island are mainly engaged in agriculture and fishing. However, these livelihoods are threatened by these present changes (Hajra, Mortreux, & Ghosh, 2017). There is no scope for the development of secondary and tertiary activities due to lack of infrastructure (Mondal, 2015) on the island.

The present paper is an attempt to identify the overall impact of such changes in this

island with special reference to its demography, economy and education.

The major objectives of the present paper are-

- To formulate a detailed account of the river erosion and land loss
- To demarcate the land-use change due to erosion
- To highlight the characteristics of the present socio-economic status of the island people concerning occupational shift and the pattern of migration
- To prepare a detailed account of the government initiatives including

Rehabilitation, constructional measures, amount and types of compensation etc.

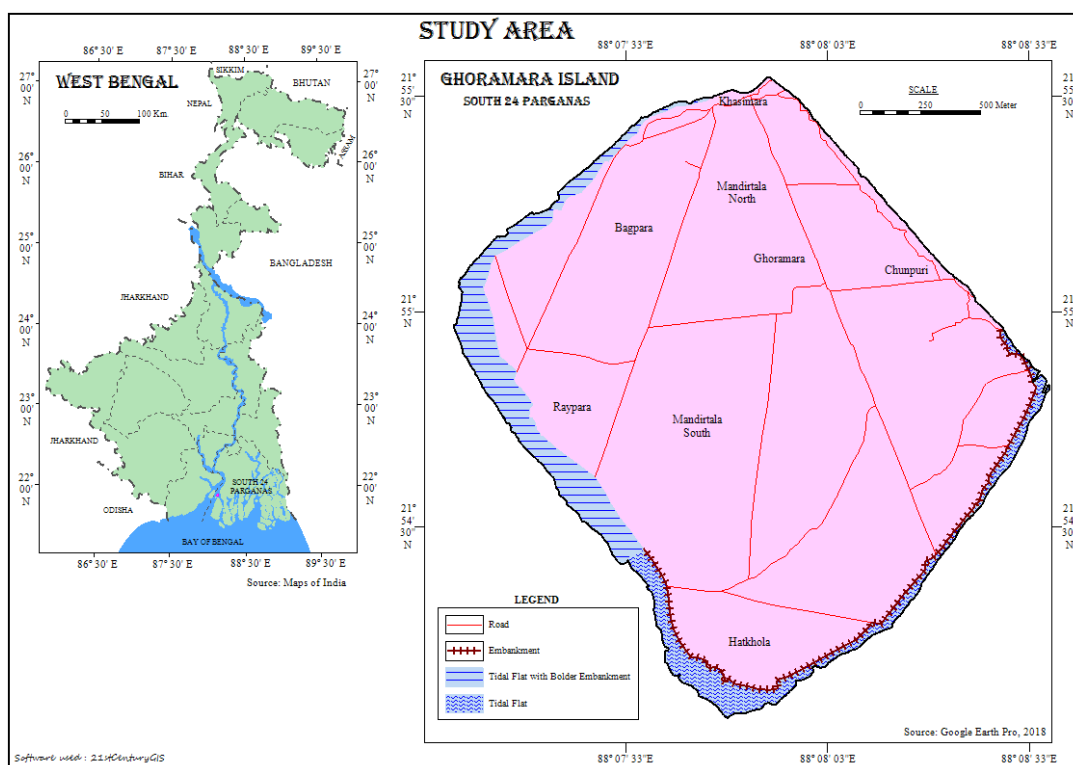
- To suggest remedial measures to combat such a disaster.

1.1 STUDY AREA

Background

The island of Ghoramara is located at $21^{\circ}53'56''$ N to $21^{\circ}55'37''$ N and $88^{\circ}06'59''$ E to $88^{\circ}08'35''$ E situated at the western part of the active deltaic area under the jurisdiction of Sagar block, South Twenty Four Parganas, West Bengal (map number 1).

Map No. 1



The name Ghoramarahas originated from *ghora* 'the word for horse in Bangla' which was killed by a Royal Bengal Tiger during the British period when it was under a dense forest cover. At present, the island area has reduced to 3.83 sq. km due to river erosion (Google earth Pro 2018) which was 18.54 sq. km during 1954 as per the Topographical Map Sheet number NF 45-11 series U502, 1954. According to (Chakraborty, 2013) it shrunk to 13.41 sq. km during 1973. It became 6.67 sq. km in 1990 and 4.37 sq. km during 2011.

At present, in Ghoramarathe total population is 5193 which was 5236 in 2001 and was 4163 during 1971. It shows that the natural growth of the population has reduced in the last ten years (2001-2011).

In the next section, we have discussed the methodology of data collection and the main findings.

1.2 METHODOLOGY

The study is primarily based on primary data which includes extensive fieldwork in the Ghoramara Island. A hundred sample households (10% of the total households)

were surveyed based on a questionnaire among the total of 1095 households. Samples are selected using the Purposive Random Sampling Method based on area i.e. the island comprises of seven 'para' or localities and the households have been selected from each 'para' or locality on a random basis. The localities are known as *Khasimara*, *Mandirtala North*, *Mandirtala south*, *Chunpuri*, *Hatkhola*, *Bagpara*, and *Raypara*. The secondary data has been collected from the Ghoramara Panchayat Office and the Land Records Department of Sagar Block.

2 LOSS OF LAND

Though the data regarding the loss of land in Ghoramara varies in different research papers and documents, it can be argued that the island has lost around half of its area only within a period of 35 years (1975 – 2010). Now based on the surveyed population a table has been prepared to show the loss of land at a personal level. Consider the data given in Table No. 1.

Table 1 Loss of land

Amount of land in a Bigha (Approx. 1337.8907sq. m)	Percentage of the surveyed household
No loss	25.55
Less than 2	12.22
2 to 5	20
6 to 10	16.67
11 to 20	2.22
21 to 30	1.12
31 to 50	4.45
51 to 100	9.88
More than 100	7.89

Some significant observations were made during the survey regarding the loss of land:

1. The inhabitants reported having no loss of land are mainly the residents of the core area of the island and it is primarily the northern part of *Mandirtala*.
2. *Khasimara* was affected by land loss on a large scale. *Raypara* is also affected highly. The inhabitants of *Khasimara* have moved to three places.
 - a. Rehabilitated to Sagar Island
 - b. Migrated to *Kakdwip* and other areas.
 - c. Shifted to other safer areas of Ghoramara Island mainly to

Mandirtala, *Chunpuri* and *Bagpara*.

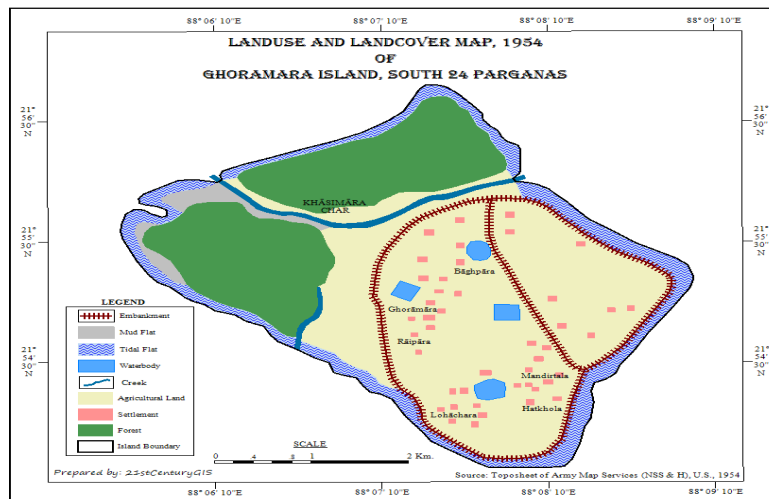
3. *South Mandirtala* was also affected whereas the north remained safe mostly.
4. *Chunpuri* also belongs to the highly affected zone.

3 IMPACT OF LAND LOSS

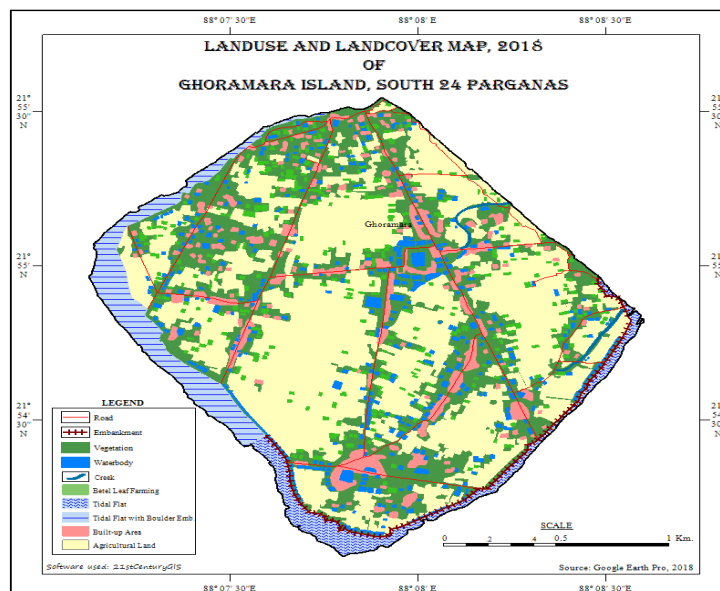
3.1 CHANGES IN LAND USE PATTERN

Consider (Map No. 2 and 3) which show the changes in terms of land use pattern of Ghoramara from 1954 to 2018. A comparative study between the two maps shows significant changes in land use pattern.

Map No. 2



Map No. 3



The maps reflect Agricultural Land has reduced from 10.12 sq. km to 1.77 sq. Km i.e. almost one-tenth of its earlier area. This fact must have affected the total economy of the island. Betel leaf farming has become significant in recent times and it has been corroborated by interviewing the people of the island. The built-up area remains almost the same with a slight increase of 0.04 sq. km. It may be assumed that the slight increase is due to the new houses and schools etc. Waterbody has reduced from 0.26 sq. km. to 0.15 sq. km. People have complained about the submergence of ponds due to river erosion. The tidal flat has also reduced from 2.59 sq. km. to

0.37 sq. km. During 1954 around 5.05 sq. km. area was under the forest cover which is no longer visible in the new map. However, there is 1.09 sq. km. area within the island covered with natural vegetation including some plantation by the villagers. Many new roads have been constructed within the island, some are purely dirt and some are semi dirt in nature. Due to heavy tidal erosion, a new boulder embankment has been constructed in the western periphery of the island. There are many families who have lost their houses and now living in others' houses by paying rent.

Table No. 2 below shows the areal changes in the land-use pattern from

1954 to 2018. It highlights that during 1954, 54.27 % area was under agriculture which has now become 46.21%. The forest cover

occupied 27.08% of the total area during 1954 which is now under the water and the area under vegetation is 28.72% at present.

Table 2 land use Pattern of Ghoramara

Land use	1954		2018	
	The area in Sq. Km.	Percentage of the total area	The area in Sq. Km.	Percentage of the total area
Agricultural Land	10.12	54.27	1.77	46.21
Built-up area	0.26	1.39	0.30	7.83
Tidal Flat	2.59	13.89	0.37	9.66
Water Body	0.26	1.39	0.15	3.92
Betel Leaf Farming	Nil	Nil	0.14	3.66
Forest	5.05	27.08	Nil	Nil
Vegetation including plantation	Nil	Nil	1.10	28.72
Mudflat	0.37	1.98	Nil	Nil
Total	18.65	100	3.83	100

Source: Calculated from Map No.2 and 3

3.2 IMPACT ON THE DEMOGRAPHIC STRUCTURE

3.2.1 MIGRATION

The river erosion has upset the lives of the local people of Ghoramara in various ways. Due to the loss of houses and lack of a job, people are migrating from the island to other areas. Two types of migration have been found during the study.

1. Job-Related- A significant number of people are going to other states and also to different parts of West Bengal for employment. They generally move to these areas for a short period and come back to the island after some month. This can be termed as seasonal migration. Most of the people go to different places in Kerala and Mumbai for jobs and a significant number to Kolkata. Few of the emigrants from the island also go to other places such as Assam, Bangalore, and Tamilnadu etc.

In most of the cases, the male member of the family migrates to these areas, but there are instances where both the husband and the wife have moved out.

2. Migration of homeless people
Due to the river erosion people losing their houses on this island, particularly near the river bank. These people are shifting their houses to other areas. This type of migration can be categorized into two further types.
 - i) Within island shifting
A group of people are moving towards the interior parts of the island from the riverside areas. This is a continuous process and there are many families those have shifted three times or more than that.
 - ii) Outside island shifting
The movement of people to other areas is happening outside *Ghoramara* due to loss of land, house, property etc. There are two groups of people belonging to this category.

- a. A section of the population who wererelocated in different parts of SagarIsland by the Govt. of West Bengal.
- b. People who have purchased land on their own and constructed new houses to other areas particularly *Namkhana, Kakdwip, and Budakhali* and even to the peripheral areas of Kolkata like Sonarpur-Baruipur. Most of them have shifted permanently and sometimes visit *Ghoramara* to meet their relatives. Few families come to *Ghoramara* to look after their agricultural land, fishing etc. Sometimes only the male member comes here and occasionally with the family. During this period, the students attend the local schools.

3.2.2 AGE-SEX STRUCTURE

Even though migration from the area is a continuous phenomenon, the gender and age distribution of studied population represents that the population of working age group (15-48 years) is still struggling to earn their livelihood on this island. They consist of about 61 percent of the studied population.

The village represents a considerably low female population in several age groups especially in 6-14 where the ratio is 29:19, in 15-24, it is 65:43, and among 37-48 the ratio is 41:28. These gender-selective migrations can affect social and economic variables in the destination and source regions in many ways (Tumbe, 2014). Interestingly, the trend of migration as revealed during the field study shows a reverse trend. Generally, most of the migrations are heavily male-dominated, particularly when livelihood is concerned. It became evident that a large portion of male members of working age groups is still residing in the area despite the continuous threat of losing the cultivable land and loss of work. The other family members have shifted to nearby urban centres and even to the suburbs of Kolkata. The study visibly exposed that most of the residents of the younger age group shifted towards other places either individually or with their family members leaving the old ones in search of secured places and search of alternative source of occupation. During the study,

several households even reported that the families of the girls of the nearby areas are not interested to see their girls getting married to the boys of the same village due to the receding nature of agricultural and homestead land.

3.2.3 EDUCATION

The loss of land in Ghoramara and a regular flow of migration to other areas have troubled the educational scenario of the island. The education status of the area reflects the uncertainty which is the most common problem of the island at present. More than one-third (37%) of the aged male household heads are illiterate. About 19% of the total population is educated till the primary level and 41% of them left school before attaining class IX. These people had to engage themselves in earning their livelihoods. Only 18% have completed secondary education, just 2% completed Higher Secondary level and another 2% are found to be graduates.

Around 25.42% of females are illiterate compared to the percentage of the male which is 16.03%. There are 3.39% of male and female populations those have studied more than Higher Secondary level.

Accessibility to higher education is still a difficult chore for the residents of Ghoramara. Several reasons demonstrate the unwillingness to acquire education including the factors like a continuous threat for loss of homestead land, poverty and distance from the colleges and higher educational institutes, unavailability of regular public transport and insecurity of the labour market. The educational status of the family members of the studied households shows a marginal trend to attain a higher educational qualification despite all odds.

There are eight primary, one Junior High and a high school, all run by the government on the island. During the survey to these schools, it became clear that schools are also getting affected due to erosion and land loss. Raypara Junior Basic School has shifted thrice due to the loss of school area because of the river encroachment. Both the Junior High and High school buildings are in bad shape and need urgent repairing and extension in many places. *Ghoramara Milan*

Vidyapith was also affected by riverbank erosion thrice and the old building is abandoned now.

Another major problem the schools are facing at present is the irregularity of their students. Around 20% of the total students are irregular in *KhasimaraNimnobuniyadiVidyalaya*. There are a significant number of families in Ghoramara who live in two places, sometimes in Ghoramara and sometimes outside the island. They have arranged for an alternative residence due to the fear of land loss in future. Thus the school students of these families attend classes on a very irregular basis. As a consequence, teachers get demoralized due to large scale dropouts and the reluctance of the administration for the upgradation of these schools. Moreover, an increasing tendency of developing parallel teaching system or private coaching classes aggravates the problem. A large section of the studied households expressed their incapability to bear the cost allied with

education like private tuition, communication etc. as their livelihoods are at stake due to the unfavourable condition of the island. In this context, we argue that seeking a better option for education has led to the migration of the island people, if not, due to the loss of occupation and lack of cultivable land alone.

3.3 OCCUPATION

The arduous life of the island always makes the living difficult as a lone source of income hardly proved to be sufficient for the residents of the island. The saline land does not provide scope for a wide variety of agricultural produce which could become a steady source of income throughout the year. The wrecked condition of river embankment often causes a problem for their agricultural activity. Ironically, the construction work of embankments also provides a scope for their earnings both for the head of the households as well as for the other members.

A table (No.3) is prepared based on the surveyed data shows that most of the people are working as wage labourers.

Table 3 Occupational scenario of the studied households

Occupation	Frequency	Percentage
Wage Labour	63	36.42
Fishing	23	13.29
100 days' work	21	12.14
Fishing net production	9	5.20
Mason	8	4.62
Tuition	6	3.47
Trading and Business	6	3.47
Agriculture	6	3.47
Beetle leaves Cultivation	7	4.05
Unemployed	7	4.05
Others	17	9.82
Total	173	100

Source: Field Survey

A section of the population follows the traditional occupation whereas a diverse range of the activities of the people in the

study area has been noted. Some of the youths have chosen private tuition or working at fishing trawlers and boats as their

occupation. A growing trend of working as a mason and as their helpers has also been observed.

Income Distribution

It has been found that most of the households have varied source of income but the unstable income along with unsuitable terrain condition force them to move from the land.

The monthly income of the majority (52%) of the families is within 5000 to 10000 INR and 28 of them earn below 2000 INR per month.

Only eighteen families earn 10000 INR and above.

3.3.1 OCCUPATIONAL CHANGES

The most important impact of river erosion in Ghoramara is the occupational shift of the local people. The data collected from the field survey is arranged in the following table (Table No 11). Though many people have shifted to a new occupation from their earlier one, there are some people engaged in the older occupation.

Table 4 Trend of Occupational Shift among the surveyed population

1.	Agriculture to the daily labourer	32.54
2.	Agriculture to sea fishing	6.60
3.	Agriculture to Boat Driver	1.18
3.	Agriculture to Mason	8.88
4.	Agriculture to 100 days work	14.8
5.	Agriculture to Jewelry work	1.16
6.	Agriculture to Business	2.36
7.	Agriculture to Service	4.72
8.	Fishing to Maid	2.96
9.	Fishing to Daily labourer	1.78
BECOMES JOBLESS		2.36
NO CHANGE		
	Service	0.58
	Business	0.58
	Sea Fishing	2.36
	Mason	0.58
	Agriculture	3.56
	Daily Labourer	8.28
OTHER NEW OCCUPATION		
	Tuition	2.36
	Fishing Net Making	2.36

Source: Field Survey

Ghoramara was basically an agriculture-based island in past. But due to the river erosion, the livelihood pattern of the local people has changed sporadically. In early days most of the people were involved

in agriculture or fishing but later they have shifted to some other profession like fish farming in local ponds and Betel leaf cultivation. The major observed features of occupational change are as follows.

Most of the people practice agriculture for earning. We have observed two different farming practices on the island. One group who does agriculture twice in a year mainly possesses a pond and another group capable of farming once in a year and does not possess a pond. People earn by Fishing primarily during monsoon. During the winter some people go to Jammu Island for drying fish and sell them later. Around 200-250 people have shifted to Kerala, Tamilnadu, Delhi, Mumbai or Kolkata for different income generating activities who are somehow engaged with fishing activities in earlier days. They go to these destinations for 5 to 6 months every year and most of them come back after that period. Ten female migrants among them have migrated individually to earn their livelihood.

A large section of the farmers has changed their land use pattern from simple

paddy cultivation to betel leaf farming. These people have lost their farmland and had no option except such shifting. This factor has not only made them poor but they have lost their social status too. Once they were the owner of the land and now they are working on other's land. Other farmers have shifted to fishing or any other occupation like Mason, service etc. An important share of such population is now involved in 100 days work. It is thus evident that almost around 80% of people had to change their occupation due to river erosion and changes in the island topography. Around 2.36% of people have become jobless.

However, there are many more problems the island people are facing due to the erosion. A table (No. 12) has been prepared based on the surveyed data to show the various impact of this problem on the local people.

Table 5 Impact of River Erosion on the local People of Ghoramara

Sl No.	Impact	Percentage of the total affected population
1	Loss of land, house and property	95
2	Unemployment	26.67
3	Poverty	22.20
4	Fear of erosion and uncertainty	25.54
5	Lack of health facilities	21.10
6	Impact on Education	18.89
7	Transportation and Communication	15.55
8	Deterioration of the quality of cultivated land	13.33
9	Frequent shifting	7.76
10	Flooding	7.78
11	Waterlogging	6.67
12	The problem of drinking water	5.57
13	Salinity of water	5.58
14	Power shortage	5.56
15	Impact on fishing	2.23
16	No problem	1.11

Source: Field Survey

It has been observed that the people living within the interior parts of the island in Mandirtala area are suffering from acute waterlogging especially during monsoon. On the other hand, the people living in peripheral areas are directly affected by land loss and frequent shifting of their residence. These people have to shift their houses almost every year as the river is engulfing the land very fast. The water has become very saline which in turn affected the pattern of agriculture in the inland area which directly distress the income of the island dwellers. The problems of livelihood are aggravated by the poor transportation and communication system, lack of health care facilities, power shortage, poverty, lack of job opportunity, fear of erosion and loss of land etc.

4 MAJOR PROBLEMS AND MANAGEMENT

The above study reveals that the situation is very critical in Ghoramara. The land loss and homelessness have forced people to migrate to other areas either for a job or for the place of living. People have lost their agricultural land and a huge modification took place in both their livelihood and lifestyle. In fact, the psychological impact is also significant. Moreover, due to migration, the family lives of the people get disturbed. Women have to play a much greater role in the family in the absence of the male member. They have to look after the children, elderly and also the cultivation related issues. Though the problem has been addressed by the Government the efforts are not satisfactory. Management has been done in three ways i.e. rehabilitation, Embankment and Preparedness.

4.1 REHABILITATION

(Samling, Ghosh, & Hazra, 2015) stated rehabilitation as a process which involves rebuilding the economic and physical livelihood, developing socio-cultural links and psychological acceptance to the altered situation. The first rehabilitation process in Ghoramara began during 1981-82. Around 45 families got rehabilitation in *Fuldubi* and *Gangasagar* from Ghoramara. Each family had got 6 bighas (approximately 0.97 hectares) of land there. During the interview, the members of these families told

us that on the account of displacement they received tarpaulins and blankets as immediate relief. The government also assisted in digging up ponds in the village during that phase.

During 1989-90, another group of people from Ghoramara were rehabilitated to Manasadwip- Jibantala and Manasadwip-Khasmal of Sagar and each family got 3 bighas (0.4816 hectares) of land. The number of families was 100 in this phase. To strengthen the rehabilitation process, 80% of these families have got their houses built under the Indira Awas Yojana run by the Ministry of Rural Development.

Till 1990 there was an arrangement of 141 rehabilitation units in Sagar. Again in 1996, some 36 families were relocated in the same area followed by another 5-6 families within a year. This time each family had got 1.5 bighas (0.2408 hectares) of land. Apart from land, 300 grams of wheat and 500 grams of rice were given to the affected families. As part of the larger livelihood, these families were given saplings of fruits and vegetables. They received training on how to plant those saplings under the MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) scheme and earn within a short time.

As per the local administration, at present, an effort is going on to rehabilitate another 35 families of Ghoramara in Sagar as soon as suitable land is found.

4.2 EMBANKMENT

A total of 2500 metre embankment has been constructed along the peripheries of Ghoramara Island. Among them, 1300 metres was completed by the Irrigation Department and 1200 metres by the Panchayat which was sponsored from the local MLA's (Member of legislative assembly) fund. Gram Panchayat looks after these matters, but due to the shortage of labour, sometimes they need active support from the Irrigation Department. After the construction of embankment, erosion has stopped in the Raypara area, a section of the Island.

4.3 PREPAREDNESS

Apart from the construction of the embankment, the *Panchayat* is trying to help the people whenever they get affected. A

Multipurpose Cyclone shelter has been constructed in *Ghoramara Milan Vidyapith*. People are aware of the erosion and so whenever there is a chance of damage to their houses, the Panchayat helps them to get shelter in school buildings or other areas and food is being supplied to these affected families.

5 CONCLUSION

Ghoramara has become famous throughout the world as a 'dying island'. Though the inhabitants of the island are not willing to leave their homeland until the end they have no option but shifting. They are always living with a fear of land loss and everything has become uncertain for them. This frequent shifting from one place to another has made their life troublesome and unsafe. A significant number of families have already arranged for an alternative residence elsewhere outside the island. However, most of the people of this island are poor and do not have any other option except waiting for the government help.

This forced migration of people affected the socio-economic, demographic and even cultural aspects of the inhabitants. Due to the huge loss of land, the demand to get a job on agricultural land and betel leaf farming have increased. Many people have become jobless and migrated to other areas for employment. The paddle van drivers (People who drive paddle vans on bare feet to ferry people from one place to another in the Island) have expressed their struggle to earn money as the number of van drivers have

increased from around 10 to 50 within the last 2 to 3 years due to lack of employment.

At present, the most immediate crisis is a fast erosion of Mandirtala-kheyaghat area. An embankment must be constructed throughout the peripheral areas of the island. The rehabilitation process must start immediately again so that a shelter can be provided to the landless people. As it is environment-induced damage, people must be compensated either by money or by land somewhere else. Alternatively, some other source of income generation has to be ensured for the people who have become jobless due to the loss of agricultural land and betel leaf farming. Else there is a chance of rising of crime rates in an otherwise peaceful island.

We also argue that the schools must be renovated immediately and extended up to class 12 so that the children do not have to move to other areas after the secondary examination. More teachers are required in these schools.

As the land is shrinking government agencies must consult to the expert planners to find out the proper land-use pattern and future planning of the area so that people don't have to migrate from their homeland. On the other hand, if the erosion of Ghoramara island is not controlled it will create enormous pressure of population and search of livelihood which will affect nearby places like Sagar Island and Kakdwip. The consequences can be fatal if not mitigated.

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ADOLESCENT HIGH RISK BEHAVIOUR: UNDERSTANDING THE INTERPLAY OF VARIOUS FACTORS WITH AN AIM TO LINK THEORY WITH PRACTICE**Kamal G. Manwani¹, Mahima Gupta²**¹Research Scholar, Amity Institute of Education, Amity University, Noida-201313, UP, India, *Email: kamal.gulati@student.amity.edu*²Associate Professor, Amity Institute of Education, Amity University, Noida-201313, UP, India**ABSTRACT**

High-risk behaviours are a set of behaviours which pose an increased risk of physical, social or emotional problems to an individual and society at large. These behaviours manifest as violence, substance use, risky sexual behaviour, suicide, and eating disorders. Adolescence is the age group that has the highest propensity for detrimental impact by the adverse consequences of such high risk behaviours. The available literature in related fields bears extensive information regarding the factors leading to high risk behaviours in adolescents. It is concluded, high risk behaviour in adolescents is not a phenomenon that can be attributed to a single factor. It is an interplay of various factors that determine, influence and make adolescents more susceptible to risk taking. In spite of these in depth studies and well explored facts, there is a lack in required interventions at a grassroots level to contain this issue. The aim of this article is to review the literature in this area and provide comprehensive insights pertaining to the factors contributing to high risk behaviour in adolescents. It also emphasises the need for more theoretical research to gain newer insights and understandings in this area furthering the cause for development of targeted intervention strategies.

Keywords: *Adolescents, mental well-being, high risk behaviour*

Introduction

High-risk behaviours are a set of behaviours which pose an increased risk of physical, social or emotional problems to an individual. The impact of these is far reaching in the sense that these not only impact over all development of an individual but have a resultant impact on the overall functioning of a society. Though these behaviours might be perceived as bringing certain short term positive benefits to the individual but are detrimental to larger goals of any society over time. High risk behaviour (HRB) therefore becomes an important factor to discover more about. Though HRB can impact all age groups, however the adolescents are most impacted by such behaviours since they are at a period of rapid mental, physical, social and emotional changes and HRB tendencies can negatively impact these growth phases. HRB in adolescents is seen as “disorder of misdirected motivation and impaired self-control” (Reynolds et al., 2013). It has serious implications in terms of both “morbidity and mortality” in adolescents (Bozzini et al., 2020).

While outwardly, adolescents start to look like adults, internally they are still going

through major changes. Neuro-biologically, their brain’s cortical development is not complete until they reach their mid-20s. Owing to the still developing Pre-Frontal Cortex in brain, their executive functioning skills like decision making, consequential behaviour and future oriented thinking, are not fully available to them and the hyperactive and impulsive limbic system overrides the reflective prefrontal cortical system (A, 2005). With the dichotomy of new expectations or responsibilities and mental faculties that are not yet fully developed, adolescents also become highly susceptible to stress. In order to get away from and cope with stress they tend to get drawn into high risk activities without being completely cognizant of the consequences of such acts (Guzman & Pohlmeier, 2014).

High risk behaviours are of various types but violence, substance use, risky sexual behaviour, suicide, and eating disorders are considered to be the HRBs of significant concern. (Tariq & Gupta, 2021). A strong inter-relationship in terms of one leading to another has been established between various HRBs like substance use,

sexually transmitted diseases (STDs), teen pregnancies and violence amongst adolescents (M.-L. MD, 1998). This implies that various HRB in adolescents do not prevail in isolation and their co-occurrence is a common phenomenon. It therefore becomes imperative to understand the various Determinants, Susceptibilities and Influencers of HRB in adolescents. To bring in the operational definitions, a determinant can be defined as a factor that decisively affects nature or outcome of something (*Definition-Oxford dictionary*). Influencer can be an individual or group that influences the behaviour or opinion of others (*Definition-Cambridge dictionary*). Susceptibility is lack of inherent ability to resist some extraneous agents (*Definition-Meriam-Webster dictionary*).

The current paper aims to contribute by reviewing some of the available relevant literature and presenting a succinct overview in light of these studies. It is a narrative literature review and gathers and synthesizes various literature reviewed with respect to HRB in adolescents to provide a comprehensive overview to readers. It uses the available literature to categorize HRB into Determinants, Susceptibilities and Influencers of HRB in adolescents. It also discusses how the prevalent information can be appropriately used for future actionable intervention strategies and studies so as to form a link between theory and practice.

Rationale of the review

This review article attempts to study adolescent HRB from the lens of various studies done in this area so as to present a comprehensive overview of it. It aims to help identify the gaps that exist between theory and practice so that what is researched in our labs is made available to the stakeholders and support them in developing focused interventions for adolescents to control HRB in them.

Method

A review of published studies most of which were authored 2000 onwards, was performed to identify the factors influencing HRB in adolescents. The findings of this review article aim to provide evidence-based critical information to address the problem of

HRB in adolescents and design focused interventions. It will also identify perceived gaps and suggest areas for further studies.

Review Question

What are the major factors that determine, influence and make adolescents susceptible to HRB?

Article Search

Numerous online resources published in English language were considered for the review. These included peer-reviewed journal articles and reports in the areas of adolescent HRB for both male and female adolescents in the age group of 13-19 years of age. Keywords like Adolescents, HRB, Adolescent brain, risky behaviour, parent-adolescent relationship, peer relationships in adolescents, adolescent mental well-being, influences & determinants of adolescent HRB, risky sexual behaviour in adolescents, and drug use in adolescents were used for targeted search of the relevant literature. A reference list was created using Mendeley. These relevant studies were briefly overviewed for initial screening and the most relevant ones to the title of the paper were selected for in-depth study to understand their findings as detailed herein after in this paper.

Scope of the Research

The paper focused on studies that provided information on following domains:

- i. Factors that make adolescents more susceptible to HRB
- ii. Factors that influence HRB in adolescents
- iii. Factors that determine HRB in adolescents

Based on the above information presenting a factor-wise objective overview of all the researched domains and suggesting the implications of their findings in developing focused interventions for adolescents to control HRB in them.

Findings

The following major factors came up as contributing to HRB in adolescents:

Neurobiology

Neurobiological perspective offers the paradoxical perspective that in an adolescent's brain full level cognitive control is still not available while the bodily sensations peak due to onset of puberty. This

gap in maturation of two critical brain areas pulls the adolescents towards risky behaviour in order to meet the bottom-up reward process (CF, 2013). In adolescents, judgement, rationalization and prudence have negligible influence on the reward valuation, reward reinforcement and related emotional reactivity due to the under developed stage of the Prefrontal cortex (Casey et al., 2008). Studies indicate that adolescents have immature abilities in implementing basic cognitive control and hence demonstrate high degree of risk-taking behaviour (Luna, 2009). Due to this inherent difference in evolutionary maturity periods of various brain areas and reorganization happening in brain's regulatory area, adolescence ends up being a period of high vulnerabilities (L. Steinberg, 2005).

It was found in a study with 61 children in which their structural MRI and executive functions were analysed, the increased early life stressors lead to smaller pre-frontal cortex which is a brain area responsible for higher order thinking skills, resulting in poor executive functioning (Hanson et al., 2012). In a comparative study conducted between 676 children who were subject to early life stressors like being physically and sexually abused and neglected and 520 non-abused and non-neglected children, the former cohort showed significant increase for development of Major Depressive Disorder. Thus, an individual's vulnerability to develop depressive disorders in young adulthood depends a great deal on their stress response during the early life experiences (CS et al., 2007). All this could lead to increase in high risk behaviour particularly in adolescents where the fully mature emotional brain in absence of regulation by rational and analytical mental faculties and in presence of stressors puts adolescents at a higher risk of harm like injury, depression, anxiety, drug use, and addiction (Kelley et al., 2004).

Identity Styles

Identity styles are the way adolescents approach problems and maintain their sense of identity or sense of self (*Identity Style – APA Dictionary of Psychology, n.d.*). Identity styles are classified as:

-Informational style in which an individual is problem focused, feels independent, seeks social support and does facilitative use of anxiety.

-Diffuse-avoidant style where an individual uses emotion focused coping tactics, seeks pleasure, gets into social distancing and engages in wishful thinking & procrastinates.

-Normative style where an individual avoids the stressor, sticks to value systems, and focuses towards stress reducing coping mechanisms (Berzonsky et al., 2011).

A study on 205 adolescents also established that addiction vulnerability was higher in Diffuse-avoidant style and lower in Normative and Informational styles (M. MD et al., 2018).

Another study conducted on 384 adolescents revealed Informational style and Normative style have negative correlation with HRB tendency while the Diffuse-avoidant style bear a positive correlation with HRB tendency amongst adolescents (Zabihi et al., 2019).

Genetics and Epigenetics

The immature and still developing adolescent brain is highly prone to influences of interactions between inherent genetic and environmental factors (Laurence Steinberg et al., 2015). It is a combination of genetic predisposition and environmental factors that leads to such behaviours (Harden et al., 2008). A weak pre-frontal cortex leads to greater stress and these if met with genetic risks lead to high risk behaviour. It has been seen that adverse rearing experiences lead to novelty seeking behaviour in adolescents. In presence of punitive parenting, novelty seeking becomes more enhanced if a particular gene is present in an individual (Blum et al., 2015).

A study revealed that genotypes influence even the formation of friendship clusters (JH et al., 2011). Also the tendency to consume tobacco, alcohol and cannabis is controlled by presence of certain genes (Olsson et al., 2013).

Working Memory

Working Memory is a neural system in brain that has limited capacity and allows for temporary storage of information which is

goal-relevant and important for use in higher order executive functions like decision making and planning (EK & JD, 2001). It has been found that weak working memory is associated with increased impulsive behavioural tendencies (CA et al., 2010) and so is lower delay discounting (higher self-control) which is negatively correlated with working memory (NA et al., 2008). Limited working memory functioning can predict the greater impulsive decision making style where short-term consequences of action are favoured over long-term consequences of action (JM et al., 2003). Thus, differences in working memory is a reliable predictor of early initiation of sexual activity in adolescents and unprotected sexual activity (Khurana et al., 2015).

Peers

Studies show that in order to gain acceptance adolescents tend to conform more to their peers than adults (Knoll et al., 2015). Peer socialization is an essential part of adolescent development. Success amongst peers is an essential component of adolescence. In the process to gain acknowledgement and acceptance, they tend to become more like their peers in behaviour and attitude which includes various high risk activities (Brechtwald & Prinstein, 2011).

Evidence suggests peer interactions lead to amplification of problem behaviours in early to late adolescence. Adolescents are more likely to indulge in HRB in the company of their peers than when alone (Dishion & Tipsord, 2011). Even High risk behaviour of tobacco use in Adolescents is influenced by peer pressure. This was evidenced to be so influential that even the selection of peers happened to be based on their smoking status (BR et al., 2007).

Family

Studies show that family has a great influence on adolescents. Family conflicts leading to poor monitoring by parents is also a contributory factor in adolescents engaging in risky habits (*Social, Environmental, Cognitive, and Genetic Influences on the Use of Tobacco Among Youth - Preventing Tobacco Use Among Youth and Young Adults - NCBI Bookshelf*, n.d.).

Among familial and extra-familial factors, family based factors are believed to have greater influence on adolescents with respect to risky behaviours. In a family system that is secure and parents are seen as stable and united adolescents display stable behaviour despite of changing environmental factors. Families with challenges like conflicts causing less available care for adolescents and resulting in strained family relationships, financial instability, lack of sex education by family, lack of discipline where parents themselves engage in drinking or risky sexual behaviours, absence of parents, volatile environment influence adolescents negatively and lead to their engaging in HRB (Anyanwu et al., 2020).

World Health Organization states that there is a crisis due to early sexual engagement among adolescents leading to unplanned pregnancy and sexually transmitted diseases, it is imperative to shift focus on encouraging adolescent friendly familial set-ups that have parents/caregivers who are empowered to support the adolescents (*Health for the World's Adolescents A Second Chance in the Second Decade*, 2014).

Internet Use

Diagnostic and Statistical Manual of Mental disorders; 5th Edition (DSM 5) by American Psychiatric Association (APA), has included Internet Gaming Disorder as behavioural addiction (Moran, 2016).

In a study conducted with 11356 school going adolescent with a mean age of 14.9 years it was concluded psychopathology and suicidal behaviour are strongly related to pathological internet use. When participating adolescents were divided into 3 categories of type of internet users i.e. Pathological Internet Use (PIU), Adaptive Internet Use (AIU) and Maladaptive Internet Use (MIU), it was seen that prevalence of psychopathology, depression, suicidal ideation and attempts, conduct problems, anxiety, and hyperactivity were much higher amongst PIU as compared to AIU and MIU (M et al., 2014).

In a study conducted to understand relationship between internet addiction and Self-Injurious behaviour in adolescents, it was seen that there is a strong and significant association between the two. It was concluded

that post adjustment of confounding variables, 100% of internet addicted adolescents showed increased risk for frequent self-injury(LT et al., 2009).

Relationship with Parents

It is widely observed that merely increasing awareness amongst adolescents has negligible impact on preventing them from getting into HRB based on the consequences of such acts. Rather, parental guidance has shown to have a lasting impact on the reduction of HRB taking in adolescents. Establishing a healthy parent-adolescent communication is very much needed to prevent HRB amongst adolescents (BV et al., 1999). The relationship with parents is seen as a key deciding factor in involvement of adolescents in HRB like drug, tobacco, alcohol use, violence, and sexual relationships. Monitoring by parents and effective communication play a great role in preventing drug initiation. It also delays the initiation of alcohol consumption and sex. It has an impact on decreasing risk taking behaviours among adolescents (Ryan et al., 2015). Another study conducted on HIV prevention in adolescents concluded that increasing parental involvement in communicating transmission awareness among adolescents is one of the key strategies to accomplish the goal of HIV prevention amongst adolescents (WL et al., 2018). Poor bonding and poor quality communication between parent and adolescent and misconduct by parents weaken the support system for adolescents and might lead to their getting attracted to risky sexual behaviour at an early age (Anyanwu et al., 2020). Authoritarian parenting, that exhibits strict control and monitoring with low emotional involvement and reduced daily conversation has negative effect the parent-adolescent relationship (Guilamo-Ramos et al., 2006).

Social Relationships in School

In a study conducted on 930 secondary school students, it was reported that those students who perceived low school social cohesion were more likely to engage in suicidal ideation, binge drinking, drug use and physical fights (Dishion & Tipsord, 2010).

The National longitudinal Study of Adolescent health identifies school social connectedness as a protective factor for high risk behaviour (R. MD et al., 1997). Supportive social relationships act as protection against adolescent HRB. High perceived social cohesion and high perceived parental social support have a positive impact on reducing risk taking behaviour like violence, suicidal ideation, substance use and risky sexual behaviour (Springer et al., 2006).

Self-Control

Self-control is the capacity of an individual to exert control over his thoughts, feelings, actions and impulses and give priority to distal motives over proximal ones (Fujita, 2011).

In a meta-analysis of 191 studies concerning individuals aged 10-22 years, it was found that poor parent-adolescent relationship and a lower perceived parental support increases the chances of high risk taking behaviour in adolescents. However, this risk taking tendency is much reduced in adolescents who display greater self-control (Liu et al., 2019). This can be inferred meaning that increasing self-control in adolescents can overcome the undesirable impact of a conflicting parent-adolescent relationship. It was also concluded in a study that early experimentation to tobacco use were related to temperamental difficulties and reduced self-control (TA & SD, 1999).

In a data collected from 7291 adolescents in eastern and western Europe it was concluded that Low self-control was positively correlated with associated with all three health-compromising behaviors i.e. drug use, risky sexual behaviour and alcohol use (Vazsonyi et al., 2006).

Other Determinants

Apart from the above determinants there were others too that were found to trigger HRB in adolescents. With respect to early tobacco use amongst adolescents it was reported that major factors leading to this HRB that need greater research and understanding are low socioeconomic status, poor academic achievement, lack of school support, low self-efficacy in refusing to use and poor self-image (Department of Health et al., n.d.). Mood and need for relief from

negative affect also play a role in adolescents engaging in risky behaviour of substance use (Colvin & Mermelstein, 2010).

Discussion

Based on the review of above literature the key findings can be categorized within 3 broad domains of Susceptibilities, Influencers and Determinants, and can be summarized as below:

Susceptibilities

In view of the reviewed studies it can be understood that in order to fully achieve the desired outcomes to address HRB issues amongst adolescents, a critical comprehension of brain based research is essential. The immature pre-frontal cortex and fully developed limbic reward system in adolescent brain can have a resultant effect of immature decision making leading to undesirable consequences. Neuroscience has been seen to have little impact on designing educational content (Bowers, 2016). There have to be greater linkages between education, counselling practices and neuroscience. They can not only provide insights into effectiveness of counselling interventions but also indicate whether the direction of travel is in sync with the counselling goals. These can also help catch certain behaviours in nascent stage for better management. Knowing that trust in others, ability to regulate ones emotions, and ability to interact with the world around at early stages of life leads to a basic sense of security and functionality at a core level, a visualization of the impacted neural regions in cases where there have been early life adversities can lead to healing of these psychological wounds through targeted interventions (Mousa Botros, Gabrielle Hodgins, 2019) and ultimately reduce risk taking behavioural tendencies.

Including awareness sessions on neurobiological aspects of an adolescent brain, as part of educators' training curriculum can go a long way in empowering the education system to deal with challenges that come as part of dealing with adolescents. Psychiatric departments of hospitals can be linked to educational institutes to manage mental-health needs of adolescents.

Also with respect to identity styles, they have been found to be a strong determinants of HRB prediction. Assessing identity styles of adolescents in safe school settings can be very beneficial so that their vulnerabilities can be understood and addressed accordingly rather than waiting for the behaviours to manifest themselves and then look for managing the consequences.

Likewise, studies related to genetics and epigenetics i.e. how behaviours and environment can modulate the gene expression in an individual, affirm that it is crucial while designing interventions for control of HRB in adolescents. Genetic factors have been believed to influence substance use, however, mere presence of gene leading to expression of substance use behaviour is not sufficient. Several other studies done in this field strongly suggest close linkages between genetic and environmental factors in development of HRB amongst adolescents.

It is further proposed that early genetic testing for addiction risk genes in adolescents showing propensity towards risky behaviours can offer critical information to be utilized by various stake holders to combat this significant global issue that comes as a barrier for adolescents in leading a productive and happy life (Blum et al., 2015). A confidential, sensitive early genetic risk diagnosis can be used for designing targeted interventions and controlling the environment of these adolescents that will go a long way in tackling this problem.

Looking at the relationship established between Working Memory and HRB it is evident that assessment of Working Memory capacity can serve as a crucial lead in devising and including Working Memory enhancing activities and software in curriculum. Working Memory training has been largely done in labs or for trial purposes but no regular classroom practice for training in Working Memory exists. Areas to enhance students' Working Memory in educational set-ups can be explored to achieve promising outcomes in controlling HRB in adolescents.

Influencers

Looking at high impact of peers on adolescent HRB measures need to be taken in

managing “Peer Contagion”. Though peer aggregations are seen as strong options for intervention strategies it becomes imperative to monitor the amount of time in a group specifically where the interactions are unstructured or poorly supervised, establishing prosocial norms where peer aggregations are there, providing training in behaviour management and supervision to teachers and other adults interacting with adolescent groups. With respect to the family, right now the practices in education and counselling limit family-oriented interventions to only those adolescents who have displayed HRB. In view of above studies it is seen that it will be a good practice to invest in developing strong, empowered family relationships which can actually check emergence of HRB. Interventions must be made as family-centred as possible (Dodge et al., 2006).

Studies related to impact of internet use give a clear indication that if internet use is checked at MIU stage it can lead to stopping the behaviour from becoming pathological thereby addressing HRB before it manifests itself in adolescents. Making the Internet Use Questionnaire available to parents and educators of adolescents can go a long way in identifying and checking internet use at an early stage

Determinants

The reviewed studies indicate that parental relationship bears a powerful impact on the reduction of HRB in adolescents. A limited cognitive ability and insufficient reasoning in adolescents needs clear and open communication with parents. Therefore, the models for intervention must have clear roles for parents to play to maintain effective communication in the adolescent-parent relationship.

This implies that it is important that adolescents feel supported by parents and society. It is their perception of support that plays a key role rather than the actual support provided, hence community living with inter dependent societal relationships can be a positive contributor in avoiding HRB and conscious efforts need to be put to accomplish this goal.

With self-control being one of the key determinants of HRB in adolescents, it can be a good practice to train adolescents in Self-control. With adolescents having greater tendency to get stressed, challenging tasks can overwhelm them. Here the stakeholders need to take responsibility of mapping these tasks out for adolescents. Breaking the larger goals into short, medium and long-term goals can make them feel more in control of things thereby having a reduced need to seek instant gratification as a coping mechanism and more self-control.

Result

A large number of empirical studies have been conducted and published in the area of adolescent HRB during the past two decades. Put together, these studies gather a body of knowledge that brings emphasis on the need to address various factors that lead to HRB in adolescents. It is also evident that HRB in adolescents is not a phenomenon that can be attributed to a single factor. It is an interplay of various factors that determine, influence and make adolescents more susceptible to risk taking. Therefore, any strategy that looks at addressing this issue has to include all these factors. However, there seems to be an absence of studies that integrate the individual findings and deal with the impact of associations and interactions between various independent and dependent variables. This makes designing effective interventions and linking theory with practice to address the issue of HRB in adolescents, a challenge.

Conclusion and Suggestions

Though a lot of research has happened that has considered various factors contributing to emergence of HRB amongst adolescents, the interplay of various social, psychological, genetic, neurobiological, cognitive, emotional and physiological factors need to be studied in greater depth to further understand and resolve this issue. Most of the research in this field is still emerging.

At this juncture, more studies driven by theory need to be taken up to better our understanding, test our assumptions, decide the next steps and integrate the findings in this area. Approaches involving data analytics to bring forth the interaction of above

discussed complex theoretical factors and demarcate positive and negative factors can greatly serve the purpose.

Moreover, there is need to develop sustainable and culturally relevant models that aim at engaging adolescents, their parents/ primary caregivers, schools, community, health care systems, legal set-ups and policy makers to achieve the desired results. A discussion of how to develop these is not in the scope of this paper and opens up possibility for further research.

In addition to this, factors leading to positive behaviour and withdrawal from risky behaviour in adolescents need to be further studied. With studies showing that flourishing or mentally healthy youths display lower prevalence of depressive behaviour and difficulties related to adjustment and rather show more prosocial behaviour, the need for expansion of our knowledge of positive mental health for adolescents becomes very important (Singh et al., 2015). Thus, in order to check the emergence of HRB the interventions must focus on decreasing risk

factors and increasing protective factors during adolescence because prevention of high risk behaviour is much easier, cost-effective and less burdening than its treatment. An environment that promotes social support, community living and bonding, societal inter-dependence and mutual contribution should be encouraged for the avoidance of HRB in adolescents.

The ultimate aim must always be that of reintegration, of encouraging young people towards responsible citizenship (*The State of the World's Children 2011: Adolescence - An Age of Opportunity - UNICEF DATA*, n.d.). These findings can not only be used in forecasting the trends and predicting occurrence of HRB in adolescents but also can be used to develop focused Educational and Counselling interventions for adolescents. Therefore, the understanding the interplay of Susceptibilities, Influencers and Determinants, in order to link theory with practice is greatly needed to bring a real difference at grassroots level and address the issue of adolescent HRB.

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TESTING OF TECHNICAL TRADING RULES ON AUTOMOBILE AND CAPITAL GOODS SECTOR

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ABSTRACT

The present study re-examines the efficacy of technical trading tool Exponential Moving Average (EMA) before and after considering the transaction cost for the period of 16 years that is 1st January 2003 to 31st December 2018 on daily closing prices of two indices i.e., S&P BSE Auto and S&P BSE Capital Goods Index. The robustness of trading strategies is also tested in four sub-periods having of four years each. The result displays that returns based on EMA(5-20) strategy are higher for both the sectoral indices and the returns are statistically significant at different level of significance over the whole sample period but the EMA(5-10) tool have effective prophetic power in the 1st sub-period (1st January 2003-31st December 2006) but in rest of the sub-periods EMA(5-10) show average predictive power for the sectoral indices. EMA (20-50) and EMA (50-200) have average predictive power in all the study periods. The returns of technical strategy are higher in case of Capital Goods Index than Auto Index in the study under consideration. There are some cases of EMA(20-50) and EMA(50-200) in which transaction cost removes the trading profit except EMA(5-10) and EMA(5-20). The performance of Capital Goods Index has been given 1st ranking in all most all the cases on the bases of Compound Annual Growth Rate (CAGR).

KEYWORDS: Technical Analysis, S&P-BSE Auto Index, S&P-BSE Capital Goods Index, Exponential Moving Average (EMA).

1. INTRODUCTION

In the trading world technical analysis is most probably used by the traders to capture the entry and exit point for trading by observing the past security prices with trading volume. The basic assumption behind the technical trading is that the present price patterns will be reoccurring in the near future and these patterns gives the indication to the traders in the initial recognition of trading signals (Lento 2007 and Yu et al. 2013). Initial experimental studies have undoubtedly revealed that technical trading tools such as moving average are able to beat the buy and hold strategy as stated by many studies such as Gencay (1998), Rodriguez et al. (1999), Lento et al. (2007), Yen and Lin (2010), Zakamulin (2014) and Kresta and Franek (2015). Trading range breakout (TRB) tool also produce superior returns as stated by Rodriguez et al. (1999), Lento et al. (2007), While Lebron (1999) and Zakamulin (2014). Ticknor (2013) is also in favor of

weak form efficiency because the logic behind this is fundamental and technical analysis are equally important. Zarrabi et al. (2017) documented that those technical traders can use technical trading strategies with econometric models to measure the fluctuation in security prices during trading period. The key objective of the present study is to investigate the efficacy of technical trading tool (EMA) on sectoral indices i.e., S&P BSE Auto and S&P BSE Capital Goods. Auto and Capital Goods sector are the key sectors for the growth of Indian economy. These sectors of India have become worldwide business players. So, worldwide all the economic and non-economic factors affect these sectors like currency appreciation and depreciation. These sectors are the fastest growing segment of India. Both the sectors directly affect the balance of trade, GDP, import-export and growth rate of Indian economy. So, there are lots of opportunities in these sectors. Trading in different overseas

markets makes these sectors riskier which increase market volatility. So, this is interesting to study both the sectors from trading point of view. If market players make the right strategy to enter and exit in the trading position can enhance the trading profitability. The present study uses the most popular technical trading tool (EMA) which is the one of the preferred choice of traders. The study also calculates the Sharpe and Alpha ratio to compare the risk level with the trading returns. Transaction cost is also considered to analyze the effect of transaction cost on the trading profitability. The present study has whole study period with four sub-periods to test the robustness of the returns. The remaining fragment of the present study is organized as follows: Section-II presents the review of literature. Section-III describes the research methodology used in the study. Section-IV analyzed the empirical results and section-V concludes the results of the study.

2. REVIEW OF LITERATURE

A lot of research studies on technical analysis of securities have been published. Some research looked at the efficacy of technical trading methods, while others found little, whereas others revealed a mixed outcome. So here are some studies on technical analysis.

Gencay (1998) observed the statistically significant returns from the moving average and the returns produced by technical trading strategies are (10.8%) higher than passive strategy during the period of 1980 to 1988. But during the period from 1939 to 1950 the performance of technical trading tools is average which means technical trading strategies show non-linear return on DJIA Index during the whole study period. **Lebaron (1999)** found that technical trading strategies generate the statistically significant foreign exchange market's return and the study also concludes that frequent trading can minimize the transaction cost. **Rodriguez et al. (1999)** stated that trading range breakout (TRB) and moving average (MA) show more buying signals than selling signals and the returns from long positions are more statistically significant for Madrid Stock exchange. **Osler, (2000)** stated

the importance of published support and resistance level in stock trading by observing the statistically significant returns. **Rodriguez et al. (2000)** observed the outstanding performance of Artificial Neural Network (ANN) in the downward market trend. The returns are more than 50% before considering the transaction cost. But in the bull phase it does not work much. **Fong and Yong (2005)** examined the 30 internet companies by using technical indicators and found the abnormal returns up to 63.2% for large cap in comparison to buy and hold strategy. But the technical indicators are not successful in the volatile market. It creates -109.3% commutative returns for mid cap and -44.6% for small companies. **Lento et al. (2007)** stated that different kind of technical tools are successful in different markets because the same rules are not helpful in generating abnormal returns in every market. So, the traders must use the combination of multiple technical trading tools. The study observed that trading range breakout (TRB) and moving average (MA) generates superior returns for NASDAQ, CANADA/US and S&P/TSX while filter rules work successfully for the CANADA/US market. The aggregate average returns generated by technical trading tools are between 8.7% to 14.4%. **Metghalchi et al. (2007)** observed that increasing moving average and standard moving average generates statistically significant returns in comparison to buy-and-hold strategy and the transaction cost does not eliminate the returns. **Kamath (2008)** observed the great combination of price and volume strategy. The study found that price and volume strategy generate 237% extra abnormal returns for Santiago stock exchange. **Yen and Lin (2010)** observed the outstanding performance of relative strength index (RSI), moving average (MA), on balance volume (OBV) and Momentum strategy with volume strategy in the downward phase for the commodity and financial market but these strategies do not work properly in the upward movements. **Cialenco and Protopapadakis (2011)** found that using a moving average (MA) with an Alexander filter rule does not yield abnormal returns in developed country's

currency trading. **Wang et al. (2012)** analyzed the data provided by the Taiwan economic journal and Taiwan stock exchange regarding the stock trading, trading returns, limit order and trading behavior of different market players (individual, institutional and foreign investors). The study observed that technical trading tools (KD and MA) with these kinds of information increase the trading profitability of traders. The study also concludes that foreign investors use more technical trading signals than retail traders for placing orders. Saucer and resistant levels, as per **Zaprains and Tsinaslanidis (2012)**, are unable to produce extra unusual returns. **Ulku and Prodon (2013)** stated that the performance of moving average (MA) is superior to moving average convergence/divergence. The returns produced by moving average is 9.33% more than passive strategy for the emerging and developed market. **Zakamulin (2014)** observed that moving average (MA) with market timing strategy are not able to generate superior returns than buy and hold strategy for the bond and stock market index. **Narayan et al. (2014)** deduced that momentum trading strategy produce 2.97% significant abnormal returns than buy and hold strategy for different sectoral stocks listed on the NSE. For stock trading on the National Stock Exchange (NSE), **Boobalan (2014)** identified the optimum mix of technical trading tools and candlestick chart patterns. Even after accounting for transaction costs, **Kresta and Franek (2015)** presented a realistic perspective on the usefulness of 12500 distinct combinations of moving average (MA) tools on the Czech Security Market. **Royo et al. (2015)** stated that different Flag chart patterns with different stop loss and target profit strategies generates superior return for DAX, DJIA and FTSE index. These strategies generate 180.2% extra abnormal return in comparison to passive strategy. **Chen et al. (2016)** observed the effectiveness of technical trading tools. The technical trading strategies produce 37% extra returns than buy and hold strategy for the Taiwan security market, but not for the option trading. **Zhang et al. (2016)** stated that technical trading strategies are more powerful in

Chinese stock market than American security market because the Chinese traders are more dependent on technical trading signals rather than American traders. **Arevalo et al. (2017)** examined the multiple combination of chart patterns (Candlestick and Flag) and moving average strategy with dynamic stop loss and take profit and found the statistically significant returns over the buy and hold strategy. Dynamic stop loss and take profit strategy improved 134.34% and moving average 200% returns than buy and hold strategy. Multi objective evolutionary algorithms combined with technical methods, according to **Macedo et al. (2017)**, enhance the profitability of traders. **Weng et al. (2017)** found that combining financial experts' opinions, internet data, and Google news with technical trading can increase market players' trading profitability. **Zarrabi et al. (2017)** examined the False Discovery Rate (FDR) model on forex trading and found that this model run a different kind of trading tools which increase the trading profitability of market players.

3. DATA AND METHODOLOGY

This Section of the study represents the data and methodology which are used for the analysis of the returns of technical trading strategies. This section has three sub-sections such as research objective, research hypothesis and research methodology and these sub-sections further parted into sub-parts according to the requirement of the study.

3.1 RESEARCH OBJECTIVES

The key objective of the study is to analyse the effectiveness of technical analysis on S&P Auto and S&P Capital Goods Index. To achieve the main purpose, the exponential moving average (EMA) (appendix) has been used to measure the returns. Compound annual growth rate (CAGR) is used to measure the annual returns of the technical trading tools while Sharpe and Alpha ratio is used to compare the returns of strategies with market returns and risk associated with it.

3.2 RESEARCH HYPOTHESES:

H₀₁: There is no difference in the returns of exponential moving average (EMA 5-10) and passive strategy.

H₀₂: There is no difference in the returns of exponential moving average (EMA 5-20) and passive strategy.

H₀₃: There is no difference in the returns of exponential moving average (EMA 20-50) and passive strategy.

H₀₄: There is no difference in the returns of exponential moving average (EMA 50-200) and passive strategy.

H₀₅: The returns generated by different EMA strategies are not different.

3.3 RESEARCH METHODOLOGY

The methodologies used in the research to achieve the main objective are as under:

Data Sources: The study uses the daily closing price of S&P-Auto and S&P-Capital Goods Index over the period of sixteen years from 1st January 2003 to 31st December 2018 from Bombay Stock exchange (BSE). The number of observations is 3980 per index.

Statistical Tools: The present study uses the different kind of statistical tools such as Geometric Mean, Standard Deviation and Brock T-statistic which are as under:

Geometric Mean: It measures the periodic growth rate of returns on the investment. The mathematical formula of Geometric mean is as under:

$$GM = \sqrt[n]{Return_1 \times Return_2 \times \dots \times Return_n} \quad (1)$$

T-Statistics: T-statistics is used for evaluating the returns of any technical trading tool which is different from the buy and hold strategy. It also measures the significant difference between the mean buy and sell return. The Brock test statistics is as under:

$$t = \frac{x(b) - x(h)}{\sqrt{\frac{Var(b)}{N_h} + \frac{Var(b)}{N_b}}} \quad (2)$$

Where X (b) measures the average returns from buy position and X (h) represents the average return of the passive strategy. Variance of buy returns is denoted by Var(b). T-test is also used for the average sell returns and aggregate average (buy-sell) returns.

Technical Analysis Tools: This study used the EMA 5-10, 5-20, 20-50 and 50-200 days.

Effectiveness of Technical Indicators: The current study uses Brock et al. (1992)'s recommendation that technical trading signals have prophetic potential if they provide positive (negative) returns over long (short) days to investigate the predictive power of technical trading instruments. Over the passive approach, the aggregate average returns (buy-sell) are statistically significant.

4. EMPIRICAL RESULTS

The study in this section analyzes the hypothesis by describing the results of Exponential moving average strategy. This section presents the mean buy and sell returns and aggregate average returns of trading strategy in comparison to buy and hold strategy. Alpha and Sharpe ratio is also presented here to analyze the risk and returns aspects of technical trading. Descriptive statistical analysis is also presented here to summarize the return statistics.

Sub-Section (A): Descriptive Statistical Analysis

In this section the descriptive statistical analysis summarizes the return statistics for the basic analysis of data. Here it presents the mean, standard error, median, standard deviation (SD), sample variance, kurtosis, skewness and number of observations. All these statistics are presented in table-I.

Table-I Descriptive Statistical Analysis

Panels	Statistical Analysis	S&P BSE Auto	S&P BSE Capital Goods
Panel-I	Mean	0.00168	0.00232
	Standard Error	0.00049	0.00053
	Median	0.00252	0.00262
	SD	0.01560	0.01680

	Sample Variance	0.00024	0.00028
	Kurtosis	3.31714	11.63362
	Skewness	-0.53048	-1.12234
	Count	1009	1009
Panel-II	Mean	0.00062	0.00053
	Standard Error	0.00057	0.00075
	Median	0.00114	0.00108
	SD	0.01798	0.02350
	Sample Variance	0.00032	0.00055
	Kurtosis	4.21283	6.50544
	Skewness	-0.38839	0.45408
	Count	990	990
Panel-III	Mean	0.00060	0.000002
	Standard Error	0.0004	0.00053
	Median	0.00079	0.00012
	SD	0.01260	0.01655
	Sample Variance	0.00016	0.00027
	Kurtosis	0.89606	0.96906
	Skewness	0.13429	0.01487
	Count	992	992
Panel-IV	Mean	0.00011	0.0002
	Standard Error	0.00036	0.00039
	Median	0.00076	-0.0001
	SD	0.01146	0.01235
	Sample Variance	0.00013	0.00015
	Kurtosis	3.13041	4.45187
	Skewness	-0.44912	0.16890
	Count	989	989
Panel-V	Mean	0.00076	0.00077
	Standard Error	0.00023	0.00028
	Median	0.00119	0.00092
	SD	0.01465	0.01777
	Sample Variance	0.00021	0.00032
	Kurtosis	4.19362	8.23904
	Skewness	-0.35488	0.04021
	Count	3980	3980

Source: compiled by the researcher

Table-I represents that in the panel-I (1st January 2003-31st December 2006) the mean return of both the sectors is positive. Standard deviation of Capital Goods Index is higher than Auto Index. So, the volatility is high in the returns of Capital Goods Index. The median value of Capital Goods Index is higher than Auto Index which show the existence of extreme negative values in the data series. The return series of both the index is negatively skewed which shows the persistency in the return series. The median values of each index are higher than the mean values which indicates the downward movement in market since the long period. Kurtosis of both the index is more than three which means the returns series have heavier tail than normal distribution. Standard error of the return series is less than mean values which show the less reliability in the mean returns. In the panel-II (1st January 2007-31st December 2010), the mean return of both the index is positive. Standard deviation of Capital Goods Index is maximum which show the higher volatility in the return series in comparison to Auto Index. Auto index have high median value in the return series in comparison to Capital Goods Index. The return series of the Auto Index is negatively skewed which show the downtrend in the Auto sector. Kurtosis of both the sectors is more than three which show that the returns series have heavier tail than normal distribution. The median values of both the index are higher than the mean values which indicates the downward movement in market since the long period. Standard error of the return series is less than mean values in case of Auto Index which show the less reliability in the mean returns. But the return series is more reliable in case of Capital Goods Index. In the panel-III (1st January 2011-31st December 2014), the mean return of both the index is positive. The volatility in the Capital Goods Index is higher than Auto Index because the standard deviation is higher than Auto Index. The median value of Auto Index is higher than Capital Goods Index. The Return series of both the index is positively skewed. Kurtosis of both the indices is less than three which show that return series have not heavier tail in comparison to normal

distribution. Reliability of return series in case of Capital Goods Index is higher than Auto Index because standard error of return series in case of Capital Goods is higher than mean value. In the panel-IV (1st January 2015-31st December 2018), the mean return of both the index is positive. Standard deviation of Capital Goods Index is maximum which show the higher volatility in the return series in comparison to Auto Index. Auto index have high median value in the return series in comparison to Capital Goods Index. The return series of the Auto Index is negatively skewed which show the downtrend in the Auto sector. Kurtosis of both the sectors is more than three which show that the returns series have heavier tail than normal distribution. The median values of Auto index are higher than the mean values which indicates the downward movement in market since the long period. Standard error of the return series is more than mean values in both the Index which show the more reliability in the return series. In the panel-V (1st January 2003-31st December 2018), the mean return of both the index is positive. Standard deviation of Capital Goods Index is maximum which show the higher volatility in the return series in comparison to Auto Index. Auto index have high median value in the return series in comparison to Capital Goods Index. The return series of the Auto Index is negatively skewed which show the downtrend in the Auto sector. Kurtosis of both the sectors is more than three which show that the returns series have heavier tail than normal distribution. The median values of both the index are higher than the mean values which indicates the downward movement in market since the long period. Standard errors of the return series is less than mean values in both the Index which show the less reliability in the mean returns.

Sub-Section (B): Standard Test Result of Exponential Moving Average (EMA)

The average return value produced by passive strategy for the whole study period (1st January 2003-31st December 2018) of Auto Index is 0.00076 (19% p.a.) with t-value (3.304) and standard deviation (SD) of (0.01465) and average return value produced by passive strategy for the Capital Goods

Index is 0.00077 (19.25% annually) with the t-values(2.734) and standard deviation of (0.01777). The study uses the 1% (1.28), 5%(1.64) and 10% (2.58) level of significance with their critical values. This section represents the average buy and sell returns and aggregate average returns (buy-sell) of exponential moving average with the corresponding t-values in the brackets. The

number of long and short selling days with standard deviation. The annual aggregate returns of buy/sell and buy(sell)>0 is also presented here. Table-II presents the upshots of Exponential Moving Average (EMA) for the whole sample period (1st January 2003-31st December 2018) and for four sub periods of four years each for the indices of Auto and Capital Goods.

Table-II Standard Test Result of Exponential Moving Average (EMA) Panel-I (1st January 2003-31st December 2006)

		S&P BSE Auto	S&P BSE Capital Goods
Buy & Hold Return		0.0017	0.0023
Annual buy & hold return		42.5	57.5
Rules			
(5-10)	Mean _B	0.0023 (0.9152)	0.0030 (1.1649)
	Mean _S	0.0004 (-1.0442)	-0.0003 (-1.3421***)
	Buy-Sell	0.0019 (1.1986)	0.0034 (1.3291***)
	Annual Return	47.5	85
	Buy>0	0.6003	0.5869
	Sell>0	0.4517	0.4326
	SD _{Buy}	0.0134	0.0130
	SD _{Sell}	0.0194	0.0263
	N(Buy)	688	794
	N(Sell)	321	215
(5-20)	Mean _B	0.00208 (0.6087)	0.00266 (0.53215)
	Mean _S	0.00073 (-0.74197)	0.00096 (-0.66509)
	Buy-Sell	0.00135 (1.00665)	0.00169 (1.00740)
	Annual Return	33.75	42.25
	Buy>0	0.5935	0.5810
	Sell>0	0.4389	0.4100
	SD _{Buy}	0.01360	0.01339
	SD _{Sell}	0.01947	0.02643
	N(Buy)	706	809
	N(Sell)	303	200
(20-50)	Mean _B	0.00190 (0.32678)	0.00239 (0.11545)
	Mean _S	0.00092 (-0.05505)	0.00169 (-0.2067)
	Buy-Sell	0.00098 (0.93307)	0.00071 (0.66341)
	Annual	24.5	17.75

	Return		
	Buy>0	0.5920	0.5838
	Sell>0	0.4483	0.4259
	SD _{Buy}	0.01449	0.01438
	SD _{Sell}	0.01888	0.03032
	N(Buy)	777	901
	N(Sell)	232	108
(50-200)	Mean _B	0.0168 (-0.0014)	0.00232 (-0.00746)
	Mean _S	0.0169 (0.01118)	0.00279 (0.23994)
	Buy-Sell	-0.000010 (1.03923)	-0.00047 (1.12295)
	Annual Return	-2.5	-11.75
	Buy>0	0.5814	0.5828
	Sell>0	0.3968	0.4167
	SD _{Buy}	0.0159	0.01688
	SD _{Sell}	0.01042	0.00671
	N(Buy)	946	997
	N(Sell)	63	12
Average	N(Buy)	779.25	875.25
	N(Sell)	229.75	133.75
	Buy	0.00577	0.00258
	Sell	0.00474	0.00129
	Buy-Sell	0.00106	0.00158

Source: compiled by the researcher

Table-II depicts the results of exponential moving average (EMA) from 1st January 2003 to 31st December 2006. This shows the average values of buying (selling) returns and aggregate values (buy-sell) with the equivalent t-values in the parenthesis. Standard deviation with buying and selling days is also presented here. The average value of buying (selling) returns of the EMA strategies are presented as under:

It is observed that average buy days are 239.17% and 554.39% more than sell days for Auto and Capital Goods. Standard deviation of selling days is more than buying days in both the sectoral indices which means downtrend is more volatile than uptrend but EMA(50-200) show more volatility in the buying days.

The technical trading tools show predictability if the mean buy (sell) returns are positive (negative) and aggregate values are more than passive strategy. The study represents those long returns are positive for Auto and Capital Goods Index. The returns

from the selling position are not positive for both the sectoral indices which means long positions are more favorable than selling. Out of the EMA strategies 100% (i.e., 8 out of 8) of the EMA rules generate positive buy returns and 12.5% (i.e., 1 out of 8) show positive sell returns. Out of 2 sectoral indices on an average Capital Goods Sector produce more buy (sell) returns than Auto Sector. The bottom part of the table presents those average values of buying (selling) returns across the EMA rules 0.58% (0.47%) for Auto Index, 0.26% (0.13%) for Capital Goods Index are all diverse from the (0.17% and 0.23%) average values of passive strategies.

The study demonstrates that t-values are not statistically significant for both the sectoral indices at any level of significance (1%, 5% and 10%) except 2 cases of EMA (5-10) for Capital Goods Index. But the results on the bases of comparison of average returns of buy (sell) signals with passive strategy show superior returns for Auto Sector and but in case of Capital Goods Index only long

position of technical trading tool is more effective than passive strategy. The study demonstrates that EMA have average prophetic power on the basis of results.

A comparison of the various EMA strategies across the two sectoral indices exposes that (5-10) is more profitable (0.19%, 0.34%) for Auto and Capital Goods Index which shows maximum aggregate average returns (buy-sell) in comparison to other strategies. The average returns (buy-sell) from EMA (5-20) are 0.14% and 0.17% which are less than passive strategy (0.17%, 0.23%) and the aggregate average returns of EMA (20-50) (50-200) are (0.098%, 0.071%, -0.0010% & -0.047%) also less than passive strategy in both the sectoral indices. It is observed that out of four rules the returns of EMA (5-10) are (-1.3421, 1.3291) statistically significant at 10% level of significance for the Capital Goods Index. But as the days of the EMA increase such as 5-20, 20-50 and 50-200 the aggregate average returns reduce. The aggregate value of returns falls from 0.14%, 0.17% to 0.098%, 0.071% and -0.0010%, -0.047% for both the sectoral indices.

The aggregate annual returns of EMA (5-10) (47.5%, 85%) is higher in comparison to (33.75%, 42.25%) EMA 5-20, (24.5%, 17.75%) EMA 20-50 and (-2.5, -11.75) EMA 50-200 for both the sectoral indices during the 1st sub-period (1st January 2003 to 31st March 2006) and the returns of EMA (5-10) is (-1.3421, 1.3291) statistically significant at 10% level of significance for the Capital Goods Index. The aggregate annual returns of EMA (5-10) are (47.5%, 85%) more than (42.5%, 57.5%) passive strategy but the rest of the strategies EMA (5-20), (20-50), (50-200) have less annual aggregate returns in comparison to passive strategy for both the sectoral indices.

On the basis of result, it may be concluded that EMA rules have average prophetic power in forecasting the future price movements for Auto and Capital Goods Index because the average returns are more than passive strategy but the t-values are not statistically significant in most of the cases except EMA(5-10) at any level of significance.

Table-III Standard Test Result of Exponential Moving Average (EMA) Panel-II (1st January 2007-31st December 2010)

		S&P BSE Auto	S&P BSE Capital Goods
Buy & Hold Return		0.0006	0.0005
Annual buy & hold return		15	12.5
Rules			
(5-10)	Mean _B	0.0016 (1.2674)	0.0012 (0.5933)
	Mean _S	-0.0009 (-1.2048)	0.0004 (-0.5954)
	Buy-Sell	0.0025 (1.0803)	0.0016 (0.5451)
	Annual Return	62.5	40
	Buy>0	0.5386	0.5509
	Sell>0	0.4569	0.5024
	SD _{Buy}	0.0154	0.0214
	SD _{Sell}	0.0213	0.0261
	N(Buy)	596	570
	N(Sell)	394	420
(5-20)	Mean _B	0.00157 (1.2164)	0.00202 (1.35522***)
	Mean _S	-0.00098	-0.00148

		(-1.2036)	(-1.30595***)
	Buy-Sell	0.00255 (1.0462)	0.00350 (1.14847)
	Annual Return	63.75	87.5
	Buy>0	0.5393	0.5624
	Sell>0	0.4578	0.5178
	SD _{Buy}	0.01520	0.02090
	SD _{Sell}	0.02183	0.02651
	N(Buy)	623	569
	N(Sell)	367	421
(20-50)	Mean _B	0.00161 (1.20949)	0.00146 (0.90347)
	Mean _S	-0.00089 (-1.20928)	-0.001 (-0.88429)
	Buy-Sell	0.00249 (1.06912)	0.00245 (0.76418)
	Annual Return	62.25	61.25
	Buy>0	0.5433	0.5372
	Sell>0	0.4641	0.4866
	SD _{Buy}	0.01571	0.01989
	SD _{Sell}	0.02092	0.02847
	N(Buy)	600	618
	N(Sell)	390	372
(50-200)	Mean _B	0.00123 (0.6787)	0.00092 (0.43548)
	Mean _S	-0.00018 (-0.72073)	-0.00046 (-0.43987)
	Buy-Sell	0.00141 (0.66352)	0.00139 (0.37579)
	Annual Return	35.25	34.75
	Buy>0	0.5434	0.5499
	Sell>0	0.4635	0.5269
	SD _{Buy}	0.01693	0.01824
	SD _{Sell}	0.01927	0.03338
	N(Buy)	565	711
	N(Sell)	425	279
Average	N(Buy)	596	617
	N(Sell)	394	373
	Buy	0.00125	0.0014
	Sell	-0.00074	-0.00064
	Buy-Sell	0.00224	0.00224

Source: compiled by the researcher

Table-III depicts the results of exponential moving average (EMA) from 1st January 2007 to 31st December 2010. This shows the mean buy (sell) returns and

aggregate average returns (buy-sell) with the equivalent t-values in the parenthesis. Standard deviation with buying and selling days is also presented here. The average value

of returns of buying (selling) signals are presented as under:

It is observed that average buy days are 51.27% and 65.42% more than sell days for Auto and Capital Goods. Standard deviation of selling days is more than buying days in both the sectoral indices which means downtrend is more volatile and short selling is quite risky.

The technical trading tools show predictability if the mean buy(sell) returns are positive (negative) and aggregate average returns are more than buy and hold strategy. The study observed that long returns are positive for Auto and Capital Goods Index which indicates the sound trading in the upward market. The returns from the selling position are positive for both these sectoral indices except Capital Goods Index in case of EMA (5-10) which indicates that short selling is also generate superior returns in the both the sectoral indices. Out of the 8 EMA rules tested for all the indices (2 market indices with 4 EMA rules each), 100% (i.e. 8 out of 8) of the EMA rules generate positive buy returns and 87.5% (i.e. 7 out of 8) show positive sell returns. Out of 2 sectoral indices on an average Auto Sector produce more buy (sell) returns than Capital Goods Sector except the case of EMA (5-20). The bottom part of the table presents that average buy (sell) returns across the four EMA rules 0.13% (-0.074%) for Auto Index, 0.14% (-0.064%) for Capital Goods Index are all different from their respective average buy and hold returns of 0.06% and 0.05%.

The study demonstrates that t-values are not statistically significant for both the sectoral indices at any level of significance (1%, 5% and 10%) except 2 cases of EMA (5-20) for Capital Goods Index. But the results on the bases of comparison of average returns of buy (sell) signals with passive strategy show superior returns for both the Sectors. The results of the study show that

EMA have effective power in forecasting the future price movements.

A comparison of the various EMA strategies across the two sectoral indices exposes that (5-00) is more profitable (0.26%, 0.35%) for Auto and Capital Goods Index which shows maximum aggregate average returns (buy-sell) in comparison to other strategies. The average returns (buy-sell) from EMA (5-20) are 0.26% and 0.35% which are more than buy and hold strategy (0.06%, 0.05%) and the aggregate average returns of EMA (5-10) (20-50) (50-200) are (0.25%, 0.16%, 0.25%, 0.25% & 0.14%, 0.14%) also more than buy and hold strategy in both the sectoral indices. It is observed that out of four rules the returns of EMA (5-20) is (-1.35522, -1.30595) statistically significant at 10% level of significance for the Capital Goods Index. But as the days of the EMA increases such as 20-50 and 50-200 the aggregate average returns reduces ex. (buy-sell) returns falls from 0.25% to 0.14% and 0.25% to 0.14% for both the sectoral indices.

The aggregate annual returns of EMA (5-20) (63.75%, 87.5%) is higher in comparison to (62.5%, 40%) EMA 5-10, (62.25%, 61.25%) EMA 20-50 and (35.25%, 34.75%) EMA 50-200 for both the sectoral indices and the returns of EMA (5-20) is (1.35522%, -1.30595%) statistically significant at 10% level of significance for the Capital Goods Index. The aggregate annual returns of EMA (5-10), EMA (5-20), EMA (20-50) and EMA (50-200) more than (42.5%, 57.5%) buy and hold strategy for both the sectoral indices which means null hypothesis is accepted that technical trading strategies generates superior returns than buy and hold strategy.

On the basis of result, it may be concluded that EMA rules have effective power in forecasting the future price movements for Auto and Capital Goods Index because the average returns are more than passive strategy.

Table-IV Standard Test Result of Exponential Moving Average (EMA) Panel-III (1st January 2011-31st December 2014)

		S&P BSE Auto	S&P BSE Capital Goods
Buy & Hold Return		0.0006	0.00002
Annual buy & hold return		15	0.5
Rules			
(5-10)	Mean _B	0.0008 (0.3922)	0.0009 (0.9660)
	Mean _S	0.0003 (-0.3914)	-0.0008 (-0.9242)
	Buy-Sell	0.0006 (0.4295)	0.0017 (0.8182)
	Annual Return	15	42.5
	Buy>0	0.5621	0.5369
	Sell>0	0.5047	0.5337
	SD _{Buy}	0.0116	0.0164
	SD _{Sell}	0.0138	0.0167
	N(Buy)	564	488
	N(Sell)	428	504
(5-20)	Mean _B	0.00081 (0.34607)	0.00114 (1.2472)
	Mean _S	0.00028 (-0.38003)	-0.001 (-1.1085)
	Buy-Sell	0.00053 (0.4505)	0.00214 (1.0157)
	Annual Return	13.25	53.5
	Buy>0	0.5501	0.5453
	Sell>0	0.4935	0.5360
	SD _{Buy}	0.01147	0.01625
	SD _{Sell}	0.01422	0.01677
	N(Buy)	609	464
	N(Sell)	383	528
(20-50)	Mean _B	0.00051 (-0.15036)	0.00014 (0.15727)
	Mean _S	0.00074 (0.16670)	-0.00013 (-0.14043)
	Buy-Sell	-0.00023 (0.02423)	0.00027 (0.12837)
	Annual Return	-5.75	6.75
	Buy>0	0.5207	0.5132
	Sell>0	0.4473	0.5110
	SD _{Buy}	0.01161	0.01566
	SD _{Sell}	0.01401	0.01740
	N(Buy)	603	493
	N(Sell)	389	499
(50-200)	Mean _B	0.00011	0.00043

		(-0.86195)	(0.49002)
	Means _s	0.00267 (1.79844**)	-0.00025 (-0.28098)
	Buy-Sell	-0.00256 (-0.37429)	0.00068 (0.31046)
	Annual Return	-64	17
	Buy>0	0.5206	0.5134
	Sell>0	0.4136	0.5065
	SD _{Buy}	0.01204	0.01425
	SD _{Sell}	0.01455	0.01781
	N(Buy)	801	374
	N(Sell)	191	618
Average	N(Buy)	644.25	454.75
	N(Sell)	347.75	537.25
	Buy	0.00056	0.00229
	Sell	0.00099	-0.00032
	Buy-Sell	0.00042	0.00120

Source: compiled by the researcher

Table-IV depicts the results of exponential moving average (EMA) from 1st January 2011 to 31st December 2014. This shows the mean buy (sell) returns and aggregate average returns (buy-sell) with the equivalent t-values in the parenthesis. Standard deviation with buying and selling days is also presented here. The average buy (sell) and (buy-sell) returns of the technical tool EMA are presented as under:

It is observed that average buying days are 85.26% more than selling days for Auto Index but in case of Capital Goods Index average number of selling days are 18.14% more than buying days which indicate the downtrend in the market. Standard deviation of selling days are more than buying days in both the sectoral indices which means downtrend is more volatile than uptrend in both the sectoral indices.

The technical trading tools show predictability if the mean buy(sell) returns are positive (negative) and aggregate average returns are more than buy and hold strategy. The study represents that long returns are positive for Auto and Capital Goods Index. The returns from the selling position are positive only for Capital Goods Index which means there is more opportunities of short selling in comparison to Auto Index.

Out of the 8 EMA rules tested for all the indices (2 market indices with 4 EMA

rules each), 100% (i.e. 8 out of 8) of the EMA rules generate positive buy returns and 50% (i.e.4 out of 8) show positive sell returns. Out of 2 sectoral indices on an average Capital Goods Sector produce more buy (sell) returns than Auto Sector. The bottom part of the table presents that average buy (sell) returns across the four EMA rules 0.056% (0.010%) for Auto Index, 0.23% (-0.032%) for Capital Goods Index are all different from their respective average buy and hold returns of 0.06% and 0.002%.

The study demonstrates that t-values are not statistically significant for both the sectoral indices at any level of significance (1%, 5% and 10%) except one case of EMA (50-200) for Auto Index. But the results on the bases of comparison of average returns of buy (sell) signals with passive strategy show superior returns for Capital Goods Sector but in case of Auto Index only long position of technical trading tool is more effective than buy and hold strategy. The results of the study show that EMA have average prophetic power.

A comparison of the various EMA strategies across the two sectoral indices exposes that (5-10) is more profitable (0.06%) for Auto Index but EMA (5-20) produce more return for Capital Goods Index which shows maximum aggregate average returns (buy-sell) in comparison to other strategies. The

average returns (buy-sell) from all the strategies of EMA are more than buy and hold strategy in case of Capital Goods Index but the returns of Auto Index are less than buy and hold strategies. It is observed that out of four rules the returns of EMA (50-200) is (1.79844) statistically significant at 5% level of significance for the Auto Index. But as the days of the EMA increases such as 5-10, 5-20, 20-50 and 50-200 the aggregate average returns reduces ex. (buy-sell) returns falls for both the sectoral indices.

The aggregate annual returns of EMA 5-10 (15%, 42.5%) and EMA 5-20 (13.25%, 53.5%) is higher in comparison to (-5.75%, 6.75%) EMA 20-50 and (-64%, 17%) EMA 50-200 for both the sectoral indices and the t-values of returns in case EMA (50-200) is (1.79844) statistically significant at 5% level of significance for the Auto Index. The aggregate annual returns of EMA 5-10 (15%,

42.5%) are more than (15%, 0.5%) buy and hold strategy and the returns of EMA 5-20 (13.25%, 53.5%) are more than buy and hold strategy in only Capital Goods Index which means that null hypothesis is accepted. But the rest of the strategies such as EMA 20-50 and EMA 50-200 less than buy and hold strategy for both the sectoral indices which means null hypothesis is rejected that technical trading strategies generates superior returns than buy and hold strategy.

On the basis of results, it may be concluded that EMA rules have average prophetic power in forecasting the future price movements for Auto and Capital Goods Index because the average returns are more than passive strategy only in case of Capital Goods Index and the t-values are not statistically significant in most of the cases except EMA(50-200) only in one case.

Table-V Standard Test Result of Exponential Moving Average (EMA) Panel-IV (1st January 2015-31st December 2018)

		S&P BSE Auto	S&P BSE Capital Goods
Buy & Hold Return		0.00013	0.0002
Annual buy & hold return		3.25	5
Rules			
(5-10)	Mean _B	0.00016 (0.1011)	0.00059 (0.6912)
	Mean _S	0.00005 (-0.0833)	-0.00026 (-0.5747)
	Buy-Sell	0.00011 (0.0929)	0.00085 (0.5455)
	Annual Return	2.75	21.25
	Buy>0	0.5440	0.5186
	Sell>0	0.4722	0.5255
	SD _{Buy}	0.0095	0.0105
	SD _{Sell}	0.0136	0.0142
	N(Buy)	557	538
	N(Sell)	432	451
(5-20)	Mean _B	0.00081 (0.34607)	0.00059 (0.6658)
	Mean _S	0.00028 (-0.38003)	-0.00024 (-0.5582)
	Buy-Sell	0.00053 (0.4505)	0.00082 (0.5293)
	Annual Return	13.25	20.5

	Buy>0	0.5402	0.5285
	Sell>0	0.4676	0.5356
	SD _{Buy}	0.01147	0.01074
	SD _{Sell}	0.01422	0.01395
	N(Buy)	609	526
	N(Sell)	383	463
(20-50)	Mean _B	-0.00005 (-0.29026)	0.00026 (0.08769)
	Mean _S	0.00034 (0.31236)	0.00013 (-0.0975)
	Buy-Sell	-0.00039 (-0.2229)	0.00013 (0.11121)
	Annual Return	-9.75	3.25
	Buy>0	0.5412	0.5152
	Sell>0	0.4693	0.5233
	SD _{Buy}	0.01064	0.01198
	SD _{Sell}	0.01255	0.01283
	N(Buy)	582	559
	N(Sell)	407	430
(50-200)	Mean _B	0.00016 (0.09285)	-0.00002 (-0.36867)
	Mean _S	-0.00004 (-0.15952)	0.00061 (0.47540)
	Buy-Sell	0.00019 (0.14052)	-0.00062 (-0.25676)
	Annual Return	4.75	-15.5
	Buy>0	0.5341	0.5109
	Sell>0	0.4546	0.5246
	SD _{Buy}	0.01085	0.01162
	SD _{Sell}	0.01318	0.01362
	N(Buy)	747	644
	N(Sell)	242	345
Average	N(Buy)	623.75	566.75
	N(Sell)	366	422.25
	Buy	0.00027	0.00036
	Sell	0.00016	0.00006
	Buy-Sell	0.00011	0.00030

Source: compiled by the researcher

Table-V depicts the results of exponential moving average (EMA) from 1st January 2015 to 31st December 2018. This shows the mean buy (sell) returns and aggregate average returns (buy-sell) with the equivalent t-values in the parenthesis. Standard deviation with buying and selling days is also presented here. The average buy (sell) and

(buy-sell) returns of the technical tool EMA are presented as under:

It is observed that average buy days are 70.42% and 34.22% more than sell days for Auto and Capital Goods. Standard deviation of selling days are more than buying days in both the sectoral indices which means downtrend is more volatile than uptrend.

The technical trading tools show predictability if the mean buy(sell) returns are positive (negative) and aggregate average returns are more than buy and hold strategy. The study represents that returns from long position are positive for both the indices except in one case of EMA(20-50) and EMA(50-200). The returns from the selling position are positive for both the sectoral indices which means short selling generates more profitable returns. Out of the 8 EMA rules tested for all the indices (2 market indices with 4 EMA rules each), 75% (i.e. 6 out of 8) of the EMA rules generate positive buy returns and 50% (i.e. 4 out of 8) show positive sell returns. Out of 2 sectoral indices on an average Capital Goods Sector produce more buy (sell) returns than Auto Sector except in case of EMA(20-50). The bottom part of the table presents that average buy (sell) returns across the four EMA rules 0.027% (0.016%) for Auto Index, 0.036% (0.006%) for Capital Goods Index are all different from their respective average buy and hold returns of 0.013% and 0.02%.

The study demonstrates that t-values are not statistically significant for both the sectoral indices at any level of significance (1%, 5% and 10%). But the results on the bases of comparison of average returns of buy (sell) signals with passive strategy show superior returns for Capital Goods Sector except in case of EMA(50-200) and but in case of Auto Index returns of technical trading strategy is more than buy and hold strategy except EMA(5-10), (20-50). The results of the study show that EMA have average prophetic power. A comparison of the various EMA strategies across the two sectoral indices exposes that (5-20) is more profitable (0.053%) for Auto Index but EMA(5-10) produce maximum aggregate average returns (buy-sell) for Capital Goods Index in comparison to other strategies. The average returns (buy-sell) from EMA (5-20)

and EMA(50-200) are 0.053% and 0.019% which are more than buy and hold strategy (0.013%, 0.02%) and the aggregate average returns of EMA (5-10) (20-50) are (0.011%, -0.039%) are less than buy and hold strategy in case of Auto Index. But the returns of technical trading strategies EMA (5-10), (5-20) is (0.085%, 0.082%) more than buy and hold strategy. It is observed that out of four rules the returns of EMA strategies are not statistically significant at any level of significance for both the sectoral indices. But as the days of the EMA increases such as 5-10, 5-20, 20-50 and 50-200 the aggregate average returns reduces ex. (buy-sell) returns falls from 0.085%, 0.082% to 0.013%, and -0.062% for Capital Goods Index but in the returns of Auto Sector there is consistency.

The aggregate annual returns of EMA 5-20 (13.25%, 20.5%) is higher in comparison to (-9.75%, 3.25%) EMA 20-50 and (4.75%, 15.5%) EMA 50-200 for both the sectoral indices and the t-values of returns are not statistically significant at any level of significance for both the sectoral indices. The aggregate annual returns of EMA 5-20 (13.25%, 20.5%) are more than (3.25%, 5%) buy and hold strategy and the returns of EMA 5-10 (2.75%, 21.25%) are more than buy and hold strategy in only Capital Goods Index which means that null hypothesis is accepted. But the rest of the strategies such as EMA 20-50 and EMA 50-200 less than buy and hold strategy for both the sectoral indices which means null hypothesis is rejected that technical trading strategies generates superior returns than buy and hold strategy. On the basis of result, it may be concluded that EMA rules have average prophetic power in forecasting the future price movements for Auto and Capital Goods Index because the average returns are more than passive strategy but the t-values are not statistically significant at any level of significance.

Table-VI Standard Test Result of Exponential Moving Average (EMA) Panel-V (1st January 2003-31st December 2018)

		S&P BSE Auto	S&P BSE Capital Goods
Buy & Hold Return		0.00076	0.00077
Annual buy & hold return		19	19.25
Rules			
(5-10)	Mean _B	0.00129 (1.6240***)	0.0016 (2.0631**)
	Mean _S	-0.00006 (-1.604***)	-0.00049 (-2.7025)
	Buy-Sell	0.0014 (1.5985***)	0.0021 (1.9163**)
	Annual Return	35	52.5
	Buy>0	0.5630	0.5527
	Sell>0	0.4730	0.5094
	SD _{Buy}	0.0128	0.01567
	SD _{Sell}	0.0171	0.02047
	N(Buy)	2405	2390
	N(Sell)	1575	1590
(5-20)	Mean _B	0.00119 (1.3350***)	0.00175 (2.4098*)
	Mean _S	0.00002 (-1.3963***)	-0.00066 (-2.3778*)
	Buy-Sell	0.00118 (1.4339***)	0.00241 (2.1749**)
	Annual Return	29.5	60.25
	Buy>0	0.5574	0.5579
	Sell>0	0.4660	0.5155
	SD _{Buy}	0.01275	0.01562
	SD _{Sell}	0.01739	0.02044
	N(Buy)	2510	2368
	N(Sell)	1470	1612
(20-50)	Mean _B	0.00106 (0.89769)	0.00127 (1.2605)
	Mean _S	0.00021 (-1.06765)	-0.00014 (-1.40315***)
	Buy-Sell	0.00086 (1.18361)	0.00141 (1.3639***)
	Annual Return	21.5	35.25
	Buy>0	0.5523	0.5442
	Sell>0	0.4584	0.5018
	SD _{Buy}	0.01339	0.01569
	SD _{Sell}	0.01667	0.02100
	N(Buy)	2562	2571
	N(Sell)	1418	1409

(50-200)	Mean _B	0.00081 (0.1627)	0.00114 (0.94161)
	Mean _S	0.00058 (-0.30488)	-0.00004 (1.1683)
	Buy-Sell	0.00024 (0.82414)	0.00118 (1.17705)
	Annual Return	6	29.5
	Buy>0	0.5469	0.5477
	Sell>0	0.4463	0.5152
	SD _{Buy}	0.01408	0.01586
	SD _{Sell}	0.01641	0.02133
	N(Buy)	3059	2726
	N(Sell)	921	1254
Average	N(Buy)	2634	2513.75
	N(Sell)	1346	1466.25
	Buy	0.00109	0.00144
	Sell	0.00019	-0.00033
	Buy-Sell	0.00092	0.00178

Source: compiled by the researcher

Table-VI depicts the results of exponential moving average (EMA) from 1st January 2003 to 31st December 2018. This shows the mean buy (sell) returns and aggregate average returns (buy-sell) with the equivalent t-values in the parenthesis. Standard deviation with buying and selling days is also presented here. The average buy (sell) and (buy-sell) returns of the technical tool EMA are presented as under:

It is observed that average buy days are 95.69% and 71.44% more than sell days for Auto and Capital Goods. Standard deviation of selling days are more than buying days in both the sectoral indices which means downtrend is more volatile than uptrend.

The technical trading tools show predictability if the mean buy(sell) returns are positive (negative) and aggregate average returns are more than buy and hold strategy. The study represents that long returns are positive for Auto and Capital Goods Index. The returns from the selling position are positive for the Capital Goods Index but in the Auto Index short selling is not positive in all the cases except EMA(5-10). Out of the 8 EMA rules tested for all the indices (2 market indices with 4 EMA rules each), 100% (i.e. 8

out of 8) of the EMA rules generate positive buy returns and 62.5% (i.e. 5 out of 8) show positive sell returns. Out of 2 sectoral indices on an average Capital Goods Sector produce more buy (sell) returns than Auto Sector. The bottom part of the table presents that average buy (sell) returns across the four EMA rules 0.12% (0.02%) for Auto Index, 0.14% (-0.03%) for Capital Goods Index are all different from their respective average buy and hold returns of 0.08% and 0.08%.

The study demonstrates that t-values are statistically significant only EMA(5-10), (5-20) for both the sectoral indices at any level of significance (10%, 5% and 1%) and the returns of EMA(20-50) are significant only for Capital Goods Index. But the results on the bases of comparison of average returns of buy (sell) signals with passive strategy show superior returns for both the sectoral indices in comparison to buy and hold strategy. The results of the study show that EMA have effective power of predicting future price movements.

comparison to other strategies. The average returns (buy-sell) from EMA(5-10), (5-20), (20-50) and (50-200) are (0.14%, 0.21%), (0.12%, 0.24%), (0.086%, 0.14%) and

(0.024%, 0.12%) which are more than buy and hold strategy (0.076%,0.077%). It is observed that out of four rules the returns of all the technical trading strategy are statistically significant at different level of significance for both the sectoral indices. But as the days of the EMA increases such as (5-10), (5-20), (20-50) and (50-200) the aggregate average returns reduce ex. (buy-sell) returns falls from (0.14%, 0.21%) to (0.12%, 0.24%), (0.086%, 0.14%) and (0.024%, 0.12%) for both the sectoral indices.

The aggregate annual returns of EMA 5-10 (35%, 52.5%) and EMA 5-20 (29.5%, 60.25%) is higher in comparison to (21.5%, 35.25%) EMA 20-50 and (6%, 29.5%) EMA 50-200 for both the sectoral indices and the t-values of returns in case EMA (5-10), EMA (5-20) and EMA (20-50) are statistically significant at 1%, 5% and 10% level of significance for both the sectoral indices. The aggregate annual returns of EMA 5-10 (35%, 52.5%), EMA 5-20 (29.5%, 60.25%) and EMA 20-50 (21.5%, 35.25%) are more than (19%, 19.25%) buy and hold

strategy and the returns of EMA 50-200 (6%, 29.5%) are more than buy and hold strategy in only Capital Goods Index which means that null hypothesis is accepted which means that technical trading strategies generates superior returns than buy and hold strategy.

On the basis of result, it may be concluded that EMA rules have effective power in forecasting the future price movements for Auto and Capital Goods Index because the average returns are more than passive strategy and the t-values are also statistically significant in most of the cases except EMA(50-200) at any level of significance.

Sub-Section(c): Risk-Return analysis of Exponential Moving Average (EMA)

This sub-section of the study evaluates the risk-return aspects of technical trading tool (EMA) by computing the gross return, net return, transaction cost, compound annual growth return (CAGR), trade repetition time (in days), number of trades with win/loss trades, Alpha and Sharpe Ratio. These all are presents in the table as under:

Table-VII Risk-Return Analysis of EMA (5-10)

Index	Gross Return (%)	Transaction cost (0.1% of average trade value*number of trade)	Net Return (%) (Gross return – transaction cost)			Trade Repetition Time (In Days)	No. of Trades	Win Trade	Loss Trade	Alpha (Index Return)	Sharpe Ratio (%)
			Aggregate	Aggregate	CA GR						
Panel-I											
S&P BSE Auto	145.081	6.2	138.881	24.32	2	8.008	126	25	101	137.166	556.098
S&P BSE Capital Goods	248.642	5.1	243.542	36.14	1	9.702	104	23	81	241.221	908.106
Panel-II											
S&P BSE Auto	132.893	7.4	125.493	22.54	1	7.226	137	28	109	124.876	436.344
S&P	84.0	7.5	76.53	15.2	2	6.644	149	27	122	76.0	204.

	BSE Capital Goods	36		6	7						41	649
Panel-III												
	S&P BSE Auto	35.2 54	7.4	27.85 4	6.33	2	6.703	148	28	120	27.2 55	136. 806
	S&P BSE Capital Goods	85.2 20	7.1	78.12 0	15.5 3	1	6.937	143	31	112	78.1 19	297. 631
Panel-IV												
	S&P BSE Auto	7.06 2	8.3	-1.239	0.31	2	5.958	166	26	140	- 1.35 0	- 7.45 2
	S&P BSE Capital Goods	43.6 39	6.7	36.93 9	8.18	1	7.381	134	27	107	36.7 41	188. 920
Panel-V												
	S&P BSE Auto	320. 290	29.4	290.8 90	8.89	2	6.898	577	10 7	470	287. 868	1243 .162
	S&P BSE Capital Goods	461. 537	26.5	435.0 37	11.0 5	1	7.509	530	10 8	422	435. 037	1545 .739

Source: compiled by the researcher

Table-VII demonstrates that in the panel-I (1st January 2003-31st December 2006) the net compound annual growth rate (CAGR) ranges between 36.14% (Capital Goods) to 24.32% (Auto). Transaction cost of Auto Index (6.2%) is higher because numbers of transaction are (126) maximum in comparison to Capital Goods sector. Out of total trade (126) win trades are (25) and loss trades are (101) which indicates that technical trading strategies generates more wrong trading signals. 1st ranking has been given to Capital Good Index and the returns of Auto Index are on the 2nd rank. Alpha of Auto and Capital Goods Index is positive in five years which show that returns of portfolio are more than market return. The Sharpe ratio (908.106%) is highest in case of Capital Goods Index which means portfolio returns are more than risk associated with it. In the panel-II (1st January 2007-31st December 2010) net compound annual growth rate of Auto Index (22.5%) is highest and lowest of

Capital Goods Index (15.2%). The Sharpe ratio of Auto Index (436.344%) is maximum and minimum of Capital Goods Index (204.649%) which show that returns of portfolio is more than risk associated with it. Alpha of both the sectors is positive which is the indication of superior returns in comparison to market returns. 1st ranking has been given to Auto Index and the Capital Goods Index is on 2nd on the basis of CAGR. Out of total trades win trades are less in comparison to loss trade which show that technical trading strategies generates more false signals than right. Transaction cost is (7.5) high because number of transactions are (149) high in case of Capital Goods Index. In the panel-III (1st January 2011-31st December 2014) of four years the net compound annual growth rate of Capital Goods sector (15.53%) is maximum and (6.33%) minimum of Auto Sector. 1st ranking has been given to Capital Goods Index and the 2nd ranking to Auto Index based on CAGR. The transaction cost of

AutoIndex (7.4%) is highest because the number of transaction (148) is maximum in comparison to Capital Goods Index. The Sharpe ratio of Capital Goods Index (297.631%) is highest and alpha of both the Index is positive which means portfolio returns are more than market returns. In the panel-VI (1st January 2015-31st December 2018) of four years the net compound annual growth rate of Capital Goods sector (8.18%) is maximum and (0.31%) minimum of Auto Sector. 1st ranking has been given to Capital Goods Index and the 2nd ranking to Auto Index based on CAGR. The transaction cost of Auto Index (8.3%) is highest because the number of transaction (166) is maximum in comparison to Capital Goods Index. The Sharpe ratio of Capital Goods Index (188.920%) is highest and alpha of Capital Goods Index is positive while alpha of Auto

Index is negative which means portfolio returns are more than market returns in case of Capital Goods Index and market returns are less than portfolio return in case of Auto Index. In the panel-V (1st January 2003-31st December 2018) of four years the net compound annual growth rate of Capital Goods Sector (11.05%) is maximum and (8.89%) minimum of Auto Sector. 1st ranking has been given to Capital Goods Index and the 2nd ranking to Auto Index based on CAGR. The transaction cost of Auto Index (29.4%) is highest because the number of transaction (577) is maximum in comparison to Capital Goods Index. The Sharpe ratio of Capital Goods Index (1545.739%) is highest and alpha of both the Index is positive which means portfolio returns are more than market returns.

Table-VIII Risk-Return Analysis of EMA (5-20)

Index	Gross Return (%)	Transaction cost (0.1% of average trade value*number of trade)	Net Return (%) (Gross return – transaction cost)				Trade Repetition Time (In Days)	No. of Trades	Win Trade	Loss Trade	Alpha (Index Return)	Sharpe Ratio (%)
			Aggregate	Aggregate	CA GR	Rank						
Panel-I												
S&P BSE Auto	125.00	4.7	120.30	21.83	2	10.734	94	14	80	118.605	480.848	
S&P BSE Capital Goods	195.90	3.4	192.50	30.78	1	14.838	68	13	55	190.159	716.303	
Panel-II												
S&P BSE Auto	135.820	4.8	131.020	23.28	2	10.42	95	19	76	118.036	415.199	
S&P BSE Capital Goods	177.490	5.3	172.190	28.45	1	9.52	104	19	85	171.665	461.964	

Panel-III												
	S&P BSE Auto	38.5 40	5.2	33.34 0	7.46	2	9.631	103	20	83	32.7 45	164.3 62
	S&P BSE Capita l Goods	105. 750	5.1	100.6 45	19.0 2	1	9.920	100	23	77	100. 643	384.6 07
Panel-IV												
	S&P BSE Auto	- 0.54 4	6.2	-6.744	- 1.73	2	8.107	122	17	105	- 0.65 3	-3.601
	S&P BSE Capita l Goods	41.8 61	5.2	36.66 1	8.12	1	9.696	102	19	83	36.4 63	186.8 83
Panel-V												
	S&P BSE Auto	296. 790	20.9	275.8 90	8.63	2	9.614	414	70	344	272. 865	1177. 987
	S&P BSE Capita l Goods	520. 990	19	501.9 90	11.8 7	1	10.64 2	374	74	300	498. 925	1775. 735

Source: compiled by the researcher

Table-VIII demonstrates that in the panel-I (1st January 2003-31st December 2006) the net compound annual growth rate (CAGR) ranges between 30.78% (Capital Goods) to 21.83% (Auto). Net compound annual growth rate (CAGR) of Capital Goods Index (36.14%) is maximum. Transaction cost of Auto index (4.7%) is higher because numbers of transaction are (94) maximum in comparison to Capital Goods sector. Out of total trade win trades are less in comparison to loss trades which indicates that technical trading strategies generates more wrong trading signals. 1st ranking has been given to Capital Good Index and the returns of Auto Index are on the 2nd rank. Alpha of Auto and Capital Goods Index is positive in five years which show that returns of portfolio are more than market return. The Sharpe ratio (716.303%) is highest in case of Capital Goods Index which means portfolio returns are more than risk associated with it. In the panel-II (1st January 2007-31st December 2010) net compound annual growth rate of Capital Goods Index

(28.4%) is highest and lowest of Capital Goods Index (23.2%). The Sharpe ratio of Capital Goods Index (461.964%) is maximum and minimum of Auto Index (415.199%) which show that returns of portfolio is more than risk associated with it. Alpha of both the sectors is positive which is the indication of superior returns in comparison to market returns. 1st ranking has been given to Capital Goods Index and the Auto Index is on 2nd on the basis of CAGR. Out of total trades win trades are less in comparison to loss trade which show that technical trading strategies generates more false signals than right. Transaction cost is (5.3) high because number of transactions are (104) high in case of Capital Goods Index. In the panel-III (1st January 2011-31st December 2014) of four years the net compound annual growth rate of Capital Goods sector (19.02%) is maximum and (7.46%) minimum of Auto Sector. 1st ranking has been given to Capital Goods Index and the 2nd ranking to Auto Index based on CAGR. The transaction cost of Auto Index

(5.2%) is highest because the number of transaction (103) is maximum in comparison to Capital Goods Index. The Sharpe ratio of Capital Goods Index (384.60%) is highest and alpha of both the Index is positive which means portfolio returns are more than market returns. In the panel-IV (1st January 2015-31st December 2018) of four years the net compound annual growth rate of Capital Goods Sector (8.12%) is maximum and (-1.73%) minimum of Auto Sector. 1st ranking has been given to Capital Goods Index and the 2nd ranking to Auto Index based on CAGR. The transaction cost of Auto Index (6.2%) is highest because the number of transaction (122) is maximum in comparison to Capital Goods Index. The Sharpe ratio of Capital Goods Index (186.883%) is positive and highest while Auto Index has negative ratio which means returns of Capital Goods Index is more than risk associated with it but

the risk level is high than returns in the Auto Sector. Alpha of Capital Goods Index is positive while alpha of Auto Index is negative which means portfolio returns are more than market returns in case of Capital Goods Index and market returns are less than portfolio return in case of Auto Index. In the panel-V (1st January 2003-31st December 2018) of four years the net compound annual growth rate of Capital Goods Sector (11.87%) is maximum and (8.63%) minimum of Auto Sector. 1st ranking has been given to Capital Goods Index and the 2nd ranking to Auto Index based on CAGR. The transaction cost of Auto Index (20.9%) is highest because the number of transaction (414) is maximum in comparison to Capital Goods Index. The Sharpe ratio of Capital Goods Index (1775.735%) is highest and alpha of both the Index is positive which means portfolio returns are more than market returns.

Table-IX Risk-Return Analysis of EMA (20-50)

Index	Gross Return (%)	Transaction cost (0.1%) of average trade value*number of trade)	Net Return (%) (Gross return – transaction cost)				Trade Repetition Time (In Days)	No. of Trades	Win Trade	Loss Trade	Alpha (Index Return)	Sharpe Ratio (%)
			Aggregate	Aggregate	CA GR	Rank						
Panel-I												
S&P BSE Auto	127.00	1.1	125.90	22.6	2	45.86	22	5	17	124.205	503.552	
S&P BSE Capital Goods	198.00	0.7	197.30	31.31	1	72.07	14	4	10	194.959	734.383	
Panel-II												
S&P BSE Auto	131.10	1.5	129.60	23.1	1	35.36	28	8	20	128.986	453.715	
S&P BSE Capital Goods	127.02	1.2	125.82	22.59	2	45.00	22	5	17	125.295	337.207	
Panel-III												
S&P	2.050	1.9	0.150	0.04	2	27.56	36	5	31	-0.449	-2.255	

	BSE Auto												
	S&P BSE Capital Goods	13.380	2.3	11.080	2.66	1	22.55	44	8	36	11.078	42.335	
Panel-IV													
	S&P BSE Auto	-16.810	2.4	-19.210	-5.19	2	21.50	46	5	41	-19.339	-106.726	
	S&P BSE Capital Goods	8.790	2.0	6.790	1.66	1	26.03	38	6	32	6.592	33.759	
Panel-V													
	S&P BSE Auto	242.87	6.9	235.97	7.87	2	30.15	132	23	109	232.945	1005.648	
	S&P BSE Capital Goods	347.13	6.2	340.93	9.72	1	33.73	118	23	95	337.865	1202.503	

Source: compiled by the researcher

Table-IX demonstrates that in the panel-I (1st January 2003-31st December 2006) the net compound annual growth rate (CAGR) ranges between 31.31% (Capital Goods) to 22.6% (Auto). Transaction cost of Auto Index (1.1%) is higher because numbers of transaction are (22) maximum in comparison to Capital Goods Sector. Out of total trade win trades are less than loss trades which indicates that technical trading strategies generates more wrong trading signals. 1st ranking has been given to Capital Good Index and the returns of Auto Index are on the 2nd rank. Alpha of Auto and Capital Goods Index is positive in five years which show that returns of portfolio are more than market return. The Sharpe ratio (734.383%) is highest in case of Capital Goods Index which means portfolio returns are more than risk associated with it. In the panel-II (1st January 2007-31st December 2010) net compound annual growth rate of Auto Index (23.1%) is highest and lowest of Capital Goods Index (22.59%). The Sharpe ratio of Auto Index (453.715%) is maximum and minimum of Capital Goods Index (337.207%) which show that returns of portfolio is more than risk associated with it. Alpha of both the sectors is positive which is the indication of superior returns in

comparison to market returns. 1st ranking has been given to Auto Index and the Capital Goods Index is on 2nd on the basis of CAGR. Out of total trades win trades are less in comparison to loss trade which show that technical trading strategies generates more false signals than right. Transaction cost is (1.5) high because number of transactions are (28) high in case of Auto Index. In the panel-III (1st January 2011-31st December 2014) of four years the net compound annual growth rate of Capital Goods sector (42.335%) is maximum and (-2.255%) minimum of Auto Sector. 1st ranking has been given to Capital Goods Index and the 2nd ranking to Auto Index based on CAGR. The transaction cost of Capital Goods Index (2.3%) is highest because the number of transaction (44) is maximum in comparison to Auto Index. The Sharpe ratio of Capital Goods Index (42.335%) is highest and alpha of the Capital Goods Index is positive which means portfolio returns are more than market returns but the alpha of Auto Index is negative which means market returns are more than index return. In the panel-VI (1st January 2015-31st December 2018) of four years the net compound annual growth rate of Capital Goods sector (1.66%) is maximum and (-

5.19%) minimum of Auto Sector. 1st ranking has been given to Capital Goods Index and the 2nd ranking to Auto Index based on CAGR. The transaction cost of Auto Index (2.4%) is highest because the number of transaction (46) is maximum in comparison to Capital Goods Index. The Sharpe ratio of Capital Goods Index (33.759%) is highest and alpha of Capital Goods Index is positive while alpha of Auto Index is negative which means portfolio returns are more than market returns in case of Capital Goods Index and market returns are less than portfolio return in case of Auto Index. In the panel-V (1st January 2003-31st December 2018) of four years the net compound annual growth rate of

Capital Goods Sector (9.72%) is maximum and (7.87%) minimum of Auto Sector. 1st ranking has been given to Capital Goods Index and the 2nd ranking to Auto Index based on CAGR. The transaction cost of Auto Index (6.9%) is highest because the number of transaction (132) is maximum in comparison to Capital Goods Index. The Sharpe ratio of both the index is positive and the Capital Goods Index has maximum Sharpe ratio (1202.503%) which means that portfolio returns are more than risk associated with it. Alpha of both the Index is positive which means portfolio returns are more than market returns.

Table-X Risk-Return Analysis of EMA (50-200)

Index	Gross Return (%)	Transaction cost (0.1% of average trade value*n number of trade)	Net Return (%) (Gross return – transaction cost)	Trade Repetition Time (In Days)			No. of Trades	Win Trade	Loss Trade	Alpha (Index Return)	Sharpe Ratio (%)
				Aggregate	Aggregate	CA GR					
Panel-I											
S&P BSE Auto	148.00	0.4	147.60	25.44	2	126.13	8	2	6	145.905	591.528
S&P BSE Capital Goods	228.00	0.2	227.80	34.56	1	252.25	4	1	3	225.479	848.843
Panel-II											
S&P BSE Auto	77.21	0.5	76.71	15.3	2	123.75	8	2	6	76.096	267.672
S&P BSE Capital Goods	78.57	0.3	78.27	15.55	1	247.5	4	3	1	77.745	209.236
Panel-III											
S&P BSE Auto	-42.17	1.1	-43.27	-13.21	2	49.60	20	2	18	-43.865	-220.181
S&P BSE Capital Goods	31.65	0.5	31.15	7.01	1	124.0	8	2	6	31.148	119.033

	Goods											
Panel-IV												
	S&P BSE Auto	13.00 5	0.6	12.405	2.97	1	98.9 0	10	2	8	12.27 7	67.75 3
	S&P BSE Capital Goods	- 21.95	0.9	-22.850	- 6.28	2	61.8 1	16	3	13	- 23.04 8	- 118.0 3
Panel-V												
	S&P BSE Auto	195.9 8	2.6	193.38	6.96	2	86.5 2	46	8	38	190.3 55	821.7 83
	S&P BSE Capital Goods	315.9 8	1.9	314.08	9.29	1	124. 38	32	9	23	311.0 15	1106. 941

Source: compiled by the researcher

Table-X demonstrates that in the panel-I (1st January 2003-31st December 2006) the net compound annual growth rate (CAGR) ranges between 34.56% (Capital Goods) to 25.44% (Auto). Transaction cost of Auto index (0.4%) is higher because numbers of transaction are (8) maximum in comparison to Capital Goods sector. Out of total trade win trades are more than loss trades which indicates that technical trading strategies generates more wrong trading signals. 1st ranking has been given to Capital Good Index and the returns of Auto Index are on the 2nd rank. Alpha of Auto and Capital Goods Index is positive in four years which show that returns of portfolio are more than market return. The Sharpe ratio (848.843%) is highest in case of Capital Goods Index which means portfolio returns are more than risk associated with it. In the panel-II (1st January 2007-31st December 2010) net compound annual growth rate of Capital Goods Index (15.55%) is highest and lowest of Auto Index (15.3%). The Sharpe ratio of Auto Index (267.672%) is maximum and minimum of Capital Goods Index (209.236%) which show that returns of portfolio is more than risk associated with it. Alpha of both the sectors is positive which is the indication of superior returns in comparison to market returns. 1st ranking has been given to Capital Goods Index and the Auto Index is on 2nd on the basis of CAGR. Out of total trades win trades are less in comparison to loss trade which

show that technical trading strategies generates more false signals than right. Transaction cost of Auto Index is (0.5) highest because number of transactions are (8) high in comparison to Capital Goods Index.

The panel-III (1st January 2011-31st December 2014) of four years the net compound annual growth rate of Capital Goods sector (7.01%) is maximum and (-13.21%) minimum of Auto Sector. 1st ranking has been given to Capital Goods Index and the 2nd ranking to Auto Index based on CAGR. The transaction cost of Auto Index (1.1%) is highest because the number of transaction (20) is maximum in comparison to Capital Goods Index. The Sharpe ratio of Capital Goods Index (119.033%) is highest and alpha of Capital Goods Index is positive which means Index returns are more than market returns.

In the panel-IV (1st January 2015-31st December 2018) of four years the net compound annual growth rate of Auto Sector (2.97%) is maximum and (-6.28%) minimum of Capital Goods Sector. 1st ranking has been given to Auto Index and the 2nd ranking to Capital Goods Index based on CAGR. The transaction cost of Capital Goods Index (0.9%) is highest because the number of transaction (16) is maximum in comparison to Auto Index. The Sharpe ratio of Auto Index (67.753%) is highest and alpha of Auto Index is positive while alpha of Capital Goods Index is negative which means portfolio

returns are more than market returns in case of Auto Index and market returns are less than portfolio return in case of Capital Goods Index.

In the panel-V (1st January 2003-31st December 2018) of four years the net compound annual growth rate of Capital Goods Sector (9.29%) is maximum and (6.96%) minimum of Auto Sector. 1st ranking has been given to Capital Goods Index and the 2nd ranking to Auto Index based on CAGR. The transaction cost of Auto Index (2.6%) is highest because the number of transaction (46) is maximum in comparison to Capital Goods Index. The Sharpe ratio of Capital Goods Index (1106.941%) is highest and alpha of both the Index is positive which

means portfolio returns are more than market returns and risk associated with it.

Sub-Section (D): Comparison of risk and returns of technical indicators

This sub-section of the study evaluates the risk-return aspects of technical trading strategy exponential moving average (EMA). The performance of different exponential moving average is comparing on the basis of average gross/net return, transaction cost, CAGR, number of trades with win/loss trades, Alpha and Sharpe Ratio. Rank has also been provided on the basis of average compound annual growth rate which are presented in the table as under:

Table-XI: Comparison of Risk and Returns of Technical Indicators

	Index	Gross Return (%)	Transaction cost (0.1% of average trade value*number of trade)	Net Return (%) (Gross return – transaction cost)		Trade Repetition Time (In Days)	No. of Trades	Win Trade	Loss Trade	Alpha (Index Return)	Sharpe Ratio (%)	Rank (Technical Tools)
				Aggregate	Aggregate CAGR							
Panel-I												
EMA (5-10)	S&P BSE Auto	145.081	6.2	138.881	24.32	8.008	126	25	101	137.166	556.098	
	S&P BSE Capital Goods	248.642	5.1	243.542	36.14	9.702	104	23	81	241.221	908.106	
Average		196.862	5.65	191.212	30.23	8.855	115	24	91	189.194	732.102	1
EMA (5-20)	S&P BSE Auto	125.00	4.7	120.30	21.83	10.734	94	14	80	118.605	480.848	
	S&P BSE	195.90	3.4	192.50	30.78	14.838	68	13	55	190.159	716.303	

	Capital Goods											
Average		160.45	4.05	156.4	26.305	12.786	81	13.5	67.5	154.382	598.576	4
EMA (20-50)	S&P BSE Auto	127.00	1.1	125.90	22.6	45.86	22	5	17	124.205	503.552	
	S&P BSE Capital Goods	198.00	0.7	197.30	31.31	72.07	14	4	10	194.959	734.383	
Average		162.5	0.9	161.6	26.955	58.965	18	4.5	13.5	159.582	618.968	3
EMA (50-200)	S&P BSE Auto	148.00	0.4	147.60	25.44	126.13	8	2	6	145.905	591.528	
	S&P BSE Capital Goods	228.00	0.2	227.80	34.56	252.25	4	1	3	225.479	848.843	
Average		188	0.3	187.7	30	189.19	6	1.5	4.5	185.692	720.186	2
Panel-II												
EMA (5-10)	S&P BSE Auto	132.893	7.4	125.493	22.54	7.226	137	28	109	124.876	436.344	
	S&P BSE Capital Goods	84.036	7.5	76.536	15.27	6.644	149	27	122	76.041	204.649	
Average		108.465	7.45	101.015	18.905	6.935	143	27.5	115.5	100.459	320.497	3
EMA (5-20)	S&P BSE Auto	135.820	4.8	131.020	23.28	10.42	95	19	76	118.036	415.199	
	S&P BSE Capital Goods	177.490	5.3	172.190	28.45	9.52	104	19	85	171.665	461.964	
Average		156.655	5.05	151.605	25.865	9.97	99.5	19	80.5	144.851	438.582	1
EMA (20-50)	S&P BSE Auto	131.10	1.5	129.60	23.1	35.36	28	8	20	128.986	453.715	
	S&P BSE Capital Goods	127.02	1.2	125.82	22.59	45.00	22	5	17	125.295	337.207	
Average		129.06	1.35	127.71	22.845	40.18	25	6.5	18.5	127.141	395.461	2
EMA	S&P	77.2	0.5	76.71	15.3	123.7	8	2	6	76.0		

(50-200)	BSE Auto	1				5				96	267.67	
	S&P BSE Capital Goods	78.57	0.3	78.27	15.55	247.5	4	3	1	77.745	209.236	
Average		77.89	0.4	77.49	15.425	185.625	6	2.5	3.5	76.921	238.453	4
Panel-III												
EMA (5-10)	S&P BSE Auto	35.254	7.4	27.854	6.33	6.703	148	28	120	27.255	136.806	
	S&P BSE Capital Goods	85.220	7.1	78.120	15.53	6.937	143	31	112	78.119	297.631	
Average		60.237	7.25	52.987	10.93	6.82	145.5	29.5	116	52.687	217.219	2
EMA (5-20)	S&P BSE Auto	38.540	5.2	33.340	7.46	9.631	103	20	83	32.745	164.362	
	S&P BSE Capital Goods	105.750	5.1	100.645	19.02	9.920	100	23	77	100.643	384.607	
Average		72.145	5.15	66.993	13.24	9.776	101.5	21.5	80	66.694	274.485	1
EMA (20-50)	S&P BSE Auto	2.050	1.9	0.150	0.04	27.56	36	5	31	-0.449	2.255	
	S&P BSE Capital Goods	13.380	2.3	11.080	2.66	22.55	44	8	36	11.078	42.335	
Average		7.715	2.1	5.615	1.35	25.055	40	6.5	33.5	5.315	20.04	3
EMA (50-200)	S&P BSE Auto	42.17	1.1	43.27	13.21	49.60	20	2	18	43.865	220.181	
	S&P BSE Capital Goods	31.65	0.5	31.15	7.01	124.0	8	2	6	31.148	119.033	
Average		-5.26	0.8	-6.06	-3.1	86.8	14	2	12	-6.359	-50.574	4
Panel-IV												
EMA (5-10)	S&P BSE Auto	7.062	8.3	1.239	0.31	5.958	166	26	140	-1.350	7.452	
	S&P	43.6	6.7	36.93	8.18	7.381	134	27	10	36.7	188.	

	BSE Capital Goods	39		9					7	41	920	
Average		25.351	7.5	17.85	4.245	6.670	150	26.5	123.5	17.696	90.734	1
EMA (5-20)	S&P BSE Auto	- 0.54 4		- 6.744	- 1.73				10 5	- 0.65 3	- 3.60 1	
	S&P BSE Capital Goods	41.8 61	5.2	36.66 1	8.12	9.696	102	19	83	36.4 63	186. 883	
Average		20.659	5.7	14.959	3.195	8.902	112	18	94	17.905	91.641	2
EMA (20-50)	S&P BSE Auto	- 16.8 10		- 19.21 0	- 5.19				5 41	- 19.3 39	- 106. 726	
	S&P BSE Capital Goods	8.79 0	2.0	6.790	1.66	26.03	38	6	32	6.59 2	33.7 59	
Average		-4.01	2.2	-6.21	1.765	23.765	42	5.5	36.5	-6.374	-36.484	4
EMA (50-200)	S&P BSE Auto	13.0 05	0.6	12.40 5	2.97	98.90	10	2	8	12.2 77	67.7 53	
	S&P BSE Capital Goods	- 21.9 5	0.9	- 22.85 0	- 6.28		61.81	16	3	13	- 23.0 48	- 118. 03
Average		-4.473	0.75	-5.223	1.655	80.355	13	2.5	10.5	-5.386	-25.139	3
Panel-V												
EMA (5-10)	S&P BSE Auto	320. 290	29.4	290.8 90	8.89	6.898	577	10 7	47 0	287. 868	124 3.16 2	
	S&P BSE Capital Goods	461. 537	26.5	435.0 37	11.0 5	7.509	530	10 8	42 2	435. 037	154 5.73 9	
Average		390.914	27.95	362.964	9.97	7.2035	553.5	107.5	446	361.453	1394.451	2
EMA (5-20)	S&P BSE Auto	296. 790	20.9	275.8 90	8.63	9.614	414	70	34 4	272. 865	7.98 7	
	S&P BSE Capital Goods	520. 990	19	501.9 90	11.8 7	10.64 2	374	74	30 0	498. 925	177 5.73 5	

Average		408.89	19.95	388.94	10.25	10.128	394	72	322	385.895	1476.861	1
EMA (20-50)	S&P BSE Auto	242.87	6.9	235.97	7.87	30.15	132	23	109	232.945	5.648	
	S&P BSE Capital Goods	347.13	6.2	340.93	9.72	33.73	118	23	95	337.865	2.503	
Average		295	6.55	288.45	8.795	31.94	125	23	102	285.405	1104.076	3
EMA (50-200)	S&P BSE Auto	195.98	2.6	193.38	6.96	86.52	46	8	38	190.355	821.783	
	S&P BSE Capital Goods	315.98	1.9	314.08	9.29	124.38	32	9	23	311.015	6.941	
Average		255.98	2.25	253.73	8.125	105.45	39	8.5	30.5	250.685	964.362	4

Source: compiled by the researcher

Table-XI depicts that in the panel-I (1st January 2003-31st December 2006) average net compound annual growth rate (CAGR) ranges between 30.23% (EMA 5-10) to 26.31% (EMA 5-20). Transaction cost in case of EMA 5-10 (5.65%) highest because average numbers of transactions are (115) maximum. The 1st ranking has been given to EMA (5-10) and 4th ranking has been given to EMA (5-20) on the basis of CAGR. The average Sharpe ratio (732.10%) is highest in case of EMA(5-10).

In the panel-II (1st January 2007-31st December 2010) EMA 5-20 (25.865%) produce maximum average net compound annual growth rate and EMA (50-200) (15.425%) has minimum in four years. The average Sharpe ratio (438.582%) in case of EMA(5-20) is highest and lowest of EMA (50-200) (238.453%). Average value of Alpha is positive for all the EMA strategies. The transaction cost of EMA 5-10 (7.45%) is maximum because of maximum number of transactions (143). The 1st ranking has been given to EMA(5-20) and 4th ranking has been given to EMA(50-200) on the basis of CAGR.

In the panel-III (1st January 2011-31st December 2014), the average net compound

annual growth rate in case of EMA 5-20 (13.2%) is highest and (-3.1%) lowest of EMA (50-200). The 1st ranking has been given to EMA (5-20) and 4th ranking has been given to EMA (50-200) on the basis of net compound annual growth rate. The transaction cost in case of EMA(5-10) (7.25%) is maximum because of maximum number of transactions (116). The average Sharpe ratio in case of EMA 5-20 (2089.87%) is maximum. The average value of Alpha of all EMA strategies is positive.

In the panel-IV (1st January 2015-31st December 2018), the average net compound annual growth rate in case of EMA 5-10 (4.25%) is maximum and (-1.77%) minimum of EMA (20-50). The 1st ranking has been given to EMA (5-10) and 4th ranking has been given to EMA (20-50) on the basis of net compound annual growth rate. The transaction cost in case of EMA (5-10) (7.5%) is highest because of maximum number of transactions (150). The average Sharpe ratio in case of EMA 5-20 (91.64%) is maximum. The average value of Alpha of EMA strategies is positive except EMA(20-50) and EMA(50-200).

In the panel-V (1st January 2003-31st December 2018), the average net compound

annual growth rate in case of EMA 5-20 (10.25%) is highest and (8.12%) lowest of EMA (50-200). The 1st ranking has been given to EMA (5-20) and 4th ranking has been given to EMA (50-200) on the basis of net compound annual growth rate. The transaction cost in case of EMA (5-10) (27.95%) is maximum because of maximum number of transactions (553). The average Sharpe ratio in case of EMA 5-20 (1476.86%) is maximum. The average value of Alpha of all EMA strategies is positive.

Overall, on the basis of comparison of average returns of all the EMA strategies in each panel the average net CAGR in case of EMA(5-20) is maximum except the panel-I (1st January 2003-31st December 2006) and panel-IV(1st January 2015-31st December

5. CONCLUSION

The study examined the risk and return of the Bombay Stock Exchange (BSE) Auto and Capital Goods Index using several EMA strategies over a period of sixteen year commencing from January 1, 2003 along with four sub-periods of four years each. The study demonstrates that average returns from long position are positive for all the EMA strategies for both the sectoral indices in all the study periods but the sell returns are positive during the whole sample period (1st January 2003- 31st December 2018) and 2nd sub-period (1st January 2007- 31st December 2010) in all the cases of EMA strategies which means in that period downtrend was also strong. But in other sub-periods short selling give very less positive trading signals only for Capital Goods Index which is a sign that market may be in buying phase and selling signals may be due to the profit booking. Aggregate average returns of the period from 1st January 2007- 31st December 2010 are more than other sub-periods. The aggregate annual return of the different EMA's strategies varies in the different sub-periods. The aggregate annual returns of EMA (5-10), EMA (5-20) and EMA (20-50) are more than buy and hold strategy and the returns of EMA (50-200) are more than buy and hold strategy in only Capital Goods Index which shows that technical trading strategies generates superior

returns than buy and hold strategy. The CAGR of EMA(5-20) is highest for all the indices as compared with other EMA strategies in all most all the study period except 1st sub-period (1st January 2003-31st December 2006) in which EMA (5-10) has highest CAGR. 1st ranking has been given to EMA (5-20) in all most all the study periods for both the sectoral indices except 1st sub-period. EMA (20-50) and EMA (50-200) produce average returns in comparison to buy and hold strategy. The study also observed that in the all-study periods, 1st ranking has been given to Capital Goods Index because the compound annual growth rate is high in comparison to Auto Index. All the study period shows that returns from long position are high than short selling. Transaction cost does not affect the returns of technical tools. The value of alpha is positive in all most all the cases of EMA strategies in all the study period except in some cases of 4th sub-period (1st January 2015-31st December 2018 which means that portfolio returns are more than market returns. Sharpe ratio has highest value in all most all the cases of EMA(5-20) but in some cases EMA(5-10) has highest Sharpe ratio which means portfolio returns are more than risk associated with it. So, on the basis of the results of the study it can be concluded that market players should use multiple combination of exponential moving average (EMA) to earn the higher return than passive investment strategy.

returns than buy and hold strategy. The CAGR of EMA(5-20) is highest for all the indices as compared with other EMA strategies in all most all the study period except 1st sub-period (1st January 2003-31st December 2006) in which EMA (5-10) has highest CAGR. 1st ranking has been given to EMA (5-20) in all most all the study periods for both the sectoral indices except 1st sub-period. EMA (20-50) and EMA (50-200) produce average returns in comparison to buy and hold strategy. The study also observed that in the all-study periods, 1st ranking has been given to Capital Goods Index because the compound annual growth rate is high in comparison to Auto Index. All the study period shows that returns from long position are high than short selling. Transaction cost does not affect the returns of technical tools. The value of alpha is positive in all most all the cases of EMA strategies in all the study period except in some cases of 4th sub-period (1st January 2015-31st December 2018 which means that portfolio returns are more than market returns. Sharpe ratio has highest value in all most all the cases of EMA(5-20) but in some cases EMA(5-10) has highest Sharpe ratio which means portfolio returns are more than risk associated with it. So, on the basis of the results of the study it can be concluded that market players should use multiple combination of exponential moving average (EMA) to earn the higher return than passive investment strategy.

Appendix:

Exponential Moving Average: The present Study uses the EMA(5-10), EMA(5-20), EMA (20-50) and EMA(50-200) crossover strategy, where the 5, 10, 20day EMA was considered as the short moving average and 20, 50, 200day EMA was considered as the long moving average. The computational formula is given below:

$$\text{EMA}_t = \text{Price}_t * K + \text{EMA}(y) * (1 - K) \quad (3)$$

Where t denotes the current day's price, y denotes the previous day's price, $K = 2 / (N + 1)$ and N is number of days. EMA gives extra weightage to current prices because current day's price is more correlated with future price movements which maximizes the possibility of trading profitability. When short runs exponential moving average cut the long run moving average from below the indicator gives the buying signals and when short runs exponential moving average cut the long run moving average from above gives the selling signals.

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DEVELOPMENT OF LOCAL SELF GOVERNMENT IN INDIA: CONSTITUTIONAL PERSPECTIVE

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ABSTRACT

India's history and tradition of democratic institutions have been extensive as well as noteworthy since ancient times. These existing institutions came into existence through the social and political organization of the local habitations. The Panchayats have played a crucial role in the governance of the rural people on a daily basis, and hence even the Constitution of India recognized it. Referring to Article 40 of the constitution, under Directive Principles of State Policy, lays down the duty of the State to take action to set up village panchayats and give to them the powers and authority that may be required to enable them to function as an independent self-governing system within an area with a number of initiatives been taken to strengthen the government at the local level and to improve service levels in urban areas, one of the most important ones among these are the enactment of a set of constitutional provisions, implementation of numerous urban development programs and adoption of various innovative practices. In this paper, the researcher has penned down the development of local self-government in India.

Key Words: local government, village, Gram Panchayats, Directive Principles, Constitutional law

Introduction:

The idea of local Self- authorities emerges from a man's basic urge for liberty, the will to make decisions, and uplift society with respect to the wishes of the respective communities. Local Self- Governments are the ones our bodies that look after the management of a place or a small network such as a village, a town or a town. Local Self-authorities operates at the bottom stage of society. It really works at the grassroots degree, close to the human beings, touching their regular existence. Local Self-government is the administration and running of neighbourhood affairs through such local bodies who have been elected by using the local community. These neighbourhood bodies offer offerings to the area people and acts as an instrument of democratic self-authorities. Local Self- authorities are a shape of the presidency that has no proportion in sovereignty and is, as a result, absolutely subordinate to important authority or, in a federal machine, to kingdom or nearby authority.

In India, villages are always considered as the strength of the country. A village is a type of institution that governs itself, contributing majorly to its growth and development. With the maximum population

living in the rural areas, villages are also called the soul of India, with a population as high as 60% currently residing in rural areas and villages. These villages have a basic governance system called Panchayats.

After independence, local panchayats (councils) were established by most of the state governments in India. Mahatma Gandhi had argued for village self-sufficiency (gram swaraj) to be the aim of independent India but B. R. Ambedkar, the chairman of the Constitution drafting committee, resisted this concept of village panchayats, and only lip service was paid to the concept in the draft of the Constitution. When Gandhi became aware of this, he insisted on the inclusion of the principle of village panchayats, and as a result of his efforts, a provision was included in the Constitution under the Directive Principles of State Policy (Article 40) that gave the powers to the State to take measures to organize Panchayats at the village level and to give them the power, authority & responsibility as may be deemed necessary to enable them to function as a government that governs by self. The Major outbreak in this arena was the consecutive 73rd and 74th Constitutional Amendments that recognized and provided protection to local governments in India officially for the first time.

The structural framework of the amendment has been prepared to keep in view the past experiences of the PRIs and thereafter establishing an effective people's institution. The constitution (73rd and 74th amendment) act, 1992, was inserted in part 9 of the constitution and has added two new parts 9 and 9(A). Thirty-four new articles - 243 to 243ZG & two new schedules viz. schedule 11 and 12 were inserted under these. The amendment played a significant role in giving constitutional recognition to the panchayats and municipalities.

Constitutional provisions-73rd and 74th constitutional amendment 1992

The emergence of the Panchayati Raj came through the 73rd Constitutional Amendment. It was under the leadership of Rajiv Gandhi that this bill got passed in the parliament. While addressing a Workshop on 'Responsive Administration' held at Coimbatore 1988, he said that for the district administration to be responsive, it also has to be sufficiently *represented and thus advertised the importance of the emergence of such systems*. With such fast occurrence & moving of events, Panchayati Raj soon emerged as a major institutional channel of such administration to the country's people.

The difference of treatment between the people who stood for urban local government could be seen clearly with those who stood for the cause of self-government at the grassroots in India ever since independence. Just as the 73rd amendment, the 74th amendment too laid down the mechanism of urban local bodies by providing with mechanisms for their regular, free and fair elections; by giving reservation of seats for SC, ST and OBCs; fixing their term to five years; protecting them against arbitrary dissolution, specifying their powers and responsibilities; and trying to strengthen the fiscal base of the urban local bodies. Apart from these roles, other functions that would not come from the amendment but otherwise include are for providing for nominated members for decentralized planning.

The Constitutional 73rd Amendment Act, 1992 came into effect on 24th April 1993, and it brought in the following constitutional provisions:

The key mandatory provisions include:

1. The establishment of a panchayat (local bodies) in every village, intermediate and at district levels (Article 243B) (except those with populations below 2 million)
2. All seats in the panchayats at all levels to be filled through the conduct of elections (Article 243C)
3. Elections to be conducted in panchayats every five years. If in any case the panchayat gets dissolved prior to its date, then elections must be held again within a span of six months. The newly elected members will serve for the remainder of the five-year term as stated in Article 243E.
4. Seats shall be reserved in all Panchayats at all levels for Dalits and Adivasis in proportion to their population. (Article 243D)
5. One-third of all seats in all panchayats at all levels are reserved for women (Article 243D)
6. The position of panchayat chairperson at the intermediate and district levels to be filled indirectly through elections. (Article 243C)
7. Position of panchayat chairperson to be mandatorily reserved at all levels for Dalits and Adivasis in proportion to their population in the state population (Article 243D)
8. 1/3rd of the positions of panchayat chairperson at all three levels shall be filled only by women candidates (Article 243D)
9. The act also establishes a two level scrutinizing election commission an independent election commission and also the state finance commission to scrutinize the local bodies as well.

The panchayat raj system has had its shares of disadvantages that have also brought criticism for the institution over the years. They conduct broad based activities; however, their resource base is very weak. This is precisely why the Panchayati Raj system did not do well in as many states as was predicted in the beginning. Deficiency in funds and authority is also one of the prime reasons that the local bodies in many states were largely inactive until the late 1970s.

Even with its popularity, this system too has been at the brunt of some major problems and

shortcomings that have adversely affected the functioning of these institutions, these are:

- Irregular conduct of elections;
- Lack of a transfer of powers and resources to the concerned personnel as was required;
- No power to generate their own source of income
- Therepresentation of women and other weaker sections being very less in number compared to the elected bodies despite there being provisions for same.

The Panchayati Raj amendment (a.k.a the 74th) Constitutional Amendment Act, that relates to Municipalities (Urban local Government), was passed by the parliament in 1992. It aimed to provide framework that is common to all, so as to enable them to function as democratic units of local Self Government effectively. The amendment came into force on notified 1st June 1993. Within a year of its enactment, the then existing laws related to the governance were required to come on the same terms with the latest amendment as was mandated by the government.

The major noteworthy provisions of the 74th amendment are as follows:-

1. Forming of Municipalities- 3 types of municipalities have been provided in the constitution depending mainly on the area and size of the land, namely

- 1) From rural to the urban area it is called Nagar Panchayat
- 2) For the smaller urban area, it is known as municipal council and
- 3) For a larger urban area, it is called Municipal Corporation

Other conditions that determine the kind of Municipality differ a great deal from one State to another. Therefore, the decisions and the responsibility of this has been left to the State Legislatures to decide the criteria for deciding as to what kind of Municipality will be constituted for what kind of urban area.

2. Composition of Municipalities- Besides direct elections being held for some seats, special knowledge and experience in municipal administration may be required to fill out for the rest of them. Those nominated persons shall not carry the right to vote in the

municipality meetings. The State legislators also have the representations from the House of People or Legislative Assembly who looks after the local areas.

3. Setting up of Wards Committees- This provides the forming of the Ward Committees in municipalities population of 3 lakhs and above.

4. Seat Reservation -To provide enough representation of minorities and women in the municipal bodies, seats have been reserved for them. The number so reserved shall be the same as the proportion of the population of SC/ST in the municipal area that will be filled by direct reservation only. one-third of the total number of seats shall be compulsorily have to be reserved for minorities & women belonging to SC/ST. This includes reserved seats for women belonging to SC/ST. These reservations will be applicable to direct elections only & is also a mandatory in nature. State Legislatures shall have no restriction in making reservation provisions for seats in the local municipality or Chairperson's office in the municipalities for the upliftment of class of citizens that are backward.

5. Duration of Municipalities- The Municipality has a fixed term of 5 years for the period of

Municipality starting from the appointed date of its first meeting. Elections will be done in the municipality and would be required to be completed before the expiration of the duration of the fixed period. If for any reasons, its gets dissolved before the term of 5 years, in that scenario the elections for constituting a new municipality would be required to be done within 6 months of the dissolution.

6. Powers and Functions provided to the Municipalities- The powers and responsibilities entrusted to the municipalities are given just enough to help them function as an effective institution of self governance and nothing more. The legislature of the state can specify the powers and responsibilities that would be given to the municipalities in respect of preparation of plans for economic development and social justice as well as for implementation of schemes as may be entrusted to them. The Twelfth Schedule of the Constitution provides for a list of

functions that have been given to the municipalities

7. Finances of Municipalities-State Legislature has been given the power to specify matters relating to the imposition of taxes by law. These may include but not be limited to taxes, duties, fees, etc. which could be levied and collected by the local bodies such as the Municipalities as per the procedure by the state. Taxes, duties, fees levied shall be collected by the State Government, and a share will be passed on to the Municipalities. Money for the activities and functions shall be provided to the Municipalities from the State & Constitution of funds for crediting and withdrawing money by the Municipality.

8. Elections to Municipalities- All the election-related matters such as superintendence, direction and control of the preparation of the electoral rolls or their conduct in regard to the panchayats and municipalities shall be done by the State Election Commission.

9. Audit and Accounts- The provisions of the State law shall govern the maintenance of the accounts of the municipalities and other audits. The State Legislatures will freely be able to make appropriate provisions depending on the needs and institutional framework of local people available for this purpose.

10. Committee for District Planning- The Zila Parishad has been given the responsibility and work to plan and allocate resources at the lower level (district) for the Panchayati Raj institutions. In urban areas it is the responsibility of municipal bodies to do these functions within their respective jurisdictions. Some important issues to consider that may arise in concern with the urban-rural interface may be necessary to take an overall view regarding the development of the district as a whole. Deciding the allocation of investments between the rural and urban institutions may also be another important function of the body. Thus, the Planning Committee was set up at the district level to consolidate the already existing plans prepared by the local institutions such as Panchayats and the Municipalities & also to prepare a development plan for the district. The

Committee, while preparing the Draft Plan, shall keep in mind the following:

- a) Those matters are a common interest between the Panchayats and the Municipalities.
- b) The common resources that could be shared
- c) Integrated infrastructure development and conservation of environment
- d) Extent and type of resources available, whether financial or otherwise. The Plan so prepared and recommended by the Planning Committee at the district level shall be forwarded to the State Government by the Chairperson of the Committee.

11. Metropolitan Planning Committees- The Act also provides that a Metropolitan Planning Committee shall prepare the draft development plan in every area (with a population of 10 lakhs or more). The Committee shall take into account a few things while preparing the Draft Development Plan:

- Plan already prepared by the Municipalities and the Panchayats in the metropolitan area
- the areas where there is a common interest between the Municipalities and Panchayats including coordinated spatial plans of the area
- where sharing of natural resources is possible
- Integrated infrastructure development and conservation of environment
- Overall objectives set up by India's government and the Governments of the states
- to what extent are investments likely to be made in the metropolitan area government agencies
- Other available resources, financial and otherwise.

73rd and 74th Constitution Amendments: Given its far-reaching consequences, the 73rd and 74th Amendments have so rightly called 'A Silent Revolution' for various reasons. First of all, the Panchayats be governed by the likes and when of the state governments instead have their own working system. The constitutions gives them enough power to enjoy the status of institutions of self-governance, as parliament at the federal level and legislative assemblies at the state level. One of the main features of elections is that they will be conducted every five years and within six months in case of the dissolution of any

PRI. State election commissions have been set up to ensure fair and free elections. The reservation of women's seats is considered the most major imp change in local bodies, along with the reservation of seats for scheduled castes and scheduled tribes in proportion to their regional populations.

In totality, there are 29 functions to be entrusted to the Panchayati Raj institutions. To maintain an ethical system, popular accountability, and transparency, the amendment emphasised the need for regular gram sabha meetings. These meetings would approve, regulate the continuing of ongoing programmes and financial allocations. In brief, the amendment ensures the distribution of funds, functions, and functionaries to these bodies so as to ensure genuine and effective democratic decentralisation.

Conclusion:

The ethos of democracy can find real nourishment only when power reaches

the grassroots level. For ordinary citizens, local democracy can play a massive role in its functioning, giving them huge value. In such a big country as ours (in terms of populations, area and other factors), where large masses are still unlettered, village panchayats and participative democracy can play a huge role in the daily functioning as well as the governance. Our aim to establish a democratic society, whose base is based on voluntary consent and willing cooperation and not by the force of arms, has been correctly fulfilled by the Panchayati Raj Local Self Government Institutions. In that sense, the 73rd and 74th amendments came as a ripple to the country and have most successfully fulfilled the aims set. They have made a bold attempt to ensure their continuity, stability, representativeness and autonomy to function as valuable systems of self-governance.

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A PHILOSOPHICAL REFLECTION ON GEROTRASCENDENCE IN HUMAN LIFE AND VALUES

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ABSTRACT

In human life, old age is an unavoidable fact. People will experience various levels of transcendence in their lives as they grow older. The ageing process is a multi-faceted phenomenon. People's physical, psychological, and social domains will be affected by the effects of ageing. Though it varies by individual, location, culture, and other factors, the end effect in old age is more or less the same. In old age, there will be both tangible and intangible changes. Will human values alter as a result of changes in human life? Will people's attitudes and perspectives change as they progress through their lives? These are the reasonable questions that must be addressed. Several works in various fields have been done on the theme of old age. In addition, considerable research into the evolution of human values is being done. There isn't a lot of research done in this field of philosophy. As a result, this study focuses on philosophical reflections on ageing and human values concisely.

Keywords: Gerotranscendence, Gerontology, Ageing, Neophobia, Reminiscence, Solitude, Values, Semantic.

Introduction

Ageing is an inevitable reality of life. Gerontology is commonly known as the scientific study of the physical, psychological and social aspects of ageing. (Quadagno, 2014) Old age is a process that every human being born on this planet must go through at some time in their life.

Lars Tornstam proposed the theory of gerotranscendence in 1989. It is a new perspective on ageing (Tornstam, 2005). Gerotranscendence is a natural development process in which humans gradually change their underlying concepts, resulting in a shift in real definition. (Wadensten, 2005) In general, gerotranscendence can be defined as the natural changes or modifications that occur in people as they get older in various aspects of life.

This study aims to determine what changes in human values and lives occur as people age and react to these changes. La Rochefoucauld characterises old age as "There are certain talents or virtues that are required to live properly in old age." (Scarre, 2016).

Changes in Old age

People in their senior years go through several life transitions. Gerontologists have identified four stages of ageing: chronological, biological, psychological, and

social. (Philips, 2010). Thus, the study of old age is a broad field of inquiry.

Tangible changes

Physical, social, psychological, and spiritual changes all occur due to ageing, which occurs continuously from birth until death. (Hunt, 2004). Although ageing is a continuous process, the value of ageing is viewed differently at various stages, especially at the end of their life, visible changes in their life can be observed or experienced.

Chronological ageing

One of the visible changes in life is chronological ageing. The term "chronological ageing" refers to the number of years a person has spent on our planet. The end of life's progression and changes is old age. Many indications are used to assess the later stages of a person's life. One of the most used methods of measurement is chronological age, often known as calendrer age. The chronological age is used to describe old age since it considers specific stages of life (Victor, 1994), such as the ages of legal responsibility, majority, or retirement, and certain types of benefits, such as pension and medical aid.

Biological ageing

There is no biological definition of ageing or the advent of old age that has been widely accepted. Biological ageing manifests itself physiologically at various rates in different persons. The physical and functional changes that occur in an organism over time are known as biological ageing.

Senescence is a phrase that refers to the biological process of growing older. Senescence is the study of decline and death in humans and other living organisms using evolutionary concepts. Senescence causes bodies to react more slowly to changes, making it more difficult to recover from illnesses and injuries. Komp stated that (2013) as people grow older, their health deteriorates, and diseases become more prevalent. Another effect of ageing is a decrease in one's ability to execute daily tasks physically.

Psychological ageing

The psychological study is a scientific study of behaviour and mental processes. Psychology is a branch of science that focuses on the individual. Psychological ageing explains how people develop and change throughout their lives and individual variances in the degree and type of change. Personality, mental function, and the concept of self and identity are all examined using a psychological perspective. (Victor,2005). It also encompasses individual differences in behaviour as well as changes within persons across time.

The goal of psychology is to characterise, predict, explain, and ultimately regulate behaviour, emotion, and cognitive functioning (Clair,2018). Psychological ageing affects Memory, learning, IQ, personality (Chalise, 2019). 'When individuals think about getting older, they not only express anxieties about losing their abilities to think, reason, and remember as well as they previously did, but they are increasingly anxious that these changes will have a substantial impact on all aspects of their lives,' says Wilmoth. (2007). Therefore, psychological ageing can result in a great deal of tension and anxiety later in life.

Social ageing

Age is a social variable and category that defines social roles, conventions, and expectations. (Hoffmann,2008). Changes in roles and connections as we age are referred to as "social ageing." It's not uncommon for older adults to take on new responsibilities, such as becoming grandparents or transitioning from employment to retiree and so on. Society may expect people to act in specific ways as their roles change throughout time. The social age in a specific setting is significant because it influences the Meaning of ageing for that individual, which can make ageing a happy or terrible experience. Ageing, from a sociological standpoint, is a movement from one set of social duties to another. (Prasad,2017)

With ageing, people lose a lot of social connections. The loss of employment hampers their social lives, the deaths of relatives, friends, spouses, and poor health, which prevents them from participating in social activities. Their social lives become confined to interpersonal relationships with family members as the home becomes the focal point of their lives. They are likely to be lonely and alienated due to losing most of the social roles they once had. Though ageing is a stressful time, Hamilton (2011) points out that it is a universal experience; ageing is a sociologically fascinating phenomenon.

Intangible elements

In old age, many tangible and intangible changes occur. Older adults may not notice or express the changes because of the life situation. The following are some of the unseen changes that occur as people get older.

Neophobia

The term neophobia refers to a group of reactions based on the novelty of a stimulus, regardless of its modality. novel items, places, sounds, and other stimulus types might trigger a neophobic response (Reilly,2018).

Neophobia is a phobia that affects the elderly. Older people quit pursuing new things in life because of fear. When elderly individuals are confronted with societal changes, technological advancements, and innovations such as gadgets and other

equipment, they acquire an unreasonable fear of them. This fear will grow stronger as they grow older. They create the belief that they are incapable of dealing with it because of probability.

Reminiscence

The word reminisces is refers to the act or power of recalling old information and the accumulation of personal memories. (Nyatanga,1989).Reminiscing is an activity that often increases in old age.Only when one is old can one have a first-hand perspective of the entire life cycle. (Beaton,1980) Reminiscing is defined as an active process of reminiscing. (Carlson,1984), although nostalgia is most commonly used to express a longing for something from the past.

Reminiscence is used as an emotional release. Everyone reflects on the past. When something remarkable occurs, when friends get together, they may reminisce and relive earlier shared experiences. Reminiscence provides guidance and teaching to newer generations about a world in which older adults typically romanticise the past. The guiding, instructive function of reminiscence will assist folks of worth identification.

Solitude

Social isolation and loneliness are universal public health issues that excessively affect the ageing world population. (Fakoya,2020). Loneliness encompasses a broad range of interconnected and partially overlapping notions. 'Being alone,' 'living alone,' 'aloneness,' 'solitude,' and 'feeling lonely' are some of them.

Emotional and social loneliness are two types of loneliness. The absence of a solid social network and remoteness from any accepted society are associated with social loneliness. Still, emotional loneliness is associated with the absence of a stable attachment figure and a lack of intimate relationships. (Dannefer,2010).

According to Tiwari (2013), A conventional definition is a condition of isolation or being alone; yet, "it is the sensation of being alone and isolated that matters most and is a state of mind". Loneliness can be classified as situational, developmental, or internal.

Re-understanding Values in Old age

Many variables in life cause an older person's values to shift over time. Some of these events occurred due to redefining lives, while others occurred due to realising reality and later transforming into reformed individuals with new perspectives on life.

Redefinition of life

People in their later years will redefine their lives based on a few substances that they used in the past when they were younger. In old age, a fundamental shift is the redefinition of time. The way we perceive time may shift from our usual linear perspective. The impression of time velocity changes as time is redefined. Furthermore, time can be a period of contemplation, renaissance, pattern modifications, and so on. In old age, the concept of time took on an entirely new meaning.

In old age, there are also changes in one's understanding of resources. One of the concepts that older people acquire to handle with value is wealth. In addition, there is a shift from a self-centred to a social centred mentality, the person attempting to become more like wholeness. Moreover, the shift from egoism to altruism has occurred (Jonson,2001).

The conceptions of life and death are likewise changing the ideals of old age. After a lengthy period of ordinary existence, life in old age is assessed based on experiences, accomplishments, and other factors.

Realisation of reality

In old lives, a variety of elements change. These modifications will bring old life's realisation to fruition. Age-related illness is one of the unavoidable changes that occur later in life. Before reaching old age, they will experience biological changes that will cause them to develop age-related illnesses. Due to the distortion of the body, an elderly person's movement will be limited to a smaller circle.

Another significant shift is in one's social standing and relationship. It triggers memories of their previous life, causing them to realise that they are no longer the same person. As a result of this reality, they have shrunk to social selectivity. This reality makes them shrink themselves to social

selectivity. It will apply to their roles, involvement and relationships. Much less energy is spent relating to casual acquaintances and strangers, with a consequent increase in solitude and less emphasis on playing socially accepted roles (Atchely,2008). After retirement, economic flow decreases or stops; people become more vulnerable and dependent. All these realities will make the realisation that there is another role and value in old age life.

In old age, one of the benchmarks can be affinity or appreciating relationships. During this time, the relationship's loneliness grows. Loneliness in life, the dismissal of the younger generation, and individuals in society have contributed to people seeking more board-mind relationships.(Jonson,2001). Furthermore, the transcendence of good and wrong leads to broadness.

Reformative perspective

Though old age makes people's lives more difficult due to numerous inabilities, it gives them a fresh perspective. The fundamental cause for this is the changes that are occurring in their viewpoints. Reformed thinking is always the foundation of reformed perception. There is a conflict between reality and logic in old age. As people get older, they undergo significant life changes that may result from their previous life experiences.

Wisdom is influential for the changed thinking and perspectives. In certain cultures, elders are revered as life's wisdom sources. Many things contributed to this conclusion, including their vast life experiences, the problematic reality they faced, their observations of society, and their legacy. In a nutshell, wisdom arose from the knowledge they gained through various means and the life experiences they had. Hence, the lives of the elderly have an impact on human values.

Semantic understanding

"Old age" refers to the philosophical attachment of wisdom-filled years of life. During this period, people tend to become more rational and logical realisations are common.

Philosophical assessment

On the theme of old age, several philosophers have expressed their opinions. According to Aristotle, old age is the natural

progression of physical and moral degeneration. Plato viewed old age as a great soul purifier. Cicero explains. There exist, and it prevents us from indulging in physically active pursuits, weakens the body, deprives us of physical pleasure, and takes us closer to death (Scarre, 2016,126-130).

What is the philosophical reflection on human values in old age? This is the essential question. It is based on the changes that occur during a person's life. There is a difference between the young and the aged all around the planet. There is a distinction between young and old in many facets of life. In this regard, as a person grows older, their thoughts, approaches, attitudes, and even lifestyles change. Because of their knowledge and experience, they may think about things from a different perspective.

Gerontology philosophy is more than just philosophy; it's also practical knowledge for understanding the essence of humans and applying what's learned to a wide range of themes and challenges pertinent to human life span development. (Perkinson, 2013) This involves human values in the elderly.

The transition from Materialistic to Metaphysical

Our perspectives on life shape our values. Younger generations are naturally more concerned or consumed with material things than intellectual or spiritual topics. Young people believe that they still have a long way to go in life. The emphasis at this point is on obtaining and achieving. Mobility and independence are used to achieve this goal. The explanation is more about the outcome of life than it is about life itself, although acquisitive mentality is a driving force in a young life.

When it comes to older people, this perspective shifts for a variety of reasons. The philosophical notion of the wisdom-filled life is the main point of this change." The gradual onset of old age, as well as the conflict between seeing the elderly as frail, in decline, and sometimes silly, while simultaneously seeing them as repositories of wisdom and experience" (Krotzl,2011) Their unique prior experiences, as well as the long lives they have lived in this world, have caused them to

see things more logically than materialistic perceptions.

Concept of Linear to Transcendental

The time of perception has an impact on values as well. Time is generally regarded linearly by the younger generation. As a result, they live in a different way than older people. Although death has no respect for age, the majority of people die in their golden years. When the lives of the young and the old are compared, the young appear to have many more years before they die. The old, on the other hand, are nearing the end of their lives. Throughout their lives, the young and the old have distinct views on time.

The perception of time may vary from our typical linear view in the last phase of the older generation, as observed: "The perception of time may change from our normal linear view" (Tormstam, 2005). As a result, possessing beliefs and ideals in later life is a unique cause.

Another substantial effect of the linear time notion in both generations is how people think about the afterlife. In comparison to the younger generation, the older generation is more intangible. It also leads to a shift in the elderly's life values.

Perception of Preoccupied to satisfied

Young and older adults's perspectives on the world change over time. Life is distracted in the younger years since there are more duties and busyness. As people grow older, their concerned states fade away and are replaced by a satisfying reality. It is a time

of wisdom and fulfilment to grow old (Laceulle,2013). They get at this life philosophy by reflecting on and revaluing their earlier experiences. A positive outlook on life enhances happiness and fulfilment.

Conclusion

A philosophical perspective on human values and life is an important subject to consider. Many individuals believe that as human beings progress in life, their values will alter. What are the reasons behind this, if that is the case? In their lifetime, humans will undergo several visible and invisible changes. Changes in the physical, emotional, and social domains of life are particularly relevant in this regard. A person's body and mind weaken. Changes in the body impact a person's lifestyle since the mind and body are linked. These changes cause a person to re-evaluate their life and reflect on the beneficial understanding as wisdom.

Is it true that people's values change as they grow older? Yes, because old age is a transitional stage. Both apparent and invisible changes occur in human life. In old age, there arises a difference in the value, existence, and philosophy of life. It focuses on shifting one's outlook on life. As people grow older, it produces changes in their values. Many gerontology studies have been undertaken from biological, psychological, and social perspectives. The philosophical concept of old age has received only a smattering of inquiry. Further research is advisable in this area.

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TO STUDY THE ASSESSMENT OF EMPLOYER, RECRUITER AND HR PERSONNEL REGARDING THE VALUE OF ARTIFICIAL INTELLIGENCE IN RECRUITING PROCESS

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ABSTRACT

Recruitment is a very vital topic for the organization. The time has changed today. Instead of general recruitment, today organization are more focus on different possibilities for accurate talent. Here, Artificial Intelligence play a big role to find out the exact talent according to the job role. Artificial Intelligence precisely focus on right talent for right job. The study investigate the value of artificial intelligence on recruitment. Alongwith the Male and Female regarding the value of artificial intelligence in recruiting process. The study follow Exploratory Research Design. 385 respondents are collected through simple random sampling technique. Self – structured questionnaire are made. The data is not normally distributed, therefore, Descriptive statistics under inferential statistics rank co-relation is applied. Result, descriptive statistic found that mostly respondent like the use of Artificial Intelligence in recruitment process. And recruiting process through Artificial Intelligence male and female both are preferred equally.

Keyword: Recruitment, Artificial Intelligence, Recruiter, Employer.

Introduction:

In 21 century, the online business is get more importance. Digital platform allow millions of buyer and seller in a single market. It is removed the middle man commission. Business is very challenging task. Markets are often changes owing to customer choice and preference. The digital platform offers huge products. So, it is easy to choose the best and suitable product from them for customers. As well as it is a chance for seller to sell their product to millions of customer with a single click. Ever Indian Government promote digitalization today. It generates an open market. Government gives many facilities to the common people to use digitalization.

Artificial Intelligence means an intelligence that made by artificially. Machine with brain.

Machine can take all decision by using their own brain. This is a revolution in Technology. As per the published report of Analytix labs (dated 12ve July, 2020) about the founder of Artificial Intelligence is John McCarthy. In 1955, he invented the term Artificial Intelligence. He is also known as a father of Artificial Intelligence. Artificial intelligence in a most basic terminology and is a human develop intelligent machines. It will work and react like human and its ultimate goal is to facilitate computers to carry out the work as normally done by people. It leads with an incredible speed and accuracy.

Recruitment is a process to get the best candidate for the organization. Every business today search for positive, potential and active employees to handle this digital world to developing business environment. Under the

recruitment policy, the primary jobs for an organization is to hire skilled employees. Only skilled employee can run the organization efficiently and effectively in digital world. The recruitment strategy as it is a major function of organization apparently takes help of data analysis for decision making process. The data analysis is known as “Artificial Intelligence” which plays a crucial role in recruitment decision.

Purpose of the study:

According to Krinitcyna Z.V. and Menshikova E.V. (2014) discrimination found during personnel election process in Russia. The main two factors are social (gender and age) and psychological (racial and religious affiliation, disability). As per Marc Bendick, Jr. and Ana P. Nunes (2012) had conducted their research to control bias in hiring process. Lauren A. Rivera (2012) found that time of hiring decisions employer consider cultural matches between employers and candidates. Biasness in found during choosing candidate for recruitment and selection (Erin Roxburgh and Kate Hansen, 2012). Blind hiring or biases during the hiring process was tried to reduce (Manikandan.S, 2020). SHILIANG TANG et.al, (2017) found that gender bias in job. During employment employer biases is found regarding gender (Carol Isaac et.al. 2009).

The recruitment cost acquired. Cost is limitation for manual recruitment process. Recruitment and Selection cost must be high for experience and specialist personnel. So, research was conducted to cost optimizations for recruitment (Narmadha. M. P and M. R.Vanithamani, 2017). According to Paula M. Gismondiet. al. (2005) cost and time effects on recruitment. So, they conduct a study. As a result the study found that for total 617 successful enrollment cost is \$317,661. And for each enrollment time spend an average of 15 hours. It is found that long time and high cost are associated with recruitment (Shutler, D. et. al. 2006, Gabriella A. et. al., 2014).

From the above discussion it is clearly found that there are so many problems in recruitment process led by human. Therefore, the study include artificial intelligence in recruitment. The study wants to investigate

the value of artificial intelligence in recruitment in the eyes of employer, recruiter and HR personnel.

Reviews of Literature:

Raviprolu, A. (2017) has observed that data play a big role in recruitment. Data helps recruiter to take their decision. AI can interpret and analyses data in very less time compare to human being. This is the important reason to adopt AI In recruiting process. With the help of secondary data the study had investigated the role of AI in recruitment along with technique used in it. As a result the study found that Artificial Intelligence has a role on recruitment. The study had concluded that managers can scale the problem solving skill and managers can measure teamwork as per the industries expert opinion.

Geetha R. and BhanuSree Reddy D (2018) had assess that to run the business in this digital world, a good recruitment strategy and more potential and dynamic employees are needed as per Industries views. The data analysis process is called “Artificial Intelligence”. Data played a vital role in recruitment process. The study investigate the influence of Artificial Intelligence in recruitment. With the help of secondary data the study found that Artificial Intelligence influence on recruitment.

Upadhyay, A. K. and Khandelwal, K. (2018) had examine the application of AI in recruitment. With the help of secondary data the study revealed that the influence of growths in the field of AI on the hiring process for both clients and candidates.

Gupta, P et. al. (2018) had examined that the automation had been selected for recruitment. Measure the tendency of adopting automation in employees planning and recruitment. To handle the challenges regarding recruitment, organization used Artificial Intelligence in it.

Nishad Nawaz (2019) had investigate the role of artificial intelligence in the recruitment process replacing human participation. 138 respondent were collected through structure questionnaire and convenience sampling technique. By descriptive statistics and t test the data were revealed that artificial

intelligence can conduct recruitment without human participation.

Hmoud, B. (2019) had investigated the role of AI in recruitment. The study addressed such questions 1) To what extent the human use AI to hire human? 2) To what extent and how will AI effects recruiters job? 3) What are the organization and managers role in this transformation? The study used secondary data. As a result the study found that AI provide encouraging result for recruiters to improve talent acquisition.

Nawaz, N. (2019) had examined the use of AI in recruitment. Secondary data were used the concluded that AI played a big role in recruitment process.

Choudhury, P. (2020) had examine the role of AI in recruitment policy to take competitive advantage in this digital era. Finally the study concluded that the AI has an impact on recruitment.

Thakur, D. J. and Sharma, S. (2020) had investigated the role of AI in recruitment along with the tools used in the recruitment process. The study concluded that AI reduce

time. Some tools are Mya, Olivia. So, from this article it is found that AI played an important role in recruitment.

Oswal, N. et. al. (2020) had examined the impact AI and its benefits of digital recruitment over traditional recruitment. Conceptual papers, peer-reviewed journals, and websites were used to explain the result. As a result, Ai had search suitable candidates for recruitment process by analyzing data and improve overall recruitment.

Objective

1. To study the value of artificial intelligence in recruiting process.
2. To study opinion of Male and Female regarding the value of artificial intelligence in recruiting process

Research Methodology

Exploratory Research Design. The simple random sampling technique is used to collect respondents. Self– structured questionnaire is used. 28th questions asked in Five point Likert scale, i.e. 1. Strongly disagree, 2. Disagree, 3. Neutral, 4. Agree and 5. Strongly agree. Sample size formula when population is unknown / Cochran formula:

$$n_o = \frac{z^2 \times P \times (1 - P)}{e^2}$$

n = to be calculated

z⁰ = Critical value (95%) = 1.96

e = Margin of error 5% (0.05)

P = Maximum probability of variation in distribution = 50%

Here, sample size of the study is 385.

Result:

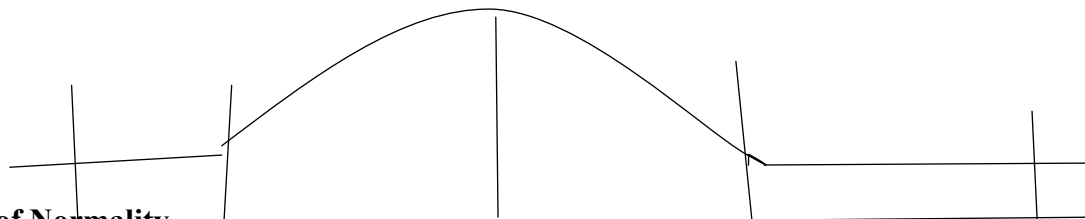
Descriptives

		Statistic	Std. Error	
Air	Mean	105.7636	.20668	
	95% Confidence Interval for Mean	Lower Bound	105.3573	
		Upper Bound	106.1700	
	5% Trimmed Mean	106.0938		
	Median	106.0000		
	Variance	16.447		
	Std. Deviation	4.05544		
	Minimum	74.00		
	Maximum	118.00		

Range	44.00	
Interquartile Range	.00	
Skewness	-2.908	.124
Kurtosis	16.611	.248

From the above table, it is found that Skewness statistics value -2.908 and Standard Error value .124
 $-2.908 / .124 = -23.451$
 From the above table, it is found that Kurtosis statistics value 16.611 and Standard Error value .248

$16.611 / .248 = 66.979$
 Skewness value 23.451 which is greater than 0.05 (5% = +1.96).
 Kurtosis value is 66.979 which is greater than 0.05 (5% = +1.96).



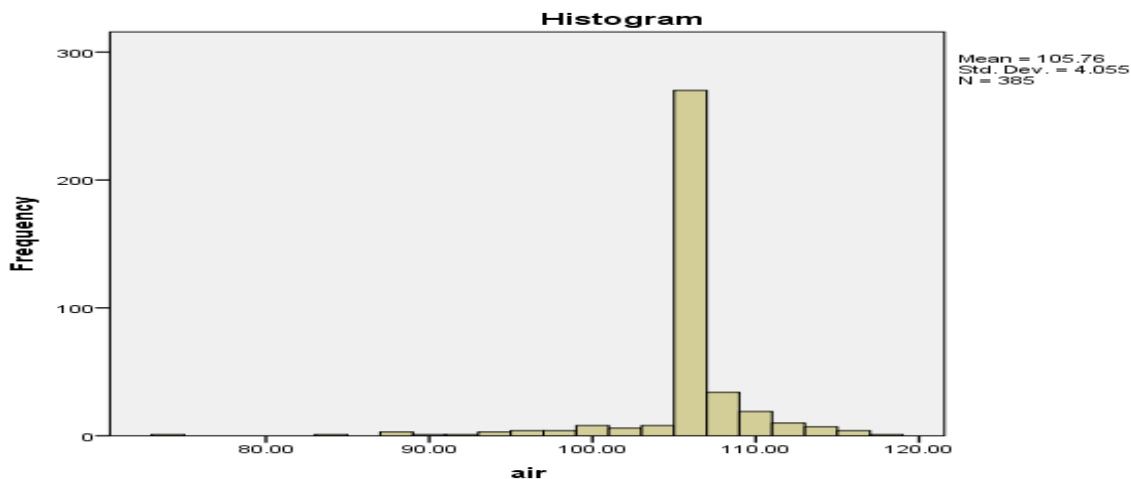
Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Air	.401	385	.000	.600	385	.000

a. Lilliefors Significance Correction

From the above table, it is found that here, P value or Sig. value is .000 which is less than

0.05. Therefore, the Data is not normally distributed.



From the above histogram that it is clear that the data are not normally distributed.

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Use of technologies in recruitment process isright	385	3	2	5	4.13	.364

Traditional recruitment is a time consuming process	385	4	1	5	3.98	.374
Traditional recruitment is expensive	385	4	1	5	4.05	.444
Biasness in traditional recruitment process	385	4	1	5	3.80	.657
Data analytics or artificial intelligence in recruitment process	385	4	1	5	3.89	.481
Artificial intelligence could influence on screening like human	385	4	1	5	4.02	.371
Artificial intelligence could influence on engagement like human	385	4	1	5	3.97	.410
Artificial intelligence could influence on employee relation like human	385	4	1	5	3.87	.537
Artificial intelligence could influence on career development	385	4	1	5	3.87	.539
Artificial intelligence could influence on orientation of new hiring	385	4	1	5	3.86	.436
Artificial intelligence could influence on Re-engagement like human	385	4	1	5	3.97	.370
Artificial intelligence could influence on post offer acceptance like traditional recruitment	385	4	1	5	3.90	.437
Artificial intelligence could influence on adapt training and development	385	4	1	5	3.74	.688
Application of Artificial intelligence is risky for recruitment process	385	4	1	5	2.12	.535
Artificial intelligence based decision making is reliable	385	2	3	5	4.15	.391
Artificial intelligence and data analytic operations effect equal opportunities for applicants	385	2	3	5	4.03	.273

Artificial intelligence is better than traditional recruitment	385	3	2	5	4.01	.430
Artificial intelligence can applicable on large scale of recruitment process only	385	3	2	5	3.95	.393
Automation process is good	385	3	2	5	4.16	.417
Artificial intelligence save time in recruitment	385	2	3	5	4.05	.275
Artificial intelligence reduce recruitment cost	385	3	2	5	4.04	.366
Artificial intelligence hire with quality	385	3	2	5	4.02	.314
Mapping talents	385	3	2	5	4.03	.330
Traditional recruitment is better than Artificial intelligence	385	4	1	5	2.07	.526
Query redressing	385	3	2	5	3.95	.346
Artificial intelligence not select worth candidates	385	4	1	5	2.01	.427
Artificial intelligence could scheduling like manual recruitment	385	3	2	5	4.00	.339
Artificial intelligence could done data analysis	385	1	4	5	4.11	.315
Valid N (listwise)	385					

From the above descriptive statistic table, it is found that mostly respondent like the use of Artificial Intelligence in recruitment process. Mean scores are near about 4 and above. Respondents did not agree that traditional recruitment process is better than Artificial

Intelligence in recruitment. Respondents shows their negative response against the use of Artificial intelligence is not select worth candidates. That means Artificial intelligence select valuable candidates.

Ranks

	Gender	N	Mean Rank	Sum of Ranks
air	Male	240	194.38	46650.50
	Female	145	190.72	27654.50
	Total	385		

Mean rank of Male and Female is difference. Male means rank is 194.38 and Female mean rank is 190.72.

Test Statistics^a

	air
Mann-Whitney U	17069.50 0
Wilcoxon W	27654.50 0
Z	-.379
Asymp. Sig. (2-tailed)	.705

a. Grouping Variable: Gender

From the above table it is clear that P value is greater than 0.05. Therefore, we failed to reject the null hypothesis. As a result, the

study reveal that in recruiting process through Artificial Intelligence both are like equally.

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DISTRIBUTION AND SEASONAL VARIATION OF HEAVY METAL CONTAMINATION IN SURFACE WATER AND SEDIMENT OF THE DUDHNADI RIVER AROUND KANKER CITY IN CHHATTISGARH, INDIA

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ABSTRACT

Water is one of the most important components of existing organism, which is the natural source of the river. Rivers are the life line of any country and it supports a large volume of population since long time. The assessment of water quality of Dudhnadi River becoming important because of various reasons towards pollution due to the disposal of domestic, agriculture effluents and several developmental activities. In the present work, of Dudhnadi river water and sediments samples from Kanker City area were analysed for various parameters and heavy metals concentration indicative of pollution level. Physico-chemical properties like pH, Turbidity, Conductivity, TDS, DO, BOD, COD were analysed in river water samples and determine heavy metals concentration of river water and sediments samples. The order of average concentration of heavy metals in river water $Zn > Cr > Fe > Sn > As > Cu > Cd > Pb > Co > Ni > Mn$, and order of heavy metals average concentration in river sediments $Fe > Mn > Zn > Ni > Cr > Cu > Co > Pb > As > Sn > Cd$. The calculating using pollution indices as Contamination Factor (CF), Contamination Degree (CD), Pollution Lode Index (PLI), Enrichment Factor (EF) and geo-accumulation Index (I_{geo}), in this study provides the first and useful data for the geochemistry of the Dudhnadi river sediments.

Keywords: Physico-chemical parameters, Assessment, Water Pollution, Concentration Heavy metals

1. Introduction

River water is an important natural source and essential for life of all living organisms. River water pollution, which is a major environmental issue in India as well as whole world, is the introduction of contaminating pollutions into the river water leading to an adverse change. The decline of river water quality day by day because of indiscriminately untreated sewage discharge, industrial waste discharge, and other anthropogenic activities such as urbanization, population growths, agriculture discharge, land development and natural process like soil erosion, leaching of minerals along with river basin is one of the major concerns. Almost, 85% of the river's pollution comes from domestic sources (CWC, 2007). Most of the rivers following the residential area are final discharge point for effluent from industrial area and municipal waste (Moscow et al., 2011). The calculative changes in physicochemical parameter of river water such as pH, TDS, turbidity, DO, BOD, COD have been observed specially in the concentration of heavy metals which cause

changes in the physical properties of water, such as colour, odour etc. Including both essential and non-essential Heavy metals have a particular significance in ecotoxicology, since they are highly determined and all have the potential to be toxic to living organisms (Storelli et al. 2005). Monitoring of heavy metal concentration is very important because of their toxicity and their bioaccumulation in living organisms (Miller et al., 2002). Heavy metals inputs may be in particulate matter or dissolved form, and most of the heavy metals tend to accumulate in sediments (Azadeh Taghinia Hejabi et al. 2011). Sorption and desorption both are controlled by the nature of the total heavy metal load in sediment and the surface water characteristics (Todorovic et al. 2001). Contamination of Heavy metals in river water and sediments becomes the major quality problems in fast developing cities, since water and sediment quality maintenance and hygiene structure do not grow along with population and urbanization (Ahmad et al. 2010). Presence of heavy metals in river system in both particle and dissolved state, the particle form gets

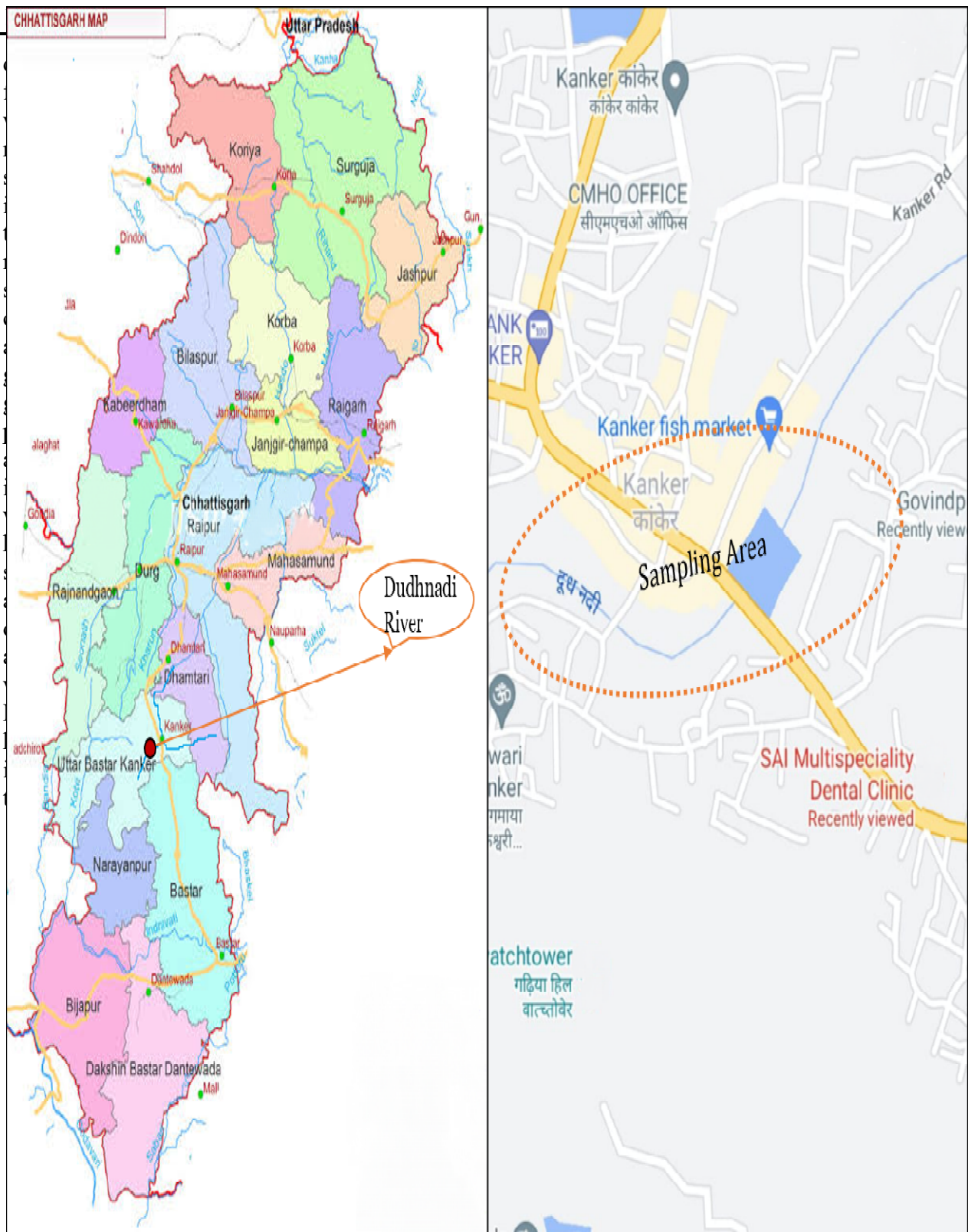


Fig. 1:Location of the study area and sampling sites along with the Dudhnadi River, Chhattisgarh, India.

2.2 Collection of Water Sample

For the water sampling of Dudhnadi River in Kanker area, randomly locations were fixed along the stretch falling under the rural, agriculture and urban areas, depending upon the site conditions. Characterization is done by water sample collection and analysed

for physicochemical parameters, like pH, Electrical Conductivity (EC), Total dissolved solid (TDS), Turbidity, Dissolved oxygen, Chemical oxygen demand, Biochemical oxygen demand, and heavy metal concentration. During the testing procedure sample were kept in normal room temperature.

2.3 Collection of Sediment Sample

The sediment samples were collected from 5 to 10 cm depth of the middle of the river or the bank of the running water channel. The sediment samples were collected in impenetrable polythene sacks as 250 gm for each situation with the help of plastic scoop during study period. Sediment samples were collected for three seasons' viz. monsoon, winter, summer in the year of 2018-2019. Collected sample were air-dried at room temperature, homogenized, and sieved using a 2-mm mesh sieve. Testing

Table 1: Used method and associated instrumentation for analysis of river water and sediments.

S. No.	Parameters	Method used	Unit of Measurement	References
1.	pH	pH Meter	pH Scale	Kumar Deepak et al. (2017), Rachit Kashyap et al. (2016), Sonam Shukla et al. (2015)
2.	Conductivity	Conductivity Meter	$\mu\text{S}/\text{cm}$	Kumar Deepak et al. (2017), Rachit Kashyap et al. (2016), Sonam Shukla et al. (2015)
3.	TDS	TDS Meter	mg/L	Kumar Deepak et al. (2017), Rachit Kashyap et al. (2016), Sonam Shukla et al. (2015)
4.	Turbidity	Turbidity meter	N.T.U.	Kumar Deepak et al. (2017), Rachit Kashyap et al. (2016), Sonam Shukla et al. (2015)
5.	DO	Titrimetric Method	mg/L	Kumar Deepak et al. (2017), Rachit Kashyap et al. (2016), Sonam Shukla et al. (2015)
6.	BOD	Dilution Method	mg/L	Kumar Deepak et al. (2017), Rachit Kashyap et al. (2016), Sonam Shukla et al. (2015)
7.	COD	Titrimetric Method	mg/L	Kumar Deepak et al. (2017), Rachit Kashyap et al. (2016), Sonam Shukla et al. (2015)
8.	Heavy metals water and sediments samples	Thermo scientific ICE 3000 series AAS Spectrophotometer	mg/L and mg/kg	Harendra Singh et al. (2016)

RESULTS AND DISCUSSION

(A) Seasonal and spatial variations of Physico-chemical parameters and heavy metal levels in surface water samples of Dudhnadi river

My studies on seasonal variation of the physicochemical parameter of river water

instruments were washed with double-distilled water and dried before use.

2.4 Analysis of Physico-chemical Characteristic and Heavy Metal

The methods for all parameters were followed as per APHA, (2012). The parameters pH was analysed on site, while other parameters i.e. Electric conductivity, TDS, Turbidity, DO, BOD, COD, were analysed in laboratory as per APHA, (2012) and Heavy metals were analysed by using Thermo scientific ICE 3000 series AAS Spectrophotometer.

sample is in Dudhnadi River more as comparison WHO permissible limits (Table 2). It is apparent from the results that the average assessment of physicochemical parameter varies significantly

Table 2: Average value of physicochemical parameter in Dudhnadi river water.

S. No.	Physicochemical parameters	Dudhnadi river				WHO Permissible limits
		Monsoon	Winter	Summer	Total Average	
1.	pH	7.55±0.21	7.66±0.62	7.56±0.50	7.59	6.5-8.5
2.	Conductivity($\mu\text{S/cm}$)	157.28±12.6	274.45±13.91	615.93±8.98	349.22	750
3.	TDS (mg/L)	97.07±13.74	172.79±14.12	330.52±12.58	200.12	500
4.	Turbidity (N.T.U.)	35.44±34.25	3.73±1.29	7.47±3.22	15.55	5
5.	DO (mg/L)	9.77±1.55	9.78±1.55	9.49±1.94	9.68	4-6
6.	BOD (mg/L)	19.08±8.96	16.99±8.99	28.33±6.72	21.47	2
7.	COD (mg/L)	24.17±9.77	28.83±6.72	31.50±5.99	28.17	-

pH values ranged of Dudhnadi River water from 7.55 to 7.66 and total average pH values as showed 7.59 (Table 2). However, pH value of three seasons is considered, it was found also to be slightly alkaline, the maximum pH value of Dudhnadi river water was winter season and minimum pH value was monsoon season (Fig. 2). EC values ranged of Dudhnadi River water from 157.28 $\mu\text{S/cm}$ to 615.93 $\mu\text{S/cm}$ and total average EC values was showed in 349.22 (Table 2). The maximum EC value of Dudhnadi River water was found at summer season then minimum EC value was found monsoon season (Fig. 3). TDS values ranged of Dudhnadi River water from 97.07 mg/L to 330.52 mg/L and total average TDS values was showed 200.12 (Table 2). The maximum TDS value of Dudhnadi River water was found at summer season then minimum TDS value was found monsoon season (Fig. 3). Turbidity ranged of Dudhnadi River water from 3.73 N.T.U. to 35.44 N.T.U. and total average Turbidity values was showed 15.55 N.T.U. which is higher the permissible limit (Table 2). The maximum Turbidity of Dudhnadi River water was found at monsoon

season and higher the permissible limit (35.44 N.T.U.) then Turbidity was found summer season also higher the permissible limit (7.47 N.T.U.) then minimum Turbidity was found winter season (Fig. 2). The ranged of dissolve oxygen in Dudhnadi river water from 9.49 mg/L to 9.78 mg/L and total average DO values was showed 9.68 mg/L (Table 2). The maximum DO of Dudhnadi River water was found at winter season and minimum DO was found summer season (Fig. 2). The ranged of Biological Oxygen Demand in Dudhnadi river water from 16.99 mg/L to as 28.33 mg/L and total average BOD values was showed 21.47 mg/L (Table 2). The maximum BOD of Dudhnadi River water was found at summer season and minimum BOD was found winter season (Fig. 2). The ranged of Chemical oxygen demand in Dudhnadi river water from 24.17 mg/L to as 31.50 mg/L and total average COD values was showed 28.17 mg/L (Table 2). The maximum COD of Dudhnadi River water was found at summer season and minimum COD was found monsoon season (Fig. 2). In all three seasons, the value of BOD and COD both parameter higher than the permissible limit.

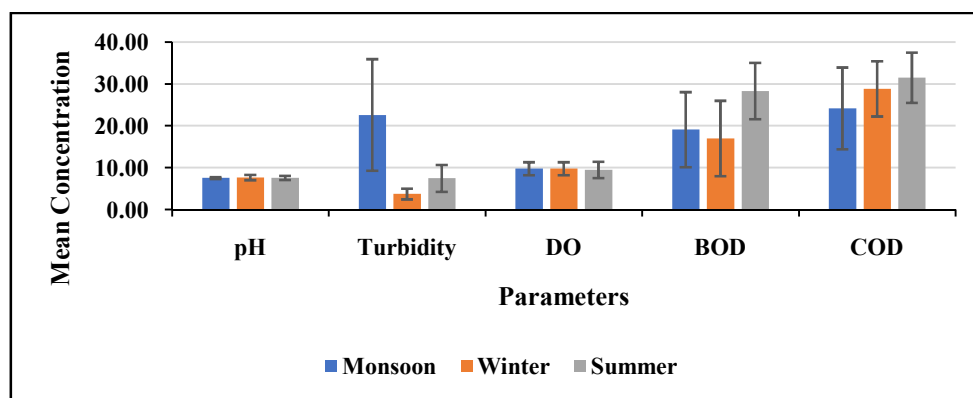


Fig. 2: Graph showing mean concentrations of pH, Turbidity (N.T.U.), DO, BOD & COD (mg/L) in water samples of the river Dudhnadi during three seasons.

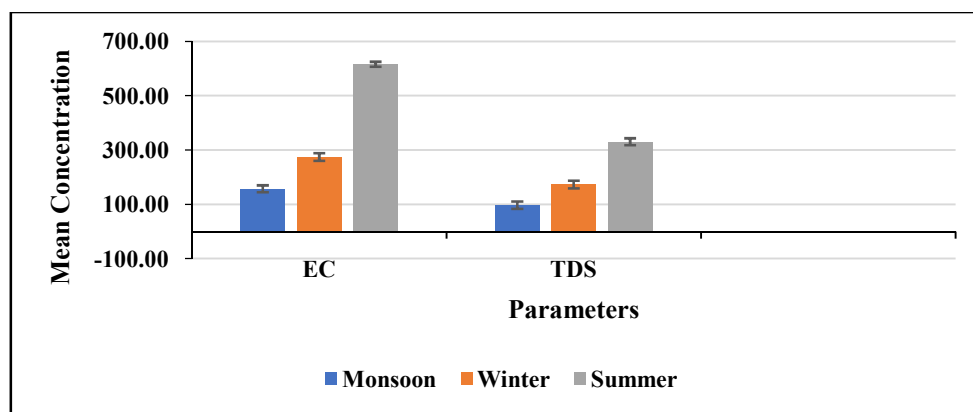


Fig. 3: Graph showing mean concentrations of Electrical Conductivity ($\mu\text{S}/\text{cm}$) & TDS (mg/L) in water samples of the river Dudhnadi during three seasons.

Table 3. Comparison of average concentration (mg/L) of heavy metals present in water sample of Dudhnadi River with other studies.

Heavy metals (mg/L)	Cd	Pb	Cu	Cr	Zn	As	Co	Ni	Mn	Fe	References
Dudhnadi river	0.0224	0.1755	0.2496	0.7705	1.2452	0.3911	0.1743	0.1723	0.0751	0.4524	Present study
Harikewetland a	0.02	0.72	0.17	0.098	0.55	-	0.021	0.035	0.103	-	Kumar et al. (2018)
Beas rivera	0.005	0.081	0.004	0.031	0.22	-	0.012	-	0.37	-	Kumar et al. (2018)
Kali River Western (India)	0.06	0.13	-	0.06	24.71	-	-	-	-	-	Mishra et al. (2017)
River Ganga (India)	0.021	0.095	0.031	0.050	0.050	-	-	0.040	0.049	-	Pandey et al. (2015)
Tianshan mountains (China)	0.0039	0.031	0.08	0.046	0.361	-	0.087	0.021	0.87	-	Zhaoyong et al. (2015)
Tigris River (Turkey)	0.0001	0.0003	0.032	0.005	0.001	-	0.015	0.045	0.388	-	Varol and S, en (2012)
River Soan (Pakistan)	BDL	0.65	0.02	0.01	0.015	-	0.02	BDL	0.04	-	Nazeer et al. (2014)
Bogacayi River (Turkey)	0.027	0.027	0.099	0.011	-	-	0.010	0.053	0.051	-	Cengiz et al. (2017)
Yamuna river	0.0047	0.1164	2.1518	.01471	1.500	-	-	.03755	-	10.48	RichaBhardwaj et al. (2017)
Bogacayi river (Turkey)	0.027	0.027	0.099	0.016	-	0.0499	0.010	0.053	0.051	-	Mehmet FatihCengiz et al. (2017)

Order of heavy metal concentration in Dudhnadi river Zn > Cr > Fe > Sn > As > Cu > Cd > Pb > Co > Ni > Mn. The concentration of Zn in river water sample higher the other heavy metal in all three seasons but concentration of Zn under the permissible limit (5mg/L) and concentration of Mn lower the other heavy metal in all three season and concentration of Mn under the permissible limit (0.1mg/L). The concentration of Cr, Cu, below the permissible limit but concentration of Fe is higher the permissible limit in monsoon and summer seasons but concentration of Pb, As, Cd, Co, Ni and Sn, higher the permissible limit (0.05mg/L,

0.05mg/L, 0.005mg/L, 0.04mg/L, 0.02mg/L, and 0.1mg/L respectively) in all the three season Fig. 4. The maximum concentration of Cu, Pb, Mn, Sn, As, and Fe in summer season and minimum concentration of winter season, concentration of maximum in Ni and Cr in summer season and minimum concentration is monsoon season the concentration of Zn is maximum in winter season and minimum is monsoon season and concentration of Cd is maximum winter season and equal as monsoon season and minimum is summer season, and concentration of Co maximum in monsoon and minimum is winter season.

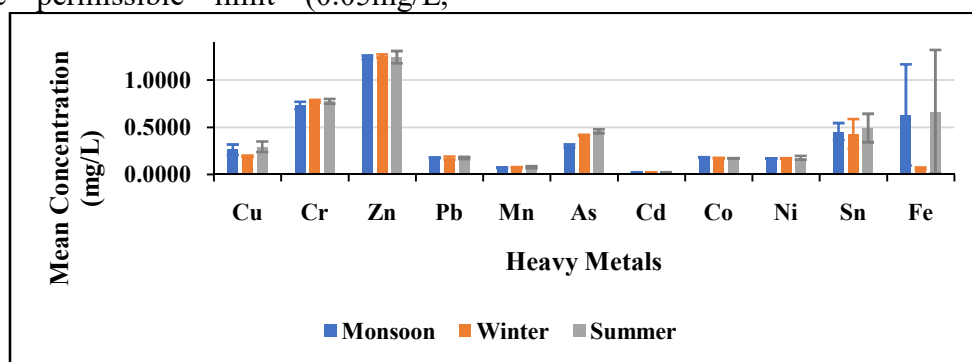


Fig. 4: Graph showing mean concentrations (mg/L) of heavy metals in water of the river Dudhnadi during three seasons.

Water quality index (WQI)

Surface water quality decline has become a serious and worldwide problem due to increased pollution and climate change (John et. al 2014). For the purpose of present investigation, six physico-chemical parameters and eleven toxic metals have been selected. These six physico-chemical parameters are pH, Electrical Conductivity, Total Dissolved Solids, Turbidity, Dissolved

Oxygen, Bio-chemical Oxygen Demand, and toxic metals such as Copper, Chromium, Zinc, lead, Manganese, Arsenic Cadmium, Cobalt, Nickel, Tin and Iron. Calculation of WQI in case of river water samples.

WQI Formula

Step 1. Calculation the unit weights (Wn) factors for each parameter by using the formula

$$W_n = \frac{K}{S_n}$$

Where,

S_n is the standard permissible value for the nth water quality parameter.

K is the constant of proportionality and it is calculated using the equation

$$K = \frac{1}{\frac{1}{S_1} + \frac{1}{S_2} + \frac{1}{S_3} + \dots + \frac{1}{S_n}} = \frac{1}{\sum \frac{1}{S_n}}$$

Q_n summation of all selected parameters unit weights factors W_n = 1 (unity)

Step 2. The quality rating Q_n is calculated using the equation

$$Q_n = \frac{(V_n - V_i)}{(S_n - V_i)} \times 100$$

Where,

V_n is the actual value of the parameter observed;

V_i represents the ideal value of that parameter [$V_i = 0$, except for pH ($V_i = 7$) and DO ($V_i = 14.6$ mg/l)] and S_n is the standard permissible value.

Step 3. Combining step 1 and step 2 WQI calculate as follow:

$$\text{Overall WQI} = \frac{\sum W_n Q_n}{\sum W_n}$$

The water quality status (WQS) according to WQI is shown in Table.

Table 4. WQI range and status of the water sample.

WQI	Water quality status
0-25	Excellent
26-50	Good
76-100	Very poor
Above 100	Unsuitable for drinking use

Water quality analysis

First of all, unit weight for each parameter is estimated to a common scale. Standard value of drinking water quality and the unit weights assigned to each parameter used for calculating the WQI is shown on Table 5.1. Maximum weight is provided to EC (3.8039) and TDS (5.7058), suggesting the significance and impact of these two parameters in water quality

index (Debnath Palit, et al. 2018). WQI values of the water samples from Dudhnadi river are seasonally presented in Tables 5.1; 5.2; 5.3. Average WQI value of Dudhnadi river water, Maximum in summer was (528.60) then Winter (514.19) and minimum value was observed in monsoon (505.33). Water quality index in collected water samples of Dudhnadi river site are very high, so water samples indicating high pollution.

Table 5.1: Calculation of water quality index of sampling area Dudhnadi river for monsoon season.

S. No.	Parameters	Observed Average Values (V_n)	WHO Standards (S_n)	Unit weight (W_n)	Quality rating (Q_n)	$W_n Q_n$	Water Quality Index (WQI) = $\frac{\sum W_n Q_n}{\sum W_n}$ = 505.53
1.	pH	7.55	8.5	0.0003	36.67	0.0123	
2.	EC	157.28	750	3.8039	20.97	7.9769	
3.	TDS	97.07	500	5.7058	19.41	0.0001	
4.	Turbidity	37.70	5	0.0006	754.00	0.4302	
5.	DO	9.93	6	0.0005	54.30	0.0258	
6.	BOD	19.08	2	0.0014	954.17	1.3611	
7.	Cu	0.2629	1.0	0.0029	26.29	0.0750	
8.	Cr	0.7631	0.1	0.0285	763.05	21.769	
9.	Zn	1.2397	5	0.0006	24.79	0.0141	
10.	Pb	0.1761	0.05	0.0571	352.17	20.094	
11.	Mn	0.0722	0.1	0.0285	72.20	2.0598	
12.	As	0.2999	0.05	0.0571	599.77	34.221	
13.	Cd	0.0225	0.005	0.5706	450.83	257.24	
14.	Co	0.1793	0.04	0.0713	448.33	31.976	
15.	Ni	0.1701	0.02	0.1426	850.42	121.31	
16.	Sn	0.4538	0.1	0.0285	453.78	12.946	
17.	Fe	0.6310	0.3	0.0095	210.34	2.0003	
				$\sum W_n = 1$		$\frac{\sum W_n Q_n}{\sum W_n} = 505.53$	

Table 5.2: Calculation of water quality index of sampling area Dudhnadriver for winter season.

S. No.	Parameters	Observed Average Values (Vn)	WHO Standards (Sn)	Unit weight (Wn)	Quality rating (Qn)	WnQn	Water Quality Index (WQI) = $\frac{\sum WnQn}{\sum Wn}$ = 514.19
1.	pH	7.66	8.5	0.0003	44.00	0.0148	
2.	EC	274.45	750	3.8039	36.59	0.0001	
3.	TDS	172.79	500	5.7058	34.56	0.0002	
4.	Turbidity	3.73	5	0.0006	74.67	0.0426	
5.	DO	10.44	6	0.0005	48.37	0.0230	
6.	BOD	16.33	2	0.0014	816.33	1.1645	
7.	Cu	0.1925	1.0	0.0029	19.25	0.0549	
8.	Cr	0.7740	0.1	0.0285	773.95	22.079	
9.	Zn	1.2544	5	0.0006	25.09	0.0143	
10.	Pb	0.1736	0.05	0.0571	347.23	19.812	
11.	Mn	0.0748	0.1	0.0285	74.78	2.1335	
12.	As	0.4156	0.05	0.0571	831.10	47.421	
13.	Cd	0.0225	0.005	0.5706	450.70	257.16	
14.	Co	0.1718	0.04	0.0713	429.42	30.627	
15.	Ni	0.1699	0.02	0.1426	849.42	121.16	
16.	Sn	0.4306	0.1	0.0285	430.55	12.283	
17.	Fe	0.0612	0.3	0.0095	20.40	0.1940	
				$\sum Wn = 1$		$\frac{\sum WnQn}{\sum Wn} = 514.19$	

Table 5.3: Calculation of water quality index of sampling area Dudhnadriver for summer season.

S. No.	Parameters	Observed Average Values (Vn)	WHO Standards (Sn)	Unit weight (Wn)	Quality rating (Qn)	WnQn	Water Quality Index (WQI) = $\frac{\sum WnQn}{\sum Wn}$ = 528.60
1.	pH	7.56	8.5	0.0003	37.33	0.0125	
2.	EC	615.93	750	3.8039	82.12	0.0003	
3.	TDS	330.52	500	5.7058	66.10	0.0004	
4.	Turbidity	7.47	5	0.0006	149.33	0.0852	
5.	DO	9.49	6	0.0005	59.42	0.0283	
6.	BOD	28.33	2	0.0014	1416.67	2.0208	
7.	Cu	0.2933	1.0	0.0029	29.33	0.0837	
8.	Cr	0.7746	0.1	0.0285	774.55	22.097	
9.	Zn	1.2417	5	0.0006	24.83	0.0142	
10.	Pb	0.1770	0.05	0.0571	353.90	20.193	
11.	Mn	0.0784	0.1	0.0285	78.42	2.2371	
12.	As	0.4578	0.05	0.0571	915.57	52.240	
13.	Cd	0.0225	0.005	0.5706	449.50	256.48	
14.	Co	0.1720	0.04	0.0713	429.88	30.660	
15.	Ni	0.1771	0.02	0.1426	885.42	126.30	
16.	Sn	0.4922	0.1	0.0285	492.23	14.043	
17.	Fe	0.6651	0.3	0.0095	221.69	2.1082	
				$\sum Wn = 1$		$\frac{\sum WnQn}{\sum Wn} = 528.60$	

Correlation study of heavy metals in Dudhnadi river water

The correlation coefficients of heavy metals in river water of Dudhnadi River of Kanker areas are listed in Table 6.1. The results indicated at monsoon season that closest relationship or significance correlation (>0.8) was the positive between Mn-Zn, Ni-Mn, correspondingly the remaining elements are less correlative. Table 6.2 indicate are winter season that closest relationship or

significance correlation (>0.8) was the positive between Sn-Cu, Cd-Cr, Fe-Cr, Mn-Zn, Fe-Mn, correspondingly the remaining elements are less correlative. Table 6.3 indicate are summer season that strong positive relationships (>0.5) were observed amongst Fe-Cu, Zn-Cr, Sn-Cr, Ni-Pb, Cd-Mn, correspondingly the remaining elements are less correlative. The soil erosion, urban waste water and agriculture waste water with high concentration of heavy metals increases.

Table 6.1: Correlation between heavy metal pairs in the Dudhnadi river water samples for monsoon season.

	Cu	Cr	Zn	Pb	Mn	As	Cd	Co	Ni	Sn	Fe
Cu	1										
Cr	0.026	1									
Zn	-0.064	0.736	1								
Pb	-0.777	0.231	0.499	1							
Mn	-0.203	0.756	0.822	0.532	1						
As	-0.309	-0.345	-0.350	0.115	0.167	1					
Cd	0.232	-0.357	0.321	0.086	0.043	-0.048	1				
Co	0.637	0.034	-0.143	-0.507	0.191	0.481	0.042	1			
Ni	-0.333	0.716	0.769	0.577	0.987	0.248	-0.018	0.129	1		
Sn	-0.815	0.325	0.493	0.726	0.648	0.317	-0.050	-0.377	0.750	1	
Fe	0.219	-0.944	-0.776	-0.382	-0.720	0.401	0.327	0.260	-0.714	-0.528	1

Table 6.2: Correlation between heavy metal pairs in the Dudhnadi river water samples for winter season.

	Cu	Cr	Zn	Pb	Mn	As	Cd	Co	Ni	Sn	Fe
Cu	1										
Cr	-0.454	1									
Zn	-0.821	0.145	1								
Pb	0.070	-0.568	-0.241	1							
Mn	-0.944	0.568	0.871	-0.285	1						
As	-0.536	-0.333	0.467	0.642	0.366	1					
Cd	-0.209	0.819	0.180	-0.888	0.407	-0.685	1				
Co	0.031	0.073	-0.267	0.622	-0.024	0.302	-0.346	1			
Ni	-0.135	0.329	-0.073	0.105	0.149	-0.314	0.309	0.335	1		
Sn	0.908	-0.229	-0.952	0.067	-0.925	-0.631	-0.079	0.019	0.059	1	
Fe	-0.784	0.851	0.570	-0.404	0.879	-0.005	0.677	0.101	0.454	-0.640	1

Table 7.3: Correlation between heavy metal pairs in the Dudhnadi river water samples for summer season.

	Cu	Cr	Zn	Pb	Mn	As	Cd	Co	Ni	Sn	Fe
Cu	1										
Cr	-0.938	1									
Zn	-0.898	0.719	1								
Pb	-0.455	0.493	0.284	1							
Mn	-0.337	0.417	0.038	0.138	1						
As	-0.252	0.226	0.478	0.090	-0.416	1					
Cd	-0.367	0.373	0.145	-0.269	0.796	-0.557	1				
Co	0.395	-0.537	-0.348	0.207	-0.139	-0.623	-0.148	1			
Ni	0.160	-0.246	0.030	0.507	-0.733	0.331	-0.890	0.445	1		
Sn	-0.679	0.702	0.498	0.143	0.080	-0.186	0.439	-0.209	-0.213	1	
Fe	0.708	-0.707	-0.608	-0.123	0.092	-0.042	-0.279	0.317	0.097	-0.969	1

(B) Seasonal and spatial variations of heavy metal levels in surface sediment samples of river Dudhnadi.

The concentration of heavy metals in surface sediments and its comparison with other rivers of Chhattisgarh, India are given in Table 7.

Table 7: Comparison of average concentration (mg/kg) of heavy metals present in sediment of Dudhnadi River with other World rivers.

Rivers	Cu	Cr	Zn	Pb	Mn	As	Cd	Co	Ni	Sn	Fe	References
Dudhnadi River India	42.20	57.04	104.76	12.59	175.40	10.11	0.26	22.08	61.14	9.37	1753.82	Present study
Chilika Lagoon, India	115	-	104.5	63.7	308.95	-	4.05	38	87.75	-	27801.95	Nazneen et al. (2019)
ChilikaLagon (Short cores), India	24.1	68.3	64.3	22.7	97.4	-	-	23.7	43.0	-	-	Barik et al. (2018)
Ghaghara River	7.25	74.47	15.43	12.49	-	-	0.25	14.90	20.44	-	-	Singh et al. (2017)
Ganga River	29.8	69.9	67.8	26.7	372.0	-	1.7	-	26.7	-	31,988.6	Pandey and Singh (2017)
Ganga, India	56	158	67.8	20	-	-	0.64	20	51	-	-	Singh et al. (2013a)
Cauvery, India	11.2	38.9	93.1	4.3	176.3	-	1.3	-	27.7	-	11144	Raju et al. (2012)
VembanadLake,India	31.5	110.7	208.8	35.5	440.7	-	1.9	19.3	48.2	-	54000	Selvam et al. (2012)
Tapti India	2.3	-	3.65	-	-	-	-	-	-	-	-	Marathe et al. (2011)
Old Brahmaputra River, Bangladesh	6.2	6.6	52.7	7.6	126.2	-	0.48	4.1	12.8	-	-	Bhuyan et al. (2019)
SegaraAnakanLagoon,Indonesia	49	-	123	-	1257	-	-	-	27	-	85659	Syakti et.al. (2015)
Bangshi Bangladesh	-	98.1	117.15	59.99	483.4	-	0.61	-	25.67	-	-	Rahman et al. (2014)
Eupharates, Iraq	18.9	58.4	48	22.6	-	-	1.9	-	67.1	-	-	Salah et al. (2012)
Yangtze, China	60.03	108	230.4	49.2	-	-	1.0	-	41.9	-	-	Wang et al. (2011)
Buriganga, Bangladesh	184.4	101.2	502.3	79.8	-	-	0.8	-	-	-	-	Saha and Hossain (2010)

The average seasonal variation of heavy metal concentration in Cr, Mn, Ni, Sn and Fe are higher the permissible limit in all three seasons but Cd concentration under the permissible limit in all three seasons and seasonal variation of in this metal's concentration Maximum in Summer then Winter and Minimum is Monsoon seasons. Cu concentration higher the permissible limit in all three seasons and Zn concentration higher the permissible limit

in summer season but Pb concentration under the permissible limit in all three seasons and seasonal variation of in this metal's concentration Maximum in Summer then Monsoon and Minimum Winter seasons. Concentration of As and Co under the permissible limit in all three seasons and seasonal variation of in this metal's concentration Maximum Monsoon then Summer and Minimum is Winter season in Dudhnadi river Fig. 5.

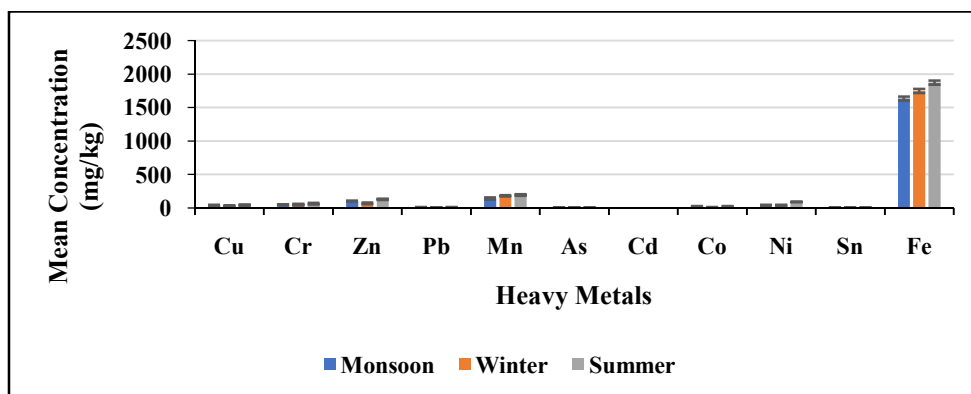


Fig. 5: Graph showing mean concentrations (mg/kg) of heavy metals in sediment of the river Dudhnadi during three seasons.

Correlation study of heavy metals in Dudhnadi river sediment.

The correlation coefficient between heavy metals in Dudhnadi river sediment is very significant in this study. The closest relationship was (>0.8) the positive amongst Pb-Zn, during monsoon season Table 8.1. The Table 8.2 indicate are winter season that very close correlation coefficient (>0.8) was the positive amongst Pb-Zn. The closest or significance correlation coefficient was (>0.8)

the positive amongst Mn-Cu during summer season Table 8.3. Respectively the remaining elements in all three seasons are less correlative. The positive Pearson's correlation coefficient for the heavy metals of the Dudhnadi river sediment could indicate the same or similar anthropogenic and natural source input.

Table 8.1: Correlation between heavy metals analyzed in sediment of the Dudhnadi river for monsoon season.

	Cu	Cr	Zn	Pb	Mn	As	Cd	Co	Ni	Sn	Fe
Cu	1										
Cr	-0.992	1									
Zn	0.089	-0.115	1								
Pb	0.312	-0.303	0.924	1							
Mn	0.081	-0.016	0.549	0.751	1						
As	0.184	-0.092	0.203	0.506	0.736	1					
Cd	-0.230	0.196	-0.628	-0.643	-0.569	-0.126	1				
Co	0.502	-0.472	-0.246	-0.012	0.348	0.093	-0.219	1			
Ni	-0.128	0.128	-0.273	-0.323	0.023	-0.480	-0.320	0.633	1		
Sn	0.368	-0.410	0.345	0.176	-0.316	-0.528	-0.556	-0.133	0.137	1	
Fe	0.594	-0.669	-0.276	-0.300	-0.589	-0.568	0.300	0.330	0.133	0.373	1

Table 8.2:Correlation between heavy metals analyzed in sediment of the Dudhnadi river for winter season.

	Cu	Cr	Zn	Pb	Mn	As	Cd	Co	Ni	Sn	Fe
Cu	1										
Cr	0.445	1									
Zn	-0.222	0.243	1								
Pb	-0.378	0.017	0.938	1							
Mn	0.140	0.397	0.765	0.711	1						
As	0.000	0.012	-0.390	-0.322	0.178	1					
Cd	0.120	0.597	-0.497	-0.601	-0.300	0.401	1				
Co	-0.601	-0.710	-0.227	-0.083	-0.148	0.547	-0.184	1			
Ni	0.185	-0.060	-0.837	-0.859	-0.919	-0.104	0.542	-0.126	1		
Sn	-0.467	0.372	0.624	0.709	0.527	0.010	0.091	-0.164	-0.549	1	
Fe	-0.617	-0.901	-0.378	-0.118	-0.622	-0.031	-0.295	0.636	0.295	-0.189	1

Table 8.3:Correlation between heavy metals analyzed in sediment of the Dudhnadi river for summer season.

	Cu	Cr	Zn	Pb	Mn	As	Cd	Co	Ni	Sn	Fe
Cu	1										
Cr	0.545	1									
Zn	-0.103	-0.136	1								
Pb	-0.157	-0.209	-0.675	1							
Mn	0.819	0.671	-0.075	-0.361	1						
As	-0.212	-0.003	0.671	-0.775	-0.226	1					
Cd	0.084	-0.327	-0.238	-0.293	0.032	0.250	1				
Co	-0.393	-0.732	0.644	-0.505	-0.393	0.583	0.428	1			
Ni	0.123	-0.433	0.070	0.475	-0.011	-0.632	-0.367	0.055	1		
Sn	0.354	-0.291	0.285	0.040	-0.202	0.207	0.124	0.280	0.298	1	
Fe	0.441	0.529	0.282	-0.805	0.456	0.695	0.398	0.089	-0.729	0.100	1

Indices

Several indices were used to assess the metal contamination levels in the sediment samples, namely Contamination Factor (CF), Contamination Degree (CD), Pollution Load Index (PLI), Enrichment Factors (EF), and Geo-accumulation index (I-geo). World surface rock average data of heavy metals which was used as background values were taken from (Martin and Meybeck1979).

The heavy metals Contamination factors of Dudhnadi river sediment Zn,Co, Sn are demonstrating a moderate level CF value ($1 \leq CF < 3$) but Cu, Cr, Pb,Ni, Mn, As, Cd and Fe are shows Low CF value ($CF <$

1)shown in Table No. 9.1. On the basis of mean value contamination factor for heavy metals of Dudhnadi river sediment was in order

$Sn > Co > Zn > Cu > Ni > Cd > As > Pb = Cr > Mn > Fe$.

The Contamination degree of heavy metals in Dudhnadi river sediment was observed 8.84 demonstrates a moderate level CD value ($6 \leq CD < 12$)shown in Table No. 9.1.The Pollution Load Index (PLI) of heavy metals in Dudhnadi river sediment was observed 0.60 demonstrates.The result indicate are Pollution Load Index (PLI) that the presence of pollutants in these rivers is around the baseline level ($PLI=1$)shown in Table No. 9.1.enrichment factor of heavy metals in

Dudhnadi river sediments Mn, Cr, Pb, determines a moderate level enrichment value ($5 \leq EF < 20$), Cu, Zn, As, Cd, Co, Ni was observed very significant enrichment value ($20 \leq EF < 40$) and Sn show extremely high enrichment ($EF > 40$), enrichment value was in order of Dudhnadi river sediment $Sn > Co > Zn > Cu > Ni > Cd > As > Cr > Pb > Mn$. The

geo-accumulation index of heavy metals in Dudhnadi river sediment. The calculated results of I-geo indicate that only Sn could be considered unpolluted to moderately pollute but all other metals showed an unpolluted. The I-geo value was in order of Dudhnadi river sediment $Sn > Co > Zn > Cu > Ni > Cd > As > Cr > Pb > Mn > Fe$.

Table 9.1: Contamination Factor, Contamination Degree and Pollution Load Index and Enrichment Factor Values.

S. No.	Heavy Metals	Dudhnadi River sediment	
		Contamination Factor	Enrichment Factor
1.	Cu	0.94	24.60
2.	Cr	0.63	16.62
3.	Zn	1.10	28.92
4.	Pb	0.63	16.51
5.	Mn	0.21	5.41
6.	As	0.78	20.40
7.	Cd	0.01	22.34
8.	Co	1.20	31.39
9.	Ni	0.90	23.58
10.	Sn	1.56	40.97
11.	Fe	0.04	1.00
CD		7.99	
PLI		0.40	

Table 9.2: geo-accumulation index (I-geo) Values.

I-geo of Dudhnadi river sediment				
S.No.	Heavy metals	Monsoon	Winter	Summer
1.	Cu	-0.61	-0.89	-0.55
2.	Cr	-1.42	-1.32	-1.02
3.	Zn	-0.40	-0.96	-0.10
4.	Pb	-1.44	-1.48	-0.91
5.	Mn	-3.14	-2.78	-2.69
6.	As	-0.91	-0.98	-0.96
7.	Cd	-1.17	-1.03	-0.32
8.	Co	-0.04	-0.99	-0.12
9.	Ni	-1.20	-1.18	-0.12
10.	Sn	-0.04	-0.04	0.24
11.	Fe	-5.40	-5.30	-5.20

CONCLUSION

Above the study and from this observation of Physico-chemical parameters in river water and Heavy metals concentration in river water and sediment, it can be concluded that Dudhnadi River water is getting polluted. Most of the parameters in

water were found high in concentration compared to the standards prescribed by WHO and WQI indicates of the Dudhnadi river water shows very high which is indicates unsuitable for drinking purpose. The high value of WQI of this river is mainly due to the high value of metal concentration. The

result of WQI showed that the water is not suitable for drinking and also more contaminated of the Dudhnadi river sediments. The high-level pollution from the municipal, agriculture water waste and soil erosion which cause environmental problems, will affect plant, animal and human life directly and indirectly. Finally, People should be educated about their activities which affect

the natural ecosystem with a different approach. Problems related to the environment and its ecosystem requirement to be discussed seriously. Proper policies and programs towards solving problems should be employed. The present data on the Dudhnadi river status also indicates the need for regular monitoring of water resources.

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CONCEPT, EFFECT AND MISUSE OF PAROLE: A CRITIQUE**Anita Sable¹**

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ABSTRACT

Every human life is a precious. Freedom is one of the most important facets of human life. Article 21 of the constitution of India ensures that “no person shall be deprived of his life or personal liberty except according to a procedure established by law”. As ,the penal laws been imposed over the accused keeping the reformatory theory and the application of the same, the researcher in this article has dealt with the rights of liberty which the accused can exercised following the due procedure of law. In this paper the researcher has dealt in detail the concept of parole and the law relating to parole in India. As the reformatory theory is more about bringing the accused to his social life has proven to be a useful tool, but at the same time in a situation like Covid-19 was misused by the parole prisoners. The researcher in this article also dealt with the judicial activism by way of entertaining the Suo –motu writ petition by apex court wherein the Supreme Court issued directions for re cognition of the prison making use of parole for the eligible prisoners for the protection of the inmates prisoners from the deadly virus. At the last the researcher has come up with the recommendations and suggestions if included and implemented is like to be prove protecting the right to life of the prisoners under parole and in prison in the better way.

Keywords: Parole, Accused, Article 21, Constitution, Reformatory theory, inmates, prisoners.

Introduction

Freedom is not only an important facet of a human life but also an equally important legal right. It is a well settled proposition of law that a man can only be deprived of his freedom by following due process of law. Article 21 of the Constitution is an important fundamental right and connotes as the heart of the constitution. Article 21 states that, “No person shall be deprived of his life or personal liberty except according to a procedure established by law”. Interestingly, Article 21 is a classic example of a legal paradox wherein in the first part it categorically provides to deprive a man of his freedom according to a procedure established by law and in the second part it craves out an exception in the form of right to life, which undoubtedly includes right of freedom. Generally, a person who has been convicted of an offence is deprived of his freedom but under certain exceptions that person can avail temporary freedom under right to life in the form of bail, furlough and parole. The present article is aimed at highlighting the concept, effect and misuse of parole in India.

MEANING AND CONCEPT OF PAROLE

Parole is the release of a prisoner, either temporarily for a special purpose or completely before the expiry of a sentence, on the promise of good behavior; such a promise is known as a word of honour provided in the parole order. The word parole is derived from the French 'je donne ma parole 'I give my word.' i.e. the word of honour. This word was used by the prisoners of war for their release by giving promise to the captor. According to Black's Law Dictionary parole has been defined as “release from jail, prison or other confinement after actually serving part of the sentence”.

The Hon'ble Supreme Court describes 'parole' is a form of "temporary release" from custody, which does not suspend the sentence or the period of detention, but provides conditional release from custody and changes the mode of undergoing the sentence . In *Jenkins v. Madigan* , US Court of Appeals for the Seventh Circuit had held that "A 'parole' is not a 'suspension of sentence', but is a substitution, during continuance of parole, of lower grade of punishment by confinement in

legal custody and under control of warden within specified prison bounds outside the prison, for confinement within the prison adjudged by the court.

In *Wooden v. Goheen* Court of Appeals of Kentucky, had held that 'Parole' does not vacate sentence imposed, but is merely a conditional suspension of sentence. According to The Law Lexicon "A parole is a form of conditional pardon, by which the convict is released before the expiration of his term, to remain subject, during the remainder thereof, to supervision by the public authority and to return to imprisonment on violation of the condition of the parole." Thus, it can be noted from above referred authorities that parole is a form of temporary release from custody and not the suspension of sentence.

LAW RELATING TO PAROLE IN INDIA

Parole was introduced as a way to encourage responsible behavior in rehabilitating the prisoners and at the same time to provide them an opportunity to reform themselves into a better human being and also to provide them with an opportunity to maintain their social ties. Some of the major concepts that underlie the parole system include the reduction of jail term after good and responsible behavior in prison and to allow the prisoners to develop a positive attitude, self-confidence and interest in life.

Further, In *Hiralal Mallick v. State*, the hon'ble Apex Court while emphasising the need for grant of parole categorically stated that "A prisoner insulated from the world becomes bestial and, if his family ties are snapped for long, becomes dehumanised. Therefore we regard it as correctionally desirable that this appellant be granted parole and expect the authorities to give consideration to paroling out periodically prisoner, particularly of, the present type for reasonable spells, subject to sufficient safeguards ensuring their prober behavior outside and prompt return inside".

In India, there are no specific statutory provisions dealing with the law on grant of parole. The Code of Criminal Procedure does not contain any provision for grant of parole, however, it categorically provides for bail. The grant of parole in India is governed by

rules made under the Prisons Act, 1894 and the Prisoners Act, 1900. These central Acts have delegated the rule making power to the states for framing appropriate rules regarding the grant of parole. It is pertinent to note that, different states have different rules regarding grant of parole. For instance, in Maharashtra the rules regarding grant of parole are covered under Maharashtra Prisons (Bombay Furlough and Parole) Rules, 1959. The Prisons (Bombay Furlough and Parole) Rules, 1959, have been enacted by exercising rule making power under section 59(5) of the Prisons Act, 1984. The main objectives to release the prisoners on leave as per rule 1(A) and 19 of The Prisons (Bombay Furlough and Parole) Rules, 1959, are as follows:

1. To enable the prisoner to maintain continuity with his family life and deal with family matters.
2. To save the prisoner from evil effects of continuous prison life.
3. To enable the prisoner to maintain and develop his self-confidence.
4. To enable the prisoner to develop constructive hope and active interest in life.

Rule 18 of said rules provides for the Authorities competent to sanction parole. Subject to exceptions provided under the said rule, the Divisional Commissioner or the Additional Divisional Commissioner is empowered to release a prisoner on parole. In case of refusal of parole by such authorities, an appeal shall lie to the State Government, whose decision thereon shall be final it is given to the decision or the State Government. It is further provided in the said rule that it would be exclusive discretion on the part of the authority whether to grant the parole to the prisoner or not and therefore such discretion must be exercised judiciously and not arbitrarily. Thus, it can be said that the action for grant of parole is generally speaking an administrative action. Rule 19 of the said rules provides for the grounds on which application which has been made under Rule 21 for grant of parole can be entertained and allowed. Subject to various enquiries and conditions as provided under Rule 23 & 24, parole can be granted to the prisoner.

The Maharashtra Prisons (Bombay Furlough and Parole) Rules, 1959 was recently amended by the Maharashtra Prisons (Mumbai Furlough and Parole) Rules, 2016, this new amendment brought in various new provisions in the existing rules. One of the important amendments was that it made a distinction between parole. Now Rule 19 of the original would provide for two types of parole namely i. Emergency parole and ii. Regular parole. The said rule was further amended to increase the duration for which a prisoner can remain out on parole.

After the outbreak of Covid-19 Pandemic, slew of directions were issued by the hon'ble Supreme Court to facilitate the de-congestion of the prisons all over India. The Government of Maharashtra exercising its rule making powers amended the Maharashtra Prisons (Bombay Furlough and Parole) (Amendment) Rules, 1959 by Maharashtra Prisons (Bombay Furlough and Parole) (Amendment) Rules, 2020. The present amendment was aimed to amend Rule 19 by insertion of clause (C) in sub-rule (1) in order to include grant of Emergency Parole on declaration of epidemic under the Epidemic Diseases Act, 1897, by State Government. The above amendment was challenged before the hon'ble Bombay High Court being violative of Article 14 & 21 of the Constitution. The court in para 35 of its judgment categorically held that "For the reasons stated above, the challenge raised to the constitutional validity of the portion of the proviso to Clause (C) of Sub Rule 1 of Rule 19 of the Mah. Prison Rules, 1959, making the provisions of Clause (C) of Sub Rule 1 of Rule 19 of the Mah. Prison Rules, 1959 inapplicable to the prisoners having permanent residence outside the State of Maharashtra, on the touchstone of Articles 14 and 21 of the Constitution of India is rejected and it is held that the proviso to Clause (C) of Sub Rule 1 of Rule 19 of the Mah. Prison Rules, 1959 is constitutionally valid."

ROLE OF JUDICIARY FOR GRANT OF PAROLE

Admittedly the grant of parole is essentially an executive function, however, if the Court finds that any executive action in rejecting the grant of parole to a prisoner is

resulted from an arbitrary executive action and it has the effect of suffocating the Article 14 or 21 of the Constitution, then the Constitutional Courts has all the powers to restore the rule of law and restore the residuary fundamental rights of an aggrieved prisoner.

It is pertinent to note here that there are catena of instances wherein, the constitutional courts have rightly upheld the rights of prisoners and categorically quashed the arbitrary executive actions. The hon'ble Delhi High Court in Smt. Sharda Jain vs State, have categorically held in para 3 of the judgment that "the grant of Parole being essentially an executive function, it is for the Government to consider the request made by the convict for the purpose and to pass an appropriate order on it. If however, the order passed by the Government, declining parole is based upon irrelevant ground or extraneous considerations or is otherwise wholly unsustainable being an order which no reasonable person could, in the facts and circumstances of the case have passed or is totally perverse or arbitrary, it is open to the Court, in exercise of its powers under Article 226 of the Constitution to set aside such an order and direct release of convict on parole".

In Sunil Fulchand Shah v Union of India, the Constitutional bench of the Apex Court has held that, "the bar of judicial intervention to direct temporary release of a detenu would not, however, affect the jurisdiction of the High Court's under Article 226 of the Constitution or of this Court under Article 32, 136 or 142 of the Constitution to direct the temporary release of the detenu, where request of the detenu to be released on parole for a specified reason and/or for a specified period, has been, in the opinion of the Court, unjustifiably refused or where in the interest of justice such an order of temporary release is required to be made. That jurisdiction, however, has to be sparingly exercised by the Court and even when it is exercised, it is appropriate that the Court leave it to the administrative or jail authorities to prescribe the conditions and terms on which parole is to be availed of by the detenu".

In *Suraj v. State of Rajasthan*, the Rajasthan High Court categorically held that Primary objective of parole is to facilitate family ties being maintained and cannot be rejected on flimsy grounds. In *Sarita Rajwade v. State of Chhattisgarh*, hon'ble Chhattisgarh High Court while setting aside the order of District Magistrate wherein petitioner's application for grant of leave on parole under Rules 4 and 6 of the Chhattisgarh Prisoners Leave Rules, 1989 was rejected, categorically held that "the offence committed by the petitioner though is a serious offence yet as per the law, if her release is not detrimental to the public interest and it fulfils the requirement for the grant of parole, she is entitled to be released on parole as she is in jail for more than three years and ten months and her conduct is shown to be good. In light of the aforesaid observations, parole was granted".

In March, 2020 Covid-19 pandemic broke out in India. This deadly virus is highly contagious and life threatening. The only remedy to avoid getting infected through this virus was keeping a 2 meters physical distance and washing hands regularly with sanitizer. However, in place like jails where it would be very difficult to keep such measures in check and therefore extraordinary measures were required to be made so that jails could be saved from the wrath of Covid-19 pandemic. The hon'ble Supreme Court taking serious note of this issue, in *RE : CONTAGION OF COVID 19 VIRUS IN PRISONS*, passed slew of directions and in para 8 of the said judgment categorically addressed that, "We may notice that India has more than four lakh prison inmates. It is observed that some of the prisons in India are overburdened and are housing inmates beyond optimal capacity. In this regard, we may notice that the requirement of de-congestion is a matter concerning health and right to life of both the prison inmates and the police personnel working. Reduction of impact of Covid-19 requires this Court to effectively calibrate concerns of criminal justice system, health hazards and rights of the accused. From limiting arrests to taking care of Covid-19 Patients, there is

a requirement for effective management of pandemic from within the prison walls so as to defeat this deadly virus".

MISUSE OF PAROLE

In *Veramchaneni Raghvendra Rao v Government of Andhra Pradesh*, the Government released persons sentenced to life imprisonment on parole on flimsy grounds such as financial problems, illness of relatives etc. The allegation in the writ petition was that these convicted persons belonged to some political parties and it was as a result of political pressure that these persons were released on parole when their appeal was pending before the appellate court. In *Kesar Singh v. State*, of Himachal Pradesh High Court laid down that the exercise of power of releasing a prisoner on parole or furlough must not be looked upon as an

act of charity, compassion or clemency but as an act in the discharge of a legal duty required to be performed upon the fulfillment of the prescribed conditions to effectuate a salutary purpose.

In *Bhuri Singh v. State*, the hon'ble Rajasthan High Court while deciding a criminal writ petition, a Single Judge Bench held that "Consideration for grant of parole is whether prisoner is likely to relapse into crime if released".

Recently, Dr Jalees Ansari who is also called as Dr. Bomb as he has been convicted in the Ajmeer blasts, Jaipur serial blast and Malegaon blast case and accused of plotting and executing over 50 bombs blasts across the country since early 90s and was presently serving life sentence was released on parole by Supreme Court order on 28.12.2019. He was found missing on 16.01.2020 when he was supposed to report next day. Delhi High Court had granted 18 days parole to Manu Sharma, who is undergoing life term for killing model Jessica Lal in 1999, to pursue his LLB course and get his marriage registered.

In a surprising lapse, some of the prisoners released on parole from the high-security Tihar jail have gone "missing". Jail authorities have reached out to Delhi Police to trace them. Till mid-March 2021, 112 out of 1,184 convicts were reported untraced. Tihar

jail houses some 20,000 convicts and under trials. Those suffering from illnesses such as HIV, cancer, kidney dysfunction, Hepatitis B or C, asthma and TB were initially released for eight weeks, but later the period to report back was extended from time to time.

Above authorities clearly shows that how right of freedom can be misused in the guise of right of life. Considerable rampant misuse of temporary release in the form of bail, furlough and parole was seen particularly after the slew of directions issued by the hon'ble Apex Court to de-congest the prisons in order to uphold the right to life of inmates. The Government of India through Ministry of Home Affairs had to intervene to put a curb in such lenient practice of grant of furlough and parole which resulted in rampant misuse of temporary freedom rather than use of it. The Ministry of Home Affairs, while showing its displeasure over misuse of temporary release of jail inmates stated in its letter "Prison, as a deterrent and an institution of correctional administration, is a key constituent of criminal justice system. Imprisonment besides being a mode of punishment also aims at protecting the society from criminal activities. A balance is, therefore, considered essential between ensuring the rights of inmates and protecting

the society from further harm". The said direction went on to further recommend the use of Model Prison Manual, 2016 for better implementation of rules for grant of jail inmates on grounds of furlough and parole. Lastly, emphasis was made on to consider the Model Prison Manual in the existing rules providing for grant of parole and highlighted that it is necessary to ensure careful and comprehensive examination of each such case. Further, in order to ensure that inmates released on parole, furlough and premature release etc. do not violate law, systems must be put in place for monitoring and follow up of each case.

CONCLUSION

"Prison administration is an important element of the criminal justice system in India. Even though prison reforms is a State subject as per the Constitution of India, considering its importance, the Government of India has over the years been providing the State Governments all requisite support and assistance to modernise prisons across the country and facilitate the task of rehabilitation and reformation of prisoners. The Model Prison Manual is a step in this direction and strives to serve as a benchmark that all States should emulate and seek guidance from."

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“ASSESSMENTS OF FACTORS AFFECTING CUSTOMER’S SATISFACTION TOWARDS EVENT MANAGEMENT PRACTICES”

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ABSTRACT:

In last one or two decades a big scale has evolved in the Event management which includes MICE. For successful events a continuous up gradation and uniqueness in diligent manner is required. A proper planning and a process with excellent implementation are essential to achieve your individual or your organization goals for any form of events. Organizing an event is a laborious job and achieving your aim with that event is even tougher. As per a survey, 81% of pleased customers are more likely to do business with you again if they have a favorable experience. Satisfaction leads to loyalty. Once in an event company when customers have placed faith the company and company also have assured continuing in delivering their services as per their expectations, they will constantly to do business with them in terms of attending events, participating or associating with that company. As Event Management plays a vital role in strengthening of any country and customer satisfaction in present situation. This paper is an attempt to evaluate how the factors affecting customer satisfaction in Event Management area.

Key Words: Event Management, Event Management Industry, Perception, preferences, Customer attitudes, Impact Factors.

1. INTRODUCTION

Event management activities overpass the gap between organizations and customers. Executing the occasion as well as other functions of the occasion is minutely related to the event management of an event. An event means a program that requires systematic planning and implementation through the establishment of committee members that will be beneficial to the customers. In line with the increasing number of competition between private companies and the government, maintaining customer satisfaction is one of the top priorities to sustain goodwill with existing customers and attracting new ones. Environment and communication are some additional areas which are needed to be look after as well as client satisfaction by the event management organizations. Performance of a company is measured through the highest favorable percentage of customer satisfaction. It is main parameter which determines the quality of services provided to the customers. It is also essential to safeguard the continuity of a company and to acquire the confidence of all parties. Client satisfaction is main objective of any activity organized by any event company or its department said by Ducker (1973) in Ksenia Novikova. Reaching to

expectations of the customers and providing the suitable environment for such event are a few tools that can be an aid to create an everlasting experience which leads to customer satisfaction... The complication usually occurs when blue collar laborers were unable to apply all those knowledge, especially while interacting with their customers. This study would be valuable to the people who worked with District Religious Office in uplifting their customers' assistance skills while organizing events. Moreover, the outcome also would be advantageous to the senior authorities, especially an organization whose prime focuses on customer services to determine the appropriate training for their workers.

2. LITERATURE REVIEW

Competitive advantage is regarded as a key source of service quality as it acts as a key to hold on and attract customers. According to Shin and Kim (2008), Tsoukatos and Rand (2006), Cronin and Taylor (1992) and Kim et al. (2015a) service quality is associated with honesty and customer satisfaction. This alliance has been confirmed, and research has proven the favorable impact on service quality for the customer satisfaction grid, which eventually guide to the loyal customer (Santouridis & Trivellas, 2010; Deng et al.,

2009; Turel&Serenko, 2006; Kim et al., 2004; Rashed&Abadi, 2014). As such, service quality is included as an independent varying to customer loyalty.

Factors affecting customer satisfaction according to Lupioyadi, (2001) Include:

1. Product quality, i.e. Quality used products shows favorable results and customers will feel satisfied.
2. Quality of service or service, as expected service or when receives good service then the customer will feel satisfied
3. Emotions, the customer will feel proud and gain confidence that others will be amazed by him when using products with a particular brand that tends to have a high grade of satisfaction. Satisfaction obtained not because of the quality of the product but social or vanity that makes customers feel satisfied with a particular brand.
4. Price, i.e. Economical price value products that have the same quality will add a higher value to customers.

According Irawan (2004: 37), the factors that drive customer satisfaction are as follows:

1. Product quality, customer satisfied if after buying and using the product turns out the product quality is good.
2. Price, Usually a less expensive price is an important source of satisfaction because customers will get high value for money in the case of sensitive customers
3. Service Quality, satisfaction with service quality is effortful to replicate in the situation of Service quality is a driver that has many dimensions, one of which is popular is SERVQUAL.
4. Emotional Factor, Emotional giver value product make its customer feel content (proud).

Factors influencing customer perception and expectation according to Gaspersz (Nasution, 2005: 50) are as follows:

1. Needs and desires associated with things that customer's impression when they are

trying to make transactions with producers or suppliers of products (companies). If at that time the needs and desires are huge, expectations or assumption of customers will be high, and vice versa.

2. Word of mouth by friends, where they will share the quality of the product to be purchased by the customer. This clearly impact customers' perceptions majorly on products that are perceived to be at high speculation.

Oliver (2010)

States: Post-purchase evaluation is the result of customer satisfaction where the perception of product performance exceeds customer expectations.

3. RESEARCH METHODOLOGY

The purpose of this study is to assess the factors influencing customers' satisfaction towards event management practices. Also, determining economic impact of customers' satisfaction on event management companies is among the objectives of this study.

Population of the study consists of 92 Event Management Companies who are into event management industry in the Gujarat State. The primary data needed for the study were collected with questionnaires. The questionnaires were administered to the respondents in a face-to-face and online manner. When preparing the questionnaire form, literature was reviewed and pilot study taken. Total 90 + questions were included in the questionnaire to learn and study different factors. people were chosen with convenience sampling. The respondents were requested to reply these items according to five-level Likert type scale.

(1=Strongly disagree, 2=Disagree, 3=Neither disagree nor agree, 4=Agree and 5=Strongly agree).

Data were analysed using SPSS 17 (Statistical Package for Social Sciences) for Windows 8.

4. FACTOR ANALYSIS

Table: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.740
Approx. Chi-Square		2848.532
Bartlett's Test of Sphericity	df	1035
	Sig.	.000

Kaiser-Meyer-Olkin – Measure of Sampling Adequacy index is used to examine the appropriateness of factor analysis. It also compares the magnitudes of the observed co – relation coefficient to the magnitude of the partial correlation coefficients. High values of KMO (usually between 0.5 and 1.0) indicate that data adequacy is appropriate and adequate for factor analysis.

From the above table, it is seen that Kaiser-Meyer-Olkin – Measure of Sampling Adequacy (KMO) statistic is 0.740. The value suggests that there is no error in 74% of the sample and data is appropriate and adequate for factor analysis. The remaining 26% suggests that there may be some sort of error.

Bartlett’s Test of Sphericity shows the strength of relationship among variables is strong or not. It presents good idea to proceed to factor analysis for the data. It is a test often used to examine the hypothesis that the variables are uncorrelated in the population i.e. population correlation matrix is an identity matrix. This test finds the overall significance of correlation matrix and provides the statistical probability that the

correlation matrix has significant correlations among at least some of the variables.

In present study, Bartlett’s Test’s Chi Square value is 2848.532, DF = 1035, significance at 0.000. This significant value indicates that correlation coefficient matrix is not an identity matrix. Bartlett’s test of Sphericity resulted in a large value (2848.532) which indicates that the variables do not correlate with each other.

Communalities explain the proportion of each variable’s variance which is explained by the factors. Full description of business plan is available to clients has the variance of 0.840. The other variance for each variable is shown in above table. The variables which have lower variance than 0.400 will be excluded from final factor analysis. Variables with high values are well represented in the common factor space, while variables with low values are not well represented. (In this example, we don’t have any particularly low values.) They are the reproduced variances from the factors that you have extracted. One can find these values on the diagonal of the reproduced correlation matrix.

Rotated Component Matrix^a

	Component							
	1	2	3	4	5	6	7	8
Full description of business plan is available to clients	.874							
Managing Different events will create an opportunity for me to create relationship with others.	.769							
Proper Work allocation amongst all workers are essential;	.745							
At the level of Event Planning preparation of checklist is must.	.708							
Arrangement of Client Servicing & Planner	.750							
Understanding the requirement of client				.643				
Suitable timing (Week, Month, Day, Year, Holiday etc.)				.729				

Identification of infrastructure requirement				.691				
Preparation of pre event charts (finance; marketing; entertainment; catering and human resource management)				.552				
Preparation of charts during event (full staff complement and emergency reporting relationships)				.609				
Cost associated with venue					.740			
Transport and parking					.583			
Toilets and changing room					.810			
Catering facility					.800			
Learning and updating from past experience			.672					
Identification of areas which require more cash			.847					
Networking of activities			.687					
Backup plan (for Climate and other conditions)			.547					
The industry of the firm affects access to finance		.795						
The firm size affects access to finance		.575						
The firm's business information affects access to finance		.752						
The legal status of the firm affects access to finance		.594						
The firm's collaterals affects access to finance		.557						
There is proper event crew availability							.529	
There is quick response from the registration people							.551	
The execution of event planning is perfect							.537	
Event management companies must follow the established standards							.716	
There are proper management for the quality control							.597	
Employees are well dressed and their appearance is pleasant							.670	
Registration staff is very helpfully and responsible							.691	
Behaviour of event crew is very polite							.506	
Quality of food and beverages						.591		
Taste and preferences of customers regarding food and beverages						.830		
Client testing and approval						.599		
Create innovation in serving food and beverages						.644		
Variety of cuisine						.860		
Live streaming of event								.719
Establishment of 3D displays and								.814

projection mapping								
Multi use event apps								.756
Establishment of way finding with GPS enabled Google maps								.786
RFID tracking or use of Latest Technological equipment								.534

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 15 iterations.

With the help of Exploratory factor analysis, rotated component matrix identified following eight factors of event management practices:

- Strategic planning
- Credit facility
- Past experience
- Pre event planning
- Operational management
- Foods & Beverages
- Employee characteristics & Service climate
- Technology

Factor 1 -Strategic Planning comprises of five items: Full description of business plan is available to clients having factor loading 0.874, Managing Different events will create an opportunity for me to create relationship with others having factor loading 0.769, Proper Work allocation amongst all workers are essential having factor loading 0.745. At the level of Event Planning preparation of checklist is must having factor loading 0.708 and Arrangement of Client Servicing & Planner having factor loading 0.750.

Factor 2 - Credit Facility comprises of five items: The industry of the firm affects access to finance having factor loading 0.795, The firm size affects access to finance having factor loading 0.575, The firm's business information affects access to finance having factor loading 0.752, The legal status of the firm affects access to finance having factor loading 0.594, and The firm's collaterals affects access to finance having factor loading 0.557.

Factor 3 -Past Experience comprises of four items: Learning and updating from past experience having factor loading 0.672, Identification of areas which require more cash having factor loading 0.847, Networking

of activities having factor loading 0.687, and Backup plan (for Climate and other conditions) having factor loading 0.547.

Factor 4 - Pre event planning comprises of five factors: Understanding the requirement of client 0.643, Suitable timing (Week, Month, Day, Year, Holiday etc.) having factor loading 0.729, Identification of infrastructure requirement having factor loading 0.691, Preparation of pre event charts (finance; marketing; entertainment; catering and human resource management) having factor loading 0.552, and Preparation of charts during event (full staff complement and emergency reporting relationships) having factor loading 0.609.

Factor 5 identifies as Operational management comprises of four factors: Cost associated with venue having factor loading 0.740, Transport and parking 0.583, Toilets and changing room having factor loading 0.810, and Catering facility having factor loading 0.800.

Factor 6 - Food & Beverages comprises of five items: Quality of food and beverages having factor loading 0.591, Taste and preferences of customers regarding food and beverages having factor loading 0.830, Client testing and approval having factor loading 0.599, Create innovation in serving food and beverages having factor loading 0.644, and Variety of cuisine having factor loading 0.860.

Factor 7 - Employee Characteristics & service climate comprises of eight items: There is proper event crew availability having factor loading 0.529, There is quick response from the registration people having factor loading 0.551, The execution of event planning is perfect having factor loading 0.537, Event management companies must follow the established standards having factor loading 0.716, There are proper management

for the quality control having factor loading 0.597, Employees are well dressed and their appearance is pleasant having factor loading 0.670, Registration staff is very helpfully and responsible having factor loading 0.691, and Behaviour of event crew is very polite having factor loading 0.506.

Factor 8 - Technology comprises of four items: Live streaming of event having factor loading 0.719, Establishment of 3D displays and projection mapping having factor loading 0.814, Multi use event apps having factor loading 0.756, Establishment of way finding with GPS enabled Google maps having factor loading 0.786, RFID tracking or use of Latest Technological equipment and having factor loading 0.534.

4. CONCLUSION

Honoring the space in this research paper; does not allow me to cover nearly all the current research being carried on worldwide, nor does it allow for a detailed discussion of future event management research areas but I hope I have provided a

look at what should be coming down the road. Overall, the field of event management has not only grown in size but I feel grown in quality of research being conducted and disseminated in the professional journals. It is but obvious that all the factors will have not the same impact on different types of event; which is vary event to event and customer to customer and region to region. Alternative conclusion maybe that involvement of audience or guests, which events have directly impacts and need to focus on most common in Food, Quality, service, hygiene, cleanliness, service staff. Event Management staff's appearance, Communication and Managerial skill also affects the Customer satisfaction. Other factors such as Technology, Décor, Firm Size will have a less impact on customer satisfaction as compared to the above mentioned factors. Researchers have scope to carryout the research on specific category of event with a limited region.

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DEVELOPMENT OF SOCCER SKILL TESTS FOR 12-16 YEARS OF AGE**Waribam James Singh¹, Dr. Laishram Santosh Singh², Dr. Ch. Pradeep Singh³**

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Department of Physical Education & Sports Science, Manipur University, Canchipur – 795003, Manipur, India, Email: waribamjames@manipuruniv.ac.in Contact no.: 8256942809**ABSTRACT**

Purpose: The purpose of the study was to develop a soccer skill tests. A total of 50 male soccer players were selected from the soccer academy of the Tiddim Road Athletic Union (TRAU), Imphal West, Manipur who regularly practice soccer. The age of subjects was range between 12-16 years.

Method: The data was collected by administering selected soccer skill tests. To investigate the reliability and construct validity of soccer skills testson the basic of soccer skills were selected i.e. Ground Pass on a Stationary Ball for Accuracy, Kicking on a Stationary Ball for Distance, 30-Meters Dribbling and Tackling 1 Vs 1 in Limited Area. Statistical analysis were consisted of descriptive statistics, Pearson correlation and factor analysis technique were used for developing of soccer skill tests on the basis of performance and coefficient.

Results: Findings of the study reveals the descriptive statistics and relationship among soccer skills i.e., Ground pass on a stationary ball for accuracy mean and standard deviation (19.1600 ±3.01939), Kicking on a stationary ball for distance mean and standard deviation (34.3400±7.71325), 30-meters dribbling mean and standard deviation (5.9650±.55866), and Tackling 1 Vs 1 in limited area mean and standard deviation (6.0400±1.47025). And correlation among the soccer skill tests is that ground pass on a stationary ball for accuracy ($r = .226$), kicking on a stationary ball for distance ($r = .389$), 30-meters dribbling ($r = .076$), tackling 1 Vs 1 in limited area ($r = .103$). The combined of these four soccer skill tests shows higher significant relationship.

Conclusion: The soccer skills test developed by the researcher has the capacity to expect the objective skill test of soccerplayers.

Keywords: Soccer skills, Skill tests, Dribbling, Tackling

INTRODUCTION

The clear aim of a soccer match is to score more goals than the opposing team (Ali A. 2011).^[1]As a result, soccer shooting (kicking) ability, which includes both shooting speed and shooting accuracy, represents one of the most important soccer – specific movement qualities (Jinshen, 1993).^[2]Nowadays, with the demand for “high sports performance,” the concept of soccer has been changed. The literature shows that conditional abilities and soccer skills are important pre-requisite for efficient soccer performance. Genetic factors may also play a major role in the performance capacity of a soccer player (Singh LS, et al. 2018).^[3] A soccer player’s body composition is particularly important for performance because of body components (bone, muscle

and fat). Soccer optimum performance is also related to the players' body composition (Singh, WJ et al., 2020).^[4] Soccer (association football) is a popular team invasion sport where many youngsters pursue their aspirations of becoming elite performers (Simonton DK, 1999 and Zago, M., 2016)^[5-6]. The concept of “Total Soccer” applies skill development, tactical development, development of all-important motor components, and physiological parameters that are closely associated and contribute to soccer performance. Not only the technical, physiological and physical development, the sports scientists are also making efforts to develop the intellectual ability of the soccer players (Singh LS, 2016).^[7]

METHODOLOGY**Selection**

of Subjects

To achieve this objective, a total of 50 male soccer players (12 to 16 years) were randomly selected from the Tiddim Road Athletic Union (TRAU), Imphal West, Manipur who are regularly practices in their respective academy.

Selection of Specific Skills Test Item

The specific skill test items are selected on the basis of their importance on the game. These items are:

1. Ground Pass on a Stationary Ball for Accuracy
2. Kicking on a Stationary Ball for Distance
3. 30 Meters Dribbling
4. Tackling 1 Vs 1 in a Limited Area

Administration of the test

The test was administered to the subjects of the Tiddim Road Athletic Union (TRAU), Imphal West, Manipur. Prior to the actual administration of the testing program all the subjects were properly instructed regarding the procedure of the test. All the subjects had been also informed about the objective of the study.

1. Ground Pass on a Stationary Ball for

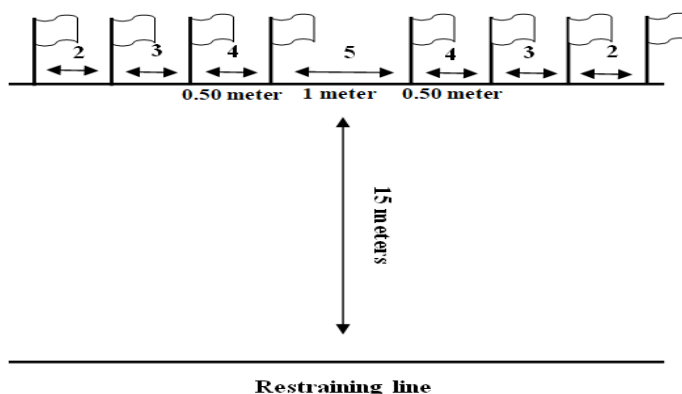


Fig. No.1: Ground Pass on a Stationary Ball for Accuracy

2. Kicking on a Stationary Ball for Distance

Objective: To measure the kicking ability for distance.

Facilities & Equipments: Soccer balls, measuring tape, marking for the test and playing field.

Procedure: A restraining line was drawn on one side of the ground, as shown in Fig. No. 2. The subject put a ball behind or on the restraining line. After that the subject ran forward and kicked the ball in the air

Accuracy

Objective: To measure the accuracy of passing with foot.

Facilities & Equipments: Soccer balls, 8 flag posts, marking for the test and playing field.

Procedure: The subject was asked to pass the ball with the foot (any ground pass) lying behind or on the restraining line to the target along the ground. 8 flag posts were fixed in straight line as the target. The distance between the two middle flag posts is 1 metre and 0.50 metre for the remaining flag posts. 15 metres away and opposite to the middle flag posts, a line was marked from where the balls were kicked towards the target as shown in Fig. No. 1. If the ball did not pass between the two extreme flag posts i.e. off-target, 0 point was given to the subject. If the ball did not roll along the ground, another trial was given.

Scoring: The points were given according to the area where the ball passed through. The ball hit any of the flag posts; the adjacent higher point was given. The total point of 5 trials was taken as the score of the subject.

as far as he could. The subject might use any part of his foot except toe. If the ball did not crossed 40m distance in the air from the restraining line, 0 point was given to the subject.

Scoring: The distance between the restraining line and the spot where the ball landed was measured in the nearest meter. 5 trials were given and the best distance of 3 trials was recorded as the score of the subject.

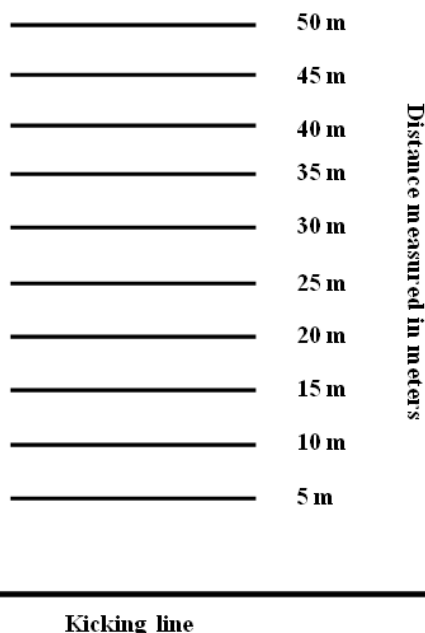


Fig. No.2: Kicking on a Stationary Ball for Distance

3. 30 Meters Dribbling

Objective: To measure speed in dribbling.
Facilities & Equipments: Soccer balls, stopwatch, measuring tape, chalk powder and playing field.
Procedure: A starting line and a finishing line with 30 meter distance in between were marked. A maximum of 2 subjects was tested at a time. The subjects were permitted to take standing start with the ball. At the starting signal “Go” the subject were asked to dribble the ball to cover the

distance of 30 meter in the shortest time as shown in the Fig. No. 3. The subject has to run as fast as he can, across the Finishing Line. The subject was asked to touch the ball at least 4 times during the course, otherwise the trial was repeated again.
Scoring: The timing from the starting signals till the subject and ball crossed the finishing line was recorded in 1/100th of a second. The best timing out of 5 trials was taken for the score.

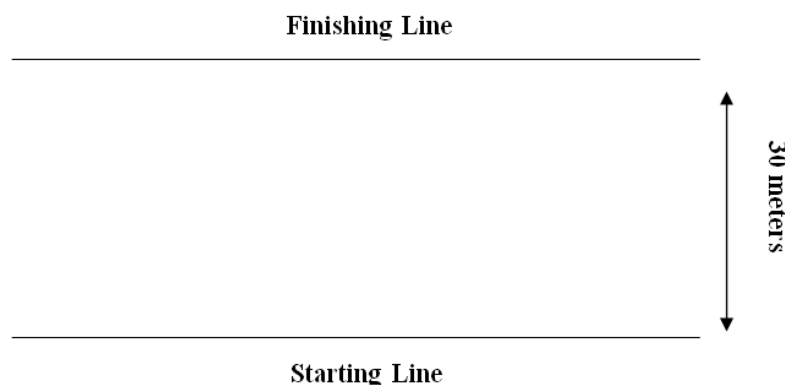


Fig. No. 3: 30 Meters Dribbling

4. Tackling 1 Vs 1 in a Limited Area

Objective: To measure the tackling ability.
Facilities & Equipments: Soccer balls, stopwatch, marking for the test and playing field.
Procedure: A 10 meters wide and 15 meters long rectangular court was drawn. The subject (defender) stood on the end line facing the attacker who stood at the

start line with the ball as shown in Fig. No. 4.
 To start the test, a server who was standing 8 meters away diagonally in the side line of the grid pass the ball to the attacker. Simultaneously, the defender (subject) move inside the court. The attacker moved forward inside the court with the ball. The task of the attacker was to dribble and past the defender (subject) within the court and

cross the opposite 10m line (end line) with the ball within 30 seconds. Whereas the task of the defender (subject) was to foil the attempt of the attacker and put the ball outside the court. 10 trials were given to each subject with different opponents (attackers).

Scoring: 1 point was given to the subject,

if he could tackle successfully i.e. sending the ball outside the court within 30 seconds. If the attacker crossed the opposite 10m line with the ball or kept the ball possession within the court for 30 seconds or more, the subject was awarded 0 point. The total point of 10 trials was recorded as the score of each subject.

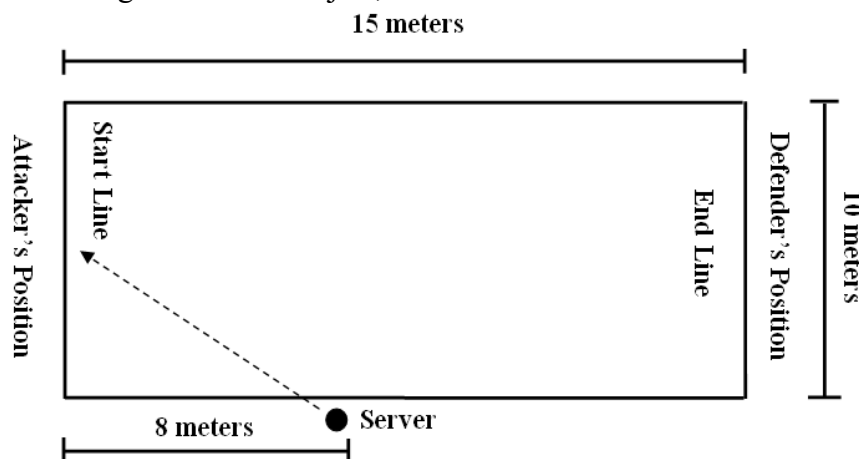


Fig. No.4: Tackling 1 Vs 1 in Limited Area

Criterion Measures

The following criterion measures are chosen for the administration of skill test items for

constructing objective skill test for football players:

Table No. 1: Criterion measures for the administration of skill test items for constructing objective skill test for soccerplayers

Sl. No.	Skill Tests	Criterion measures
1.	Ground Pass on a Stationary Ball for Accuracy	Number of scores/points
2.	Kicking on a Stationary Ball for Distance	Recorded in Meters
3.	30-Meters Dribbling	Seconds
4.	Tackling 1 Vs 1 in Limited Area	Number of Points

Collection of Data

For the collection of data 50 male soccer players were purposively selected from the Tiddim Road Athletic Union (TRAU), Imphal West, Manipur. The data was collected for each skill by administering their respective tests. The test was administered for soccer skills at football field with proper equipment & supervision of experts.

Statistical Procedure

For the development of specific soccer skill tests, Pearson correlation and factor analysis was used for developing the selected soccer skill tests item on the basis of player's high magnitude of correlation co-efficient.

Analysis of data

On the basis of collected data four independent variables were correlated

ve statistics, Pearson correlation in order to investigate the relationship of each independent variable. The factor analysis was developed in order to assess the contribution of each item separately.

Reliability of Data

The reliability of data was ensured by establishing instrument reliability and tester's competency on the test administration. For that purpose 10 subjects who possessed similar characteristics with the larger group of the main study were chosen randomly for pilot testing the instruments' reliability and tester's competency. The subjects were tested on soccer skills within a gap of two days. The correlations between the two tests were given on table 2.

by description

Table 2:Indicates that the four skill tests have the significant relationship with the criterion variables.

Sl. No.	Variable correlated	Correlation coefficient
1.	Ground Pass on a Stationary Ball for Accuracy	.80*
2.	Kicking on a Stationary Ball for Distance	.83*
3.	30-Meters Dribbling	.82*
4.	Tackling 1 Vs 1 in Limited Area	.86*

*Correlation is significant at the 0.05 level

Discussion and Finding

For finding the descriptive statistic of selected soccer skill tests are given in the following table:

Table 3:Mean and Standard Deviation of selected soccer skill tests.

Selected Soccer Skill Tests	Mean	Std. Deviation	N
Ground Pass on a Stationary Ball for Accuracy	19.1600	3.01939	50
Kicking on a Stationary Ball for Distance	34.3400	7.71325	50
30-Metes Dribbling	5.9650	.55866	50
Tackling 1 Vs 1 in Limited Area	6.0400	1.47025	50

Table No. 3 revealed that the descriptive statistics and significant relationship between soccer skills i.e., Ground pass on a stationary ball for accuracy mean and standard deviation (19.1600 ±3.01939), Kicking on a stationary ball for distancemean and standard deviation

(34.3400±7.71325), 30-meters dribblingmean and standard deviation (5.9650±.55866), and Tackling1 Vs 1 in limited area mean and standard deviation (6.0400±1.47025). Further, the correlations among the soccer skill tests are given below:

Table No 4: Pearson correlation between selected soccer skills

Selected Soccer Skill Tests	'r'
Ground Pass on a Stationary Ball for Accuracy	.226
Kicking on a Stationary Ball for Distance	.389*
30-Meters Dribbling	.076
Tackling 1 Vs 1 in Limited Area	.103

*Correlation is significant at the 0.05 level (1-tailed).

Table No. 4 revealed that correlation among the soccer skill tests was that ground pass on a stationary ball for accuracy (r= .226), kicking on a stationary ball for distance (r = .389), 30-meters dribbling (r=.076), tackling

1 Vs 1 in limited area (r=.103). The combined of these four soccer skill tests shows higher significant relationship. The following details of the total variance explained are given below:

Table No. 5: Shows the total variance explained

Factor	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	.869	21.715	21.715	.854	21.355	21.355
2	.516	12.909	34.624	.531	13.268	34.624

Extraction Method: Alpha Factoring.

Further, the following factor loading of selected soccer skill tests with Varimax Method are given in the table below:

Table No. 6: Shows the factor loading with Varimax Method

Soccer Skill Tests	Factor	
	1	2

Ground Pass on a Stationary Ball for Accuracy	.651	
Kicking on a Stationary Ball for Distance	.617	
30-Meters Dribbling		.458
Tackling 1 Vs 1 in Limited Area		.532

Rotation Method: Varimax with Kaiser Normalization.^a

EV = Eigenvalues, %V = Percentage Variance, C.V. = Cumulative Variance

Table no. 6 revealed that factor loading Varimax in the factor 1, ground pass on a stationary ball for accuracy has .651, kicking on a stationary ball for distance has .617; in the factor 2, 30-meters dribbling has .458 and tackling 1 Vs 1 in limited area has .532

Discussion

The statistical analysis of data revealed that in the factor 1 has ground pass on a stationary ball for accuracy (.651), and kicking on a stationary ball for distance (.617). In factor 2 has 30-meters dribbling (.458), and tackling 1 Vs 1 in limited area (.532). It has contributed significantly toward the development of soccer skill tests for soccer players. The total soccer demands that the players should not only physically and technically proficient but skills are enough to contribute one of the best for the overall performance of the players and teams. The results of coefficient of correlation analysis indicate that it was possible to standardize an objective of soccer skill tests on the basis of selected test items.

Although, the game of soccer is the team game and there are certain players who are more inborn quality as to contribute their talent to an optimum performance of their teams. A player who is low in some characteristic must compensate by high proficiency in order to gain and the ideal combinations includes emphasis on kicking, dribbling, receiving, heading, feinting and ball sense. Lichtman, 2004^[8] suggested that the Soccer Ball-Juggling Test is a reliable and valid tool that assesses Ball-handling ability in soccer. The study of Singh, 1999^[9] shows that kicking for distance, 70m run, 1 mile run and WM agility run with ball contribute much to playing ability in football among motor fitness. Crawford, 1963^[10] found that the respective coefficients for validity and estimated reliability from split-half correlations were (1) 0.73, 0.89 (2) 0.58, 0.84 and (3) 0.45, 0.88. As noted, the best single test was the dribble test. 1.5 test 1+ test 2

+1.8 test 3 -123 was the multiple regression equation for the battery was found. On the other hand, Padro'n-Cabo et al. 2019^[11] found satisfactory relative and absolute reliability for speed dribbling, right foot juggling, short passing, shooting a dead ball right, shooting from a pass, heading in front, and heading right. However, reliability values for left foot juggling, chest-head-foot juggling, head-left-foot-right foot-chest-head juggling, long pass, and shooting a dead ball left tests were not strong enough to suggest their usage by coaches in training or sport scientists in research.

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THE QUESTION OF AUTONOMY IN HIGHER EDUCATION OF INDIA: AN OPINION POLL STUDY

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ABSTRACT

The higher education programme is the biggest service industry that deals with the development of the human resources of the world. The quality of higher education is always been a vital issue of concern in India; as the nation is struggling to uplift its quality. In this concern granting autonomy can be a possible solution to enhance the quality and relevance in Indian higher education. To investigate the issue the present study aimed to examine the importance of granting autonomy, factors hindering and stakeholders' perception of granting autonomy to higher education institutions. The study revealed that granting autonomy is one of the important ways to quality enhancement. It also revealed perplexed and blurred mind set among the stakeholders of higher education in India.

Keywords: *Autonomy, opinion poll, higher education, quality, controversy.*

1. Background of the Study

The concern of quality in higher education is an extensively conversed area. Although we are witnessing the hefty establishment of higher education institutions (HEIs), capacity building, and increasing enrolment in higher education (HE); quality attainment is still an important question. Research studies conducted by Bhuyan (2016), Baruah (2018), Singh (2011), Kanwar and Chakrabarty (2013), Bhattacharya and Pal (2016), and Altbach (2014) revealed that lack of quality is the foremost challenge of Indian HE system. Therefore, HEIs have failed to realize and meet the need and expectations of their stakeholders. Starting from the University Education Commission, many committees and commissions recommended and envisaged for quality improvement in the higher education sector of independent India. Recently passed National Education policy 2020 also made the vision for quality universities and colleges in the Indian HE system. It signifies that quality in HE is not attained yet and the government is striving for the same. The system of HE is going through an evolving stage and many anomalies existed those need to be solved out for achieving quality.

In this context, many renowned academicians have given stress on granting autonomy to the HEIs. The general meaning of autonomy is freedom, self-governance, and

independence. Autonomy in higher education refers to the state of self-governance, decision making, self-management, leading academic standards, and other activities by the institution without any external interference. Autonomy is a demanding and unattained issue of higher education institutions. An autonomous college has its right to admit students, recruitment of employees, decide course and content, teach, conducting examinations, evaluation, and other required activities to maintain quality education. It supposes to follow guidelines from the university and state government but not fully controlled by them. Therefore, autonomy to any college does not mean sovereignty. It does not make the college free from social objectives (Sankaran and Joshi, 2016).

In the present world, there is keen awareness among university leaders and policymakers that university autonomy is the keystone for an effective and efficient higher education sector (Bandyopadhyay, 2018). The Kothari Commission (1964-66) recommended institutional autonomy for promoting academic excellence. National Policy on Education of 1986 suggested that autonomous colleges should increase in number. HEIs of the countries like UK and Netherlands are largely free to decide on all organizational, financial, staffing, and academic issues. In India, autonomy is granted to the fewer number of institutes

based on the parameters of excellence in academic performance, the capability of self-governance, and enhancement in the quality of education. As of December 2019, there is a total of 109 autonomous universities and 747 autonomous colleges in India (UGC, 2019). In which, UGC has granted the autonomous status to the 60 HEIs those maintained high academic status in March 2018; including 52 universities, and 8 colleges.

2. Objectives of the Study

1. To analyse the need and significance of granting autonomy to HEIs of India.
2. To analyse the factors hindering in granting autonomy to HEIs of India.
3. To examine stakeholders' perception of granting autonomy to HEIs.

3. Methodology of the Study

The descriptive survey method was employed and both primary as well as secondary data were used in the present study. To fulfill the first two objectives, the investigator dealt with secondary sources such as articles, newspaper editorial, researches from journals, opinions by researchers, and government documents. To fulfill the third objective the investigator structured an opinion poll consisting of 10 statements for seeking opinion from different stakeholders. The samples of the study consist of 100 stakeholders (across the country) of higher education including students, scholars, teachers, and parents.

4. Analysis and Findings

4.1. Need and significance of autonomy in higher education

As per the recommendations of the National Policy of Education 1986 (Page 44), autonomous institutions are those having the right of governance to fulfill their objectives with less interruption from others, although connected. It is claimed that autonomy is crucial for the growth and development of higher education. The need and significance of granting autonomy to higher education explained here considering the statements given by different researchers, articles, and opinions given by experts.

Bandyopadhyay (2018) stated that institutions with greater autonomy have

delivered better performance consistently. At the same time, with low autonomy, the outcome of the university/ college seems to have gone down, as they lack even basic infrastructure and core resources like teachers. The honorable Supreme Court of India had delivered judgments invoking Article 19(1) (g) of the Indian Constitution which requires providing new guidelines for providing autonomy in the real sense.

Swaminathan (2014) stated that while expanding new horizons for higher education and strengthening the quality for relevance, autonomy can be considered a possible solution to enhance the quality and relevance, autonomy can be considered a possible solution to enhance the quality of education.

Malik (2017) states that there should be greater decentralisation within the university hierarchy; including empowering university deans and giving more autonomy to departments. Also, the responsibility for course regulation, examinations, and degree awarding should be given to affiliated colleges so that universities can focus on post-graduate programmes and research.

Sankaran and Joshi (2016) emphasised that it is important that academics are made free from the fetters of such controls and given autonomy to do what they are supposed to do: teaching and researching. Knowledge work requires a climate of trust and the spirit of trusteeship which can least be fostered by the compliance orientation we see today. The cultural ethos of our ancient nation of respecting knowledge and sacralising the process of knowledge generation and transmission are completely at odds with the bureaucratization we see today. Questioning is more important for the students than having answers to what the teachers ask. It is interesting to note that most great works of ancient India start with the student asking a question and the Master giving answers.

Remarkably, the Union Budget for 2017-18 has recognized the need for autonomy in higher education and has promised to undertake reforms in the UGC accordingly. The ministry proposed that good quality institutions would be enabled to have greater administrative and academic

autonomy. Colleges will be identified based on accreditation and ranking and given autonomous status.

From the above presentation it is clear that there is a need to move towards greater autonomy for higher education institutions in India and there should be less interference at all levels, in particular, in the appointments of key functionaries in the decision-making bodies of universities. Otherwise, it leads to compromise in the accountability of the institution. The autonomy in higher education is demanding for academic expansion, excellence, and innovations. It is said that autonomy helps institutionalize quality and accountability, thereby encouraging institutions to incorporate unique pedagogical developments and practices into the curriculum. In short, autonomy is essential for the performance of the institution from the perspectives of quality of academics as well as access and equity.

4.2. Factors hindering in granting autonomy to HEIs of India

The Indian higher education institutions are perceived to lack freedom of action in nearly all areas of organizational, financial, staffing, and academic issues. Two major factors disturbing the autonomy of Indian HEIs are restrictions as per the central/state government regulations and interference in operational decision-making. In government-funded universities, government influence on all the aspects through different regulatory authority including employee appointment, management, and affiliation system. Whereas private universities suppose to follow UGC guidelines and all rules of the private university act. As per those rules, the private institution has to be unitary in nature. Besides restrictions on the jurisdiction, there are regulatory restrictions over the mode of delivery, students' admission, source of funding, distance education. This is how institutional autonomy is affected and thereby limiting the scope of expansion.

Generally, our Indian education system is least supportive of internationalization. The net result is that despite significant growth, quality relevance and excellence remain as a major challenge

for higher education institutions (Gawl and Chaudhary, 2019).

There are systematic restrictions over the courses of higher education. There are different regulatory bodies for maintaining the system and these bodies are directly or indirectly controlling the programme. It is also observed that in a single course, there are numbers of regulatory authorities to control.

1. University Grants Commission
2. National Assessment and Accreditation Council
3. All India Council for Technical Education
4. National Council for Educational Research and Training
5. State Council for Educational Research and Training
6. National Council of Teacher Education
7. National Board of Accreditation
8. Department of Higher Education of the State Government
9. Parent University

The above-mentioned bodies are typically control-oriented, rule-based, and authoritarian. In accreditation of HEIs, NAAC follows the regulatory view and focuses on grading, rather than assisting the institutions to achieve quality and excellence. The process of accreditation is not keenly helping in unique academic experimentation, innovation, and creative thinking of the teacher and the student. Too many institutions for generating controls are also a burden to the national exchequer. The fetters and control in HE hamper teaching and researching. This also hampers the climate of trust and the spirit of the stakeholders.

Another important reason for the poor progress of granting autonomy to HEIs is the unwillingness of state governments to give up their power over to the colleges. Further, the teachers are also not fully ready to take for granted full responsibilities as granting autonomy will increase their workload. Moreover, institutions with private management are worried that they will have to find additional resources if autonomy is given (Sankaran and Joshi, 2018).

Moreover, there are chances of misuse of power by an autonomous institution in

terms of fee collection, course selection, and administration and therefore it may become autocratic or victim of its own success.

Autonomy shouldn't merely refer to freedom from government interference, but it must be linked with accountability and discipline (Bandyopadhyay, 2018). Remarkably, autonomy alone may not guarantee higher quality; it is intended to decentralize decision-making to create an educational endeavour where greater

expansion possible. For the successful implementation of autonomy, there is the requirement of a higher level of commitment among all the stakeholders of the institution.

4.3. Stakeholders' perception of granting autonomy to higher education institutions

The responses received from the opinion poll regarding granting autonomy to HE are reflected in the following table.

Table No. 1: Item-wise responses in percentage

Items	Responses in Percentage		
	<i>Agree</i>	<i>Disagree</i>	<i>Undecided</i>
1. Granting autonomy to higher education institutions can lead higher education towards excellence.	75	19	7
2. Autonomous institutions can provide better quality education than others.	66	24	10
3. Greater autonomy can lead an institution to autocratic management.	68	25	7
4. Financial autonomy to the institution will increase the fee structure of the course provided.	78	17	5
5. Employees of autonomous institution works with better trust-ship and motivation than others.	62	22	16
6. Essential expansion and innovation in higher education is possible through granting autonomy.	62	29	7
7. Granting autonomy to a large number of institutions will destruct the existing higher education endeavour.	57	34	9
8. The unique courses, instructional process, evaluation, and grading of autonomous institutions create a mismatch in the higher education system.	62	33	5
9. Autonomous institutions can provide student-centric education than others.	68	28	3
10. Stakeholders from an autonomous institution can succeed greatly than others.	60	24	16

From the above presentation it is clear that concerning the question of excellence in HE, 75% of the respondents agreed that granting autonomy to the higher education institutions can lead higher education towards excellence. About 19% of respondents disagreed with the

statement and nearly 7% of respondents answered as undecided. Similarly, regarding the matter of quality education, 66% of the respondents agreed that autonomous institutions can provide better quality education than others. Whereas 24% of the sample

disagreed with the statement and 10 percent of them stood neutral state. Regarding expansion and innovation in HE, 62% of the respondents believed that essential expansion and innovation in higher education is possible through granting autonomy. Whereas, 29% of them denied the statement and 7% of them were neutral. About the issue of student-centric education, 68% of the respondents agreed that autonomous institutions can provide student-centric education than others. While 28% of them nullified the statement and 3% of them showed a neutral position. Regarding the collaboration amongst stakeholders, 62% of the respondents believe that employees of autonomous institutions work with better trust-ship and motivation than others. Further, 60% of the respondents believed that stakeholders from an autonomous institution can succeed greatly than others. While 24% of them have disagreed and 16% of them responded as undecided.

Reflecting on the contradictory statements, 57% of the stakeholders agreed that granting autonomy to a large number of institutions will destruct the existing higher education endeavour. Similarly, 62% of the respondents agreed that unique courses, instructional process, evaluation, and grading of autonomous institutions will create a mismatch in the higher education system. Concerning the matter of management style, 68% of the respondents agreed that greater autonomy can lead an institution to autocratic management. Moreover, 78% of the respondents believe that financial autonomy to the institution will increase the fee structure of the course provided.

5. Interpretation

From the above analysis, it can be stated that the HE institution with self-management and self-governance works with greater motivation, spirit, and with unique standards. An autonomous institution can adapt and carry innovative, unique, upgraded, modified & on-time programme and practices than other institutions. This is how autonomy to HE institution can bring academic quality with expansion, excellence, and innovations. Therefore, granting autonomy to HE institutions can be a path to uplift the quality.

Institutional autonomy is an unattained issue of society as the number of autonomous colleges and universities is limited. There are some hindrances in the path of granting autonomy to India's HE institutions. These include ignorance from policymakers, unwillingness from the side of government, restriction of state and central government over the institution, multiple regulatory bodies, lack of readiness of the stakeholders, which are some factors responsible for the slow path of gaining autonomy by the HE institutions.

From the evaluation of stakeholders' perception, it is observed that they are not well confident and clear about the concept of institutional autonomy. More than 60% of the respondents have supported the issue of granting autonomy to HE institutions for better cause education. At the same time, they have shown uncertainty and fear as they believe that granting autonomy can lead an institution to autocratic, fees may rise, and unique courses, instructional process, evaluation can create mismatch in the existing higher education system.

6. Conclusion and Suggestion

The enhancement of quality in HE is very vital for the improvement of human resources and ultimately for the development of the nation. Granting autonomy is undoubtedly one of the important factors that can uplift the quality with innovation & expansion. For the successful implementation of autonomy, autonomy must be linked with accountability. Freedom must embrace discipline. The success of autonomy is seen when the right balance between autonomy and accountability is exercised. Moreover, there is a need for readiness among the staff of respective colleges and universities those claiming for autonomous status and they must commit to the society that they wouldn't misuse their power and status. It is also important to incorporate all kinds of pedagogical development and a well-managed system among the HE institutions regardless of their status. Government must windrow its unnecessary restrictions from higher education including its recruitment. It is fact that a person who works in a free and friendly environment can work better than a person who works under restrictions and pressures.

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AN EVALUATION OF OUTCOMES IN IMPLEMENTATION OF RIGHT TO EDUCATION ACT, 2009

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ABSTRACT

Educational problems and challenges in India are huge and have been continuing through the years. Both at the center and state level the problem exists in high scale even after 11 years the “Right to Education Act, 2009” has been enacted. The picture of the education system in India was in a worse stage as the eligible children for education had no means to continue their study. Though the situation is still in a vulnerable state, through the enactment RTE, it has changed in many parts of rural and urban areas. This article has taken the numerous features of RTE into account to illustrate the relevance of such act in India. Major purpose of this study is to mention the significance of this act regarding the education system in India. Role and responsibilities of this research article rectifies the importance of such acts as the fundamental right in order to enhance the education system of the country.

Keywords: RTE, Right to Education Act, Key features, compulsory education, fundamental right, Article 21

Introduction

The “Right of Children to Free and Compulsory Education Act” or “right to Education Act” (RTE) was enacted by the parliament of Government of India on 4th August, 2009 (Bhattacharya and Jiang, 2018). It describes the modalities of significance of compulsory free education for those children who are aged from 6 to 14 under article no 21 of the Constitution of India. India positioned itself as the one of those 135 countries who made the right of education as the fundamental right for their citizens (Rout and Sharma, 2018). The act came into force in the next year, on 1st April, 2010. Here, in this article the importance of the “Right for Education Act, 2009” has described briefly why free and compulsory education is necessary in India.

Importance of RTE

The “Right to Education Act, 2009” carries comprehensive standards in providing an implicative education system in the country. Here is the great importance of the RTE Act mentioned below.

1. Free and compulsory education for all

The act is obligatory to provide compulsory free elementary education to every child in the local or neighborhood school when they become eligible for receiving the education. Eligibility criteria bear the only condition that they must be

between the age groups from 6 to 14. No children have to bear the school fees or other charges. Under the criteria of free education, it includes free textbooks, stationary items, uniforms, and other educational material to reduce the burden of expenses.

2. Benchmark mandate and Special provisions to handle special case

It lays down the norms and standards regarding pupil-teacher ratio, separate toilets both for boys as well as girls, available classrooms, drinking water, school hours, number of working days for teaching and non-teaching staff in the primary schools and also in the middle school to maintain the standard in the education system. RTE mentions that the school dropouts and the children who have not received education within school boundary should be put in their age-appropriate class, and mandates that they should provide a special training and courses to enable them to receive education in that level.

3. Quantity and quality of the teaching staffs and quality education concerning Zero tolerance against any kind of harassment and discrimination in elementary education

With the norms- suitable teacher-pupil ratio, the act also mandates to recruit trained and educationally qualified teachers in the elementary schools, and it puts effort to reduce the imbalance in the rural and urban

areas. RTE bears strong position against any kind of corruption, harassment and discrimination in the elementary education, hence no physical torture, discrimination among children's regarding fees and training can be bothered. The RTE Forum's Stocktaking Report, 2014 addressed throughout the respective country, there are 10% of elementary schools in the country who are continuing all the norms of this act (Malvankar, 2018). While the "Right for Education Act" was triggered to offer quality education concerning the privatization of education.

6. Justifiable Act and Creating inclusive field for all children

As RTE mandates free education for all the children nationwide who are between 6-14 ages irrespective of caste creed or other feature, it is identified as justifiable act.

The importance of the "Right to Education Act in India' 2009" is huge concerning the social or economic position of the country. Poverty rate in the year 2009 was more than 90 percent in the country (Kakati, 2018). It was not possible for the Indian household to continue their children's education; in such extreme poverty level the free education was necessary for the nation in high level. Other than the poverty level, there were other issues like racial discrimination. The Constitution of India has given fundamental rights, but it is the common picture that without proper education, all the Indian citizens are not capable to enjoy those fundamental rights, hence the importance and relevance of the "RTE 2009" is important and resourceful. Child labor ration in India between the age group from 5 years to 14 years counts 259.6 million, that is 3.9 % of the total children population in the country according to the census of 2011 (SINGH, 2019). It is greatly impactful for the future of the nation.

Features of Right to Education Act, 2009

"The Right of Children to Free and Compulsory Education Act, 2009" has been included under article 21 in the Constitution of India as the fundamental Right. The principle highlight of the RTE, 2009 includes-

1. It gives the assurance for compulsory along with free education to all those children who are in the age group from 6 to 14. No admission fees, capitation fees, or other educational charges have to be paid by those children for receiving the elementary education.
2. The children or their parents are not subjected for interviews or any kind of screening in the schools during the time of admission. The eligibility criteria for the elementary level school admission is only the age group, hence they can take admission in the local and neighborhood schools which are situated within 1 km from the residences of the children.
3. Special training for above six year old children who are dropped schooled for any reason, or has not taken admission yet, or those who discontinue their education for any reason must be provided when they are identified and admitted to their age relevant classes.
4. If any elementary school does not maintain the norms of RTE act, 2009 strict steps can be taken according to the zero discrimination tolerance features. Additionally, if a school cannot provide complete aid as per this act in the elementary education, the children can take transfer into any other government aided or government school without any kind of harassment.
5. Each of the children who take admission in the school must provide free textbooks, uniforms and other educational equipment. Central or state government must affiliate a school within every 1 km to provide education for class I-V and within 3 km for VI-VIII. This is termed as the neighborhood schools under this act.
6. The central government or the State government is liable for the right school mapping in order to determine the location to build a school accordingly. RTE mentions that 25 % of the total seats must be preserved in the local areas for those RTE students that are funded by the government. The state government and the central government possess joint responsibility to provide that fund.
7. Each state government bears the responsibility to recruit trained teachers and

maintain the proper teacher-pupil ratio both in the urban and rural areas, or any kind of teacher training, providing education to the parents about their children if needed. One teacher must be recruited for every 30 students for the I-V classes and it is 1:35 for the VI-VIII students (Joshi, 2020), and in every elementary school there must be one subject specialist teacher- for languages, mathematics, and for social science.

8. The school must ensure all-round improvement of the children without denying any children education.

Evaluation of Right to Education act, 2009

The “RTE 2009”, namely RTE Act came into force in April, 2010 prescribing norms for the elementary schools of India and prohibiting

the unrecognized schools from the list. The act significantly administered against the school fees or donation fees along with the clear declaration that, in the elementary level of education no interviews of the children can be conducted at admission time, hence all the children aged from 6 to 14 are eligible to take admission (Sethi, 2020). RTE put a regular check on neighborhood conducting surveys to identify those children’s who are eligible for occurring education but have not the means. The RTE Act bears the responsibilities for the states and centre, for all the territorial and local bodies to sort the gaps in the education system to improve the education system of the nation.

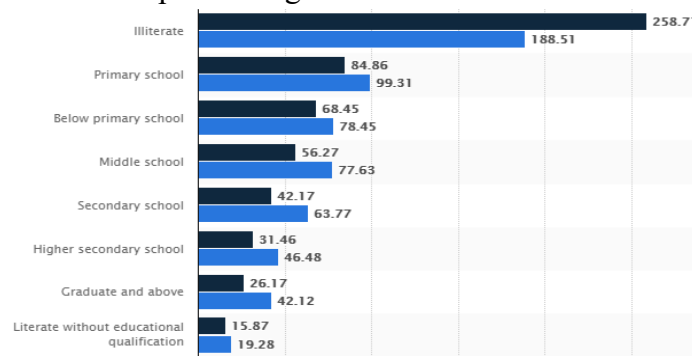


Figure 1: Literacy rate of India in different stage (in millions) (Census, 2011)

(Source: Inspired by Statistica, 2021)

It can be seen from the literacy scale according to the census 2011, there are 258.71 million illiterate people of the total population of India among which the ratio in the primary level, below primary level, and in the middle school, the illiteracy level is very high. The RTE act came into force in the year 2010; the picture describes the picture before the time of its enforcement. Figure 2 shows that the percentage of the school enrollment

during the time period 2007-2008 was 50,911,110, and during 2011-2012, it was 61,955,154, that is a 12% increase from the previous year when the act was just enforced. In the very first year it had faced a notable growth as just within a one year time period the ratio of school enrollment reached to 12 percent from 6,5 percent. In the next few years the growth point was parallel increasing till 2016 (Shah and Steinberg, 2019).

Year	No. of students enrolled in class VI-VIII (upper primary)	Year-on-year increase (in %)
2007-08	50,911,110	NA
2009-10	54,467,415	6.5
2011-12	61,955,154	12
2013-14	66,471,219	6.8
2015-16	67,593,727	1.7

Figure 2: Percentage of school enrollment throughout years

(Source: Inspired by Stastitica, 2021)

However, besides the national graph, the state wise increment differs from one another regarding the effectiveness of the Act. Bihar, Uttar Pradesh and Rajasthan have faced the incensement 6.5%, 1.1%, and 5.5 % respectively. Madhya Pradesh, and Assam gained 2.7% and 5.1%, on the other hand west Bengal had very less percentage, just 1.5% (Kumar *et al.* 2019). The enactment of RTE is not just in feat; rather it is still ongoing with further compliance and norms in the system.

Conclusion

Observing the key features and the evaluation of “Right to Child Act, 2009”, it can be said that in the immense poverty level of India the relevance of the RTE is extremely high. In a country like India, where

every household cannot gather the two-times meal properly, the education for the children is a challenging matter, here, the relevance of the application of such an act proves itself by the incremental enrollment percentage in the school in the later years from its enforcement. While free education was important for the children concerning poverty level, it is also implacable to reduce the childlabor and also for the reduction of child marriage. Most of the rural children are either recruited in works or married at the early of the stage. Identification and admission of those children through the implementation of this act is meaningful both from a social or economic point of view in establishing a better future for the nation.

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PER CAPITA INCOME-CONSUMPTION EXPENDITURE OF INDIVIDUALS IN KERALA: AN EMPIRICAL ANALYSIS

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ABSTRACT

The Indian economy was facing a slowdown before the pandemic hit the country. The savings rate in the country was drastically decreasing which affected both government and private investments. After the COVID-19 ruptured India's economy, the rate of unemployment is increasing. which will affect the aggregate demand of both rural and urban area and will lead to huge inequality in the nation. There is a strong positive correlation and super-multiplier impact between consumption, investment and saving in the economy. That is, all these three factors are essential for leading the country to economic development. Economy's capital formation is highly depending upon consumption expenditure of the people. Thus, the present study deals household consumption expenditure and various influenced factors faced by individuals in Kerala which will helps to understand the present Kerala's aggregate demand scenario and trend. The study examines the Average Monthly Per capita Consumption Expenditure and to identify various factors influencing consumption expenditure of individuals. The present study applied quantitative approach. Different tools like Descriptive statistics, Factor Analysis, Multiple Regression Analysis, ANOVA etc are used to analyse the present study.

Keywords: Consumption, Aggregate demand, Per capita income, Youngsters, Middle -age, Economic growth

Introduction

The ensure and confidence Indian economic growth has been climbing up in recent years back. This has directed to revival and rethinking about saving ratio, investment level and growth in India. After the year 2015 the economic situation of India was changed, the Indian economy continues to slowdown, the country even worried about the lack of resources and economic activity. The combined merchandise and service export of India in April 2020 are estimated to be USD 27.96 billion, which was a negative growth of (-) 36.65 per cent while comparing with the last year.

The economic volatility during COVID-19 creates multi-dimensional and linkage effects. The lockdown measures put forwarded by the government of India created a large demand shock in the economy. There is significant uncertainty about lives and livelihoods as governments direct social distancing practices and instruct non-essential businesses to close to slow the spread of the outbreak (Aduhene, D. T. Osei-Assibey, E, 2021). It is projected that the reduction in foreign demand and domestic consumption demand will lead to substantial job losses in both the formal and informal sectors in India (Anuragh Balajee, 2020). In all over the countries around the world, the importance of

consumption demand, domestic saving and investment is needed to encourage economic growth and it has received a considerable attention. The Lewis's traditional theory (1955), proved that there is a positive correlation between saving and economic growth whereas in the Harrod-Domar models proved that economy's investment level creates a positive impact on economic growth. The other major theories where, the neoclassical Solow (1956) model which proves that the upsurge in the saving rate enhance effective output by more than its direct impact on investment (Jangili, 2011). Thus, from the proved model it is clear that, there is strong linkage effect between consumption, saving, investment and economic growth.

The COVID-19 crisis will further worsen the condition as the economic freedom of the majority in India will decrease as unemployment is at an all-time high. According to Phillips curve, there exists a trade-off between inflation and unemployment that is as inflation increases, unemployment decreases but during the COVID-19 crisis both unemployment and inflation increased simultaneously (stagflation). Unemployment decreases the income in hand of the people which decreases the consumption, domestic savings and it turn to decelerated investment. As investment decreases output

decreases which will create more unemployment. Thus, the economy had been confronting vicious circle and it continues. This will further slowdown the Indian economy and will lead to an economic trap. India's growth story has been driven by the consumption. Aggregate consumption or aggregate demand is the base of capital formation and further level of saving. Macroeconomists consider an association between consumption and other important variables to understand the employment, income growth, capital stock, savings and investment. The standard of living of the people is even depended upon the pattern and volume of consumption (Maithily, 2008). The consumption by the people increases as there is an increase in income or income anticipation which will in turn increase the economic growth (Keynes, 1936). The study deals with an in-depth analysis of the household consumption which will draw an outline about the present micro economic situation. Thus, in the present scenario of economy, it is very significant to identify the level of consumption of expenditure and various

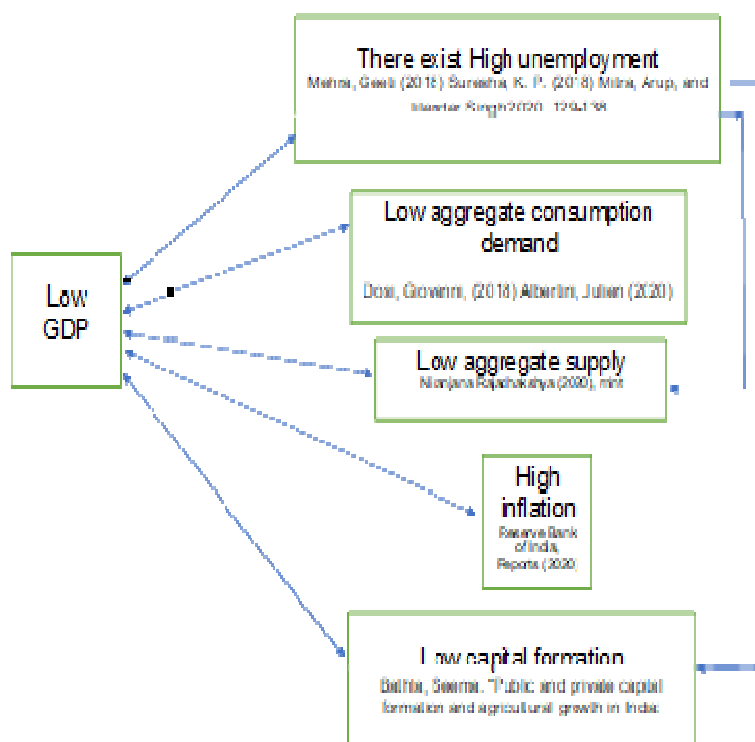
influenced factors of consumption expenditure. Thus, the present study also focussed on these aspects.

The problem statements

The Indian economy was facing a slowdown before the pandemic hit the country. After the COVID-19 ruptured India's economy, the aggregate demand is going down due to high unemployment. The highest driver for economic growth in India is consumption demand. The Private Final Consumption Expenditure (PFCE) had a share of 57% in India's GDP in 2019- 20 and PFCE growth collapsed to 2.7% in the March 2020 quarter, the lowest since June 2012 (Kishore, 2020). It is important for India to boost its aggregate consumption demand in order to pick up the economy from slowdown which will affect the investments in the country. The former planning commission member Abhijit Sen stated that a fall in food spending especially in rural areas shows the increase in percentage of malnutrition which will in turn affect the welfare of the society. In the present study, the research problem elaborated through figure 1.1

Figure 1.1

Statement of the problem: Graphical representation



In an ageing world India's population is among the youngest. In 2022, 28 years will be the median age in India. It's the demographic dividend that helped some Asian countries to achieve spectacular growth (Ghosh, 2020). India is facing the highest unemployment rate after 45 years as it rose to 6.1 percentage in 2017-18. The COVID-19 ripped off the Indian economy, the growth rate of

the country fell down drastically which in turn affected the aggregate demand of the country. The present unemployment rate in rural and urban India is increasing which will affect the aggregate demand and will increase the inequality in the nation. The economy can bounce back only by increasing the investment and that can be done by increasing the household consumption demand

and savings. Thus, the present study trying to examine the household consumption expenditure of individuals. The study will also help us to understand the economic development of the area where it is conducted. The study is conducted to know the household consumption pattern of the people living in the geographical area of the state of Kerala.

Research Questions

1. What are the Average Month -wise Per-capita Consumption Expenditure (MPCE) of youngsters and middle age groups
2. What are the various factors influencing consumption expenditure of individuals, especially youngsters and middle age groups

Objectives of the study

1. To examine the Average Month wise Per-capita Consumption Expenditure (MPCE) of youngsters and middle age groups

2. To identify various factors influencing consumption expenditure of individuals, especially youngsters and middle age groups
- Hypothesis of the study

1. Ho: There is no relation between various factors of consumption and consumption expenditure

Method and Methodology

The study includes primary data analysis. The primary data is collected by questionnaire Method through Random sampling Method. Sample size is determined through the Krejcie-Morgan tool which consider margin of error 5 per cent with 95 per cent confidence. As per the Krejcie-Morgan tool, the selected sample size includes 384 in which consist of 192 youngsters and 192 middle-age categories. Different tools like Descriptive statistics, Factor Analysis, Multiple Regression Analysis, ANOVA, Chi-square test and Structural Equation Modelling are used to analyse the present study.

Analysis and Result summary of Consumption expenditure of individuals in Kerala.

Table-1 The detailed explanation of sample population Total No. of Observations							
		Age	Gender	Area Residence	of Education	Employment	Income slab
N	Valid	384	384	384	384	384	384
Age category							
		Frequency		Percent		Cumulative Percent	
		18-34	187	48.7		48.7	
		35-55	197	51.3		100.0	
		Total	384	100.0			
Gender							
		Frequency		Percent		Cumulative Percent	
		Male	237	61.4		61.4	
		Female	147	38.6		100.0	
		Total	384	100.0			
Income slab							
Employment							
		Frequency		Percent		Cumulative Percent	
		Govt Sector	90	23.4		23.4	
		Private Sector	180	48.2		71.6	
		Unorganized Sector	72	18.8		90.4	
		Business	38	9.6		100.0	
		Total	384	100.0			
		Frequency		Percent		Cumulative Percent	
		Annual Income 1-2.5 Lakh	128	32.5		32.5	
		Annual income 2.5-5 Lakh	132	33.5		66.0	
		Annual Income 5-10 lakh	134	34.0		100.0	
		Total	384	100.0			

The Average Monthly per-capita Consumption Expenditure of Youngsters and Middle age group

The average monthly per-capita consumption expenditure is the amount of money spent for

consuming both durable and non-durable goods in a month by an individual. Usually, the average monthly per capita consumption expenditure is high for the poor people and low for the rich people in our society.

TABLE 2 YOUNGSTERS AVERAGE MONTHLY CONSUMPTION EXPENDITURE					
Below 2.5 Lakhs		Between 2.5-5 Lakhs		Between 5-10 Lakhs	
Non-Food	Food	Non-Food	Food	Non-Food	Food
5133.24	3454.77	6659.89	5290.22	9857.86	8006.5
MIDDLE-AGE AVERAGE MONTHLY CONSUMPTION EXPENDITURE					
Below 2.5 Lakhs		Between 2.5-5 Lakhs		Between 5-10 Lakhs	
Non-Food	Food	Non-Food	Food	Non-Food	Food
3577.41	2628.17	4384.51	4005.07	8524.11	5525.38

Table 2 The average monthly consumption expenditure of individuals for various Food and Non-Food item.

From the above data, it is found that the average consumption expenditure of youngsters is higher than the average consumption expenditure of middle age group. The share of consumption in non-food items is more than the consumption of food items.

Determinant factors of consumption and its influence on consumption expenditure.

Clustering of consumption expenditure factors: Exploratory factor analysis

This segment is mainly used to explain and analyse various factors of consumption. It is used to explore the clusters of consumption factors of individuals through principal component method with varimax rotation. Table 3 Explain about the reliability analysis of consumption expenditure factors.

Table 3 Reliability analysis of consumption expenditure factors

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.611
Bartlett's Test of Sphericity	Approx. Chi-Square	7373.589
	Df	276
	Sig.	.000

Source: computed from primary data

The result of the two tests KMO measure of sample adequacy and Bartlett's test of sphericity to test whether the relationship among various

factors of consumption is significant or not. The present study KMO result shows that 0.611 test statistics, that is the selected factors are found to be suitable with statistical significance.

Table 4 Clustering of various factors of consumption expenditure

Factor	Parameters	Rotated Factor Loadings
Factor 1: Economic	Monthly Income	.876
	Permanent Asset	.713
	Availability of Credit	.864
	Price of Products	.891
	Change in Interest Rates	.899
	Savings and Investment	.846
	Expected Income	.785
	Debt Payment	.889
2. Personal Factors	Other Economic Factors	.663
	Dependency Ratio of Family	.795
	Healthcare Expenditure	.861
	Age of the person	.834
	Lifestyle	.874
	Beliefs	.779
	Attitude	.779
	Other Personal Factors	.699
3. Social Factors	Neighbour's Lifestyle	.794
	Role in the Society	.813
	Status	.827
	Media/Advertisements	.836

	Offers and Discounts	.794
	Brand value	.683
	Other Social Factors	.842

For the factor analysis out of 23 consumption factor parameters 3 factors have been extracted that is economic social and personal. It shows that there is a strong relationship between various consumption factors and consumption expenditure of an individual.

Table 5 Economic factors and consumption expenditure of an individual.

Economic Factors	Mean
Monthly Income	4.4974
Permanent Asset	3.4036
Availability of Credit	3.9453
Price of Products	4.0677
Change in Interest Rates	2.5365
Savings and Investment	4.0391
Expected Income	3.3490
Debt Payment	2.9766
Other Economic Factors	3.2109

In the above-mentioned economic factors, the highest influencing factor on consumption is monthly income which have a mean value of 4.4974 and the second most important factor is price of the products. The economic factors that affect the least is change in interest rates and debt payment.

Table 6 Personal factors and consumption expenditure of an individual

Personal Factors	Mean
Dependency Ratio of Family	4.4609
Healthcare Expenditure	4.1458
Age of the person	3.8177
Lifestyle	3.7917
Beliefs	3.2031
Attitude	3.9818
Other Personal Factors	2.9661

The personal factor that affects the most in the consumption of an individual is dependency ratio of family with a mean value 4.4609. Another important factor that affects the consumption is healthcare expenditure which has a mean value of 4.1458.

Table 7 Social factors and consumption

expenditure of an individual

Social Factors	Mean
Neighbour's Lifestyle	3.1042
Role in the Society	3.2083
Status	3.2526
Media/Advertisements	3.8073
Offers and Discounts	4.0104
Brand value	3.6432
Other Social Factors	2.9948

Among the social factors, the most important one that affects the consumption of an individual is offers and discount. Demonstration effect can also be seen with a mean value of 3.1042. The second most important personal factor that affects consumption is media and advertisements.

Influence of various factors on consumption expenditure of youngsters: Empirical Analysis

In this section we consider the influence of various factors on youngsters and the middle-age group separately. This study is conducted to know whether there exists a difference in rate of influence of factors with respect to the age group.

Table 8: Influence of various factors on consumption expenditure of youngsters.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.941 ^a	.885	.883	.505

a. Predictors: (Constant), Personnel, Social, Economic

ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	376.016	3	125.339	491.245	.000 ^b

Residual	48.733	191	.255		
Total	424.749	194			
a. Dependent Variable: consumption Expenditure					
b. Predictors: (Constant), Personnel, Social, Economic					

Coefficients						
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error				Beta
1	(Constant)	.201	.070		2.887	.000
	Social	.949	.025	.941	38.581	.000
	Economic	.909	.034	.885	26.440	.000
	Personnel	.886	.040	.847	22.105	.000
a. Dependent Variable: consumption Expenditure						

Multiple regression coefficient measures the relationships between dependent and independent variables. (Armstrong & Scott, 2012).

H_0 : consumption factors have no influence on consumption expenditure of youngsters

Here the multiple regression analysis for consumption expenditure of youngsters (Y) was performed with 3 independent variables and it considered as various influenced factors of consumption like economic factors (X_1), personal factors (X_2), Social factors (X_3).

$$Y = a_0 + b_1X_1 + b_2X_2 + b_3X_3 \dots (1)$$

$$Y = a_0 (.201) + b_1X_1 (.885) + b_2X_2 (.847) + b_3X_3 (.941)$$

Where b is the Unstandardized beta coefficients of each variable and a_0 is a constant value. The present analysis also identified that there is no multi-collinearity exists among the selected 3 predictor variables. The factors have 88.3 percent influences on consumption expenditure of youngster in Kerala with statistically significant result. Thus, the null hypothesis is rejected and accepted research hypothesis.

Influence of various factors on consumption expenditure of middle age: Empirical Analysis

Table 9: Influence of various factors on consumption expenditure of Middle-age group

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.887 ^a	.786	.783	.689
a. Predictors: (Constant), Personnel, Social, Economic				

ANOVA				
Model		Sum of Squares	df	Mean Square
1	Regression	334.014	3	111.338
	Residual	90.734	191	.475
	Total	424.749	194	
a. Dependent Variable: consumption Expenditure				
b. Predictors: (Constant), Personnel, Social, Economic				

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error			
1	(Constant)	.551	.135		4.090	.000
	Economic	.904	.039	.856	22.956	.000
	Personnel	.896	.043	.834	20.970	.000
	Social	.904	.054	.770	16.748	.000
a. Dependent Variable: consumption Expenditure						

Here the multiple regression analysis for consumption expenditure of Middle age (Y) was performed with 3 independent variables and it considered as various influenced factors of consumption like economic factors (X_1), personal factors (X_2), Social factors (X_3).

$$Y = a_0 + b_1X_1 + b_2X_2 + b_3X_3 \dots (1)$$

$$Y = a_0 (.551) + b_1X_1 (.856) + b_2X_2 (.834) + b_3X_3 (.770)$$

Where b is the Unstandardized beta coefficients of each variable and a_0 is a constant value. The present analysis also identified that there is no

multi-collinearity exists among the selected 3 predictor variables. The factors have 78.3 percent influences on consumption expenditure of youngster in Kerala with statistically significant result. Thus, the null hypothesis is rejected and accepted research hypothesis.

Conclusion

The economic development of the country is highly correlated to aggregate consumption expenditure of the country. The present study examined the consumption expenditure of individuals in Kerala. The study conclude that average monthly per capita consumption expenditure is high for the poor people and low for the rich people in our society. The age-wise study shows that the average consumption expenditure of youngsters is higher than the average consumption expenditure of middle age group. Here also conclude that the share of consumption in non-food items is more than the consumption of food items.

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CITIZENS' PERCEPTION TOWARDS SMART CITY PERFORMANCE UNDER "WELL-BEING": A STUDY

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ABSTRACT

Smart City is a innovative and futuristic approach to address many problems arises due to urbanisation, population complexities, waste management and economic disorder. The smarter use of technologies in the city to provide quality of life, health, and sustainability is the object of Smart City development. This concept leads to the restructuring of socio-economic and ecological performance in the cities. This paper is an attempt to examine what actually citizens of the city perceive about the "well-being" objective under Smart City Performance defined by OECD,2020. Total 201 samples were collected from Raipur City of Chhattisgarh India. The results indicated that people satisfied with the three indicators of job, community and health dimensions namely satisfied with their job, people satisfied with affordability of the houses and people find someone when need identified with maximum mean scores through descriptive statistics by using SPSS 25 version. The result of the survey indicates that citizens' perception is positive towards all the 11 dimensions of well-being given by OECD,2020.

Key Words- Smart City, Technology, Well-being, Perception, Citizen, Urbanisation, City

1. Introduction

A smart city is an urban visualisation that promotes and integrates technology with citizens' engagement in a city. Urbanisation is a consequence of economic growth. Shift from agriculture to industrial based work and service sector are some of the reasons for increased urbanisation. This urbanisation is doubled in the last twenty year (till 200-21) and reached about 550 millions (niti.gov.in). This increased .

The core of the Smart City lies in the use of technology to enhance the services, quality of life, and resident's need. Prosperity, economic growth, and economic opportunity of a region strongly bank on Smart City. technologies can have a profound impact on the prosperity of a region. The increased urbanisation and vast population growth give rise to complexities and economic uproar (Cisco Report 2013). This results in unorganised urban growth (Johnson, 2008) and many problems with respect to health, safety, environment, pollution, traffic etc come apart (Toppeta 2010; Washburn, Sindhu, Balaouras, Dines, Hayes, & Nelson 2010). This chaos needs to be addressed through the use of technology in a smarter way, which formulated the concept of Smart City.

Many researchers have made an attempt to study Smart City with technology and data driven structure, challenges, and characteristics but there is scarcity of survey-based research with respect to smart City. This study tries to examine the citizens' perception towards one of the objectives of Smart City performance named as "Well-being". There were four objectives under Smart City performance namely well-being, inclusion, sustainability, and resilience. Out of the four one of the objectives as well-being is addressed. There were 11 indicators of well-being taken for the study and based on its indicators. Citizens' perception was taken towards perception of well-being.

2. Review of Literature

2.1 Smart City

Technology lies in the core concept of smart city united with social and human capital development. Hence, it is an integrated system (Monzon, 2015). Although the concept of Smart City was presented in 1994, At the earliest Smart city refers to "informational or cybernetically planned cities" as per the concept of Graby in 1960 and similarly afterwards in 1980s smart city referred to the "networked cities" or "computable cities". The Smart City concept was introduced in 1994 (Dameri and

Cocchia,2013) Later, by 2010, the European Union (EU) began to use the “smart” wording to refer to sustainable projects and actions related to the urban environment (Dameri and Cocchia,2013). With the appearance of Smart City project implementations supported by the European Union (EU), the interest regarding the subject began to increase significantly (Ahvenniemi et.al.2017)

With growing number of research, the most widely acceptable concept of Smart City by the researchers is the contribution of technology in the urban development (Mora and Deakin, 2019, Mosannenzadeh, F.; Vettorato, 2014)

Numerous research contributes that the key element behind the Smart City is “Sustainability” (Akande et. al.2019, Sharifi 2019) or “Sustainable City” and the objective of the smart cities is to enhance the sustainability with the help of technology (Ahvenniemi et.al.2017. However, technology is the core concept behind Smart City which is united with the human and social development. Three major aspects include innovation in management of city, its infrastructure, and its services.

A wide-ranging approach towards development and management of city lies in the definition of smart city. The concept

considers an all-inclusive way of solving the urban problems by considering the technology (Nam and Pardo, 2011; Batty et al., 2012).

Economic security and public safety is ensured by Smart City and hence, enables a better quality of life (Musa, 2017). Smart City integrates technology with infrastructure of the city (Musa, 2016)

2.2 Dimensions of Smart City Performance

OECD, 2020 proposed a Smart City framework which turns around the three pillars. First pillar describes about Smart City tools, second pillar talks about stakeholders’ engagement and third talks about the core objectives of the Smart City. This paper is based on the third pillar which discuss about the Smart City Performance. This measures what is the impact of digitisation on well-being, inclusion, sustainability, and resilience. These four are the suggested indicators of Smart City performance. This paper is based on the Citizens’ perception towards well-being performance indicator of Smart City. This indicator consists of 10 dimensions including job, income, housing, access to services, education, political participation, health, environmental quality, personal safety, community, and life satisfaction(OECD, 2020)

Table 1. Empirical Studies on smart City Performance

Author	year	Key Focus	Major Findings
Georgiadis et. al.	2021	A survey was conducted to evaluate the perception of citizens in the Greek City about the Smart City	Citizens perceived that there was no effort made to make the city smart and coordination between public and private sector was the biggest challenge that need to be addressed for a smarter future.
Flak and Hofmann	2020	The positive and negative aspects of Smart Cities on human rights was studied by conducting a survey on citizens and municipal employees	Freedom of expression, equal access to public services, privacy and security are likely to be affected by Smart Cities
Zhao and Zhang	2020	Impact of smart city planning, and development based on data on the socio-economic development	Considered social progress though social livelihood, environment protection and employment generation

Macke et. al. 2	2018	To analyse and determine the perception of citizens about quality of life in a smart city.	Four factors would successfully contribute towards quality of life in a smart city, these are-socio-structural relationships, material well-being, environmental well-being, and community integration
WeSam Musa	2017	The impact of smart city on economic development	The smart city solution was obtained by focussing on areas like Economic Development, Public Safety, Energy & Environment, Infrastructure, and Transportation. There was direct and indirect contribution of Smart City on the economic growth of the city

2. Research Question

What is the perception of the citizens of Raipur City towards “Well-being” of Smart City on performance?

3. Objective of the study

It can be seen through literature review that only handful of studies have been conducted to study the impact of Smart Cities on Economic, social development or other aspects. Moreover, lesser studies are contributing towards the perception of citizens living in the city towards the performance of Smart Cities. This paper is an attempt to study the perception of Smart City performance. In other words, the opinion of the citizens of Raipur city was assessed about the level of smartness of their city under the concept of Smart City. These performance indicators were withdrawn from the OECD studies.

4. Rationale of the Studies

The concept of “Smart City” was introduced in India in the year 2015, and Raipur, the capital of Chhattisgarh state was one of the cities in India selected for Smart City project. The objective of Smart City is to promote sustainability and inclusiveness in

the city in order to provide quality of life, infrastructure, and sustainable environment to the citizen. Some of the major elements of Smart city is adequate water supply, solid waste management, electricity supply, IT connectivity and digitisation, affordable housing etc. to set an exemplary initiative in front of other cities (Mohua.gov.in) Here, this study is conducted to measure the citizens’ perception towards the effectiveness of performance of the Smart City. It also helps local governance policy makers and decision makers to set realistic goals and bridge the gap between expectations and realities of people.

5. Methodology

The study was designed to assess the opinion or perception about the Performance of the Smart City in the Raipur City of Chhattisgarh State of India. As mentioned earlier, this assessment of perception was based on the “Well-being” one of the objectives of Smart City performance suggested by OECD, the questionnaire was based on this dimension and its indicator. The survey was conducted, and data was collected with the help of this questionnaire.

Table 2. Research Variables and Instrument

Type of Variable	Name of Variable	Dimensions	Indicators	Source
Dependent	Well-being (Smart City Performance)	Jobs	Employment Rate (JOB1)	(OECD, 2020)
			People Satisfied with their job (JOB2)	
		Income	People with enough money to cover their needs (INCOME)	
		Housing	Overcrowding conditions (HOUSING1)	
			People satisfied with affordability of housing (HOUSING 2)	
		Access to services	Performance of public transport network (ACCESS TO SERVICE 1)	
			People satisfied with public transport (ACCESS TO SERVICE 2)	
			Average commuting time to place of work (ACCESS TO SERVICE 3)	
		Education	People from 25 to 64 with at least tertiary education (EDUCATION)	
		Political Participation	Voter turnout (POLITICAL PARTICIPATION)	
		Environmental quality	Exposure to PM2.5 in $\mu\text{g}/\text{m}^3$, population weighted (ENVORONMENT QUALITY)	
		Personal Safety	Percentage of population that feel safe walking alone at night around the area they live (PERSONAL SAFETY)	
			Transport-related mortality rates (deaths per 100 000 people) Percentage of population that have been assaulted or mugged in the previous 12 months	

			(PERSONAL SAFETY 2)	
			Transport-related mortality rates (deaths per 100 000 people) Percentage of population that have been assaulted or mugged in the previous 12 months (PERSONAL SAFETY 3)	
		Community	People satisfied with their city (%) People with someone to rely on in case of need (COMMUNITY 1)	
			People satisfied with their city (%) People with someone to rely on in case of need (COMMUNITY 2)	
		Life satisfaction	Satisfaction with life as a whole (LIFE SATISFACTION)	

6

. Survey Methodology and Analysis

The main purpose of this study is to investigate the perception that the citizens of Raipur, Chhattisgarh, India have with respect to the Smart City concept, and to present their perception about the existing level of “smartness” that seems in the city they are currently live. The level of “smartness” is founded on how much is each of the six pillars of Smart city is developed. At present, few cities in Chhattisgarh have probed into the smart City concept. Raipur is one of them. Hence, majority of the Cities in Chhattisgarh have not yet divided in the concept of Smart City. when concept of Smart City was introduced in India in 2015 under a particular leadership, then few cities in India have delved under this concept and Raipur is one of them. With these, after implementing a concept of Smart City in Raipur, a survey was conducted to examine the standpoint of

citizens regarding “Well-being”, one of the Smart City performance tools. 10 indicators were selected under this parameter as mentioned in table 2. For this a sample of 201 people (Citizen) was collected from various places o Raipur City covering the entire city. survey was conducted through structured questionnaire (OECD, 2020). By doing this, a conclusion can be drawn regarding the citizens’ perception towards “Well-being” performance indicators of Smart City. Some specific results can be withdrawn in the form of which well-being indicators has significantly perceived by citizens.

7. Data Analysis and Interpretation

The data was analysed through SPSS 25 version by using frequency statistics. Mean, SD and variance are calculated as indicated in table 2. The values are also presented through histogram.

Table 2. Mean, SD, and variance of Well-being indicators

Indicators of well-being	Mean	SD	Variance
JOB 1	1.50	.50124	.251
JOB 2	1.65	.47761	.228
INCOME	1.44	.49796	.248
HOUSING 1	1.47	.50075	.251
HOUSING 2	1.64	.48067	.231
SERVICE 1	1.54	.49900	.249
SERVICE 2	1.61	.48735	.238
SERVICE 3	1.54	.49900	.249
EDUCATION	1.55	.48613	.236
POLITICAL PARTICIPATION	1.62	.49172	.242
HEALTH 1	1.59	.49796	.248
HEALTH 2	1.55	.49796	.244
ENVIRONMENTAL QUALITY	1.61	.48853	.239
PERSONAL SAFETY	1.54	.49900	.249
COMMUNITY 1	1.59	.49268	.243
COMMUNITY 2	1.63	.48351	.234
LIFE SATISFACTION	1.58	.49445	.244

7.1 Percentage Analysis Table

The following tables from table 3 to table 19 is representing the frequency and percentage

of the valid response of the citizens in Raipur City.

Table 3. frequency and percentage of Employment Rate

		JOB1			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	100	49.8	49.8	49.8
	YES	101	50.2	50.2	100.0
	Total	201	100.0	100.0	

Table 3 is representing that 49.8 % of citizens agreed that employment rate is

satisfactory and 50.2 are not satisfied with the employment rate.

Table 4.frequency and percentage of job satisfaction

JOB2					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	70	34.8	34.8	34.8
	YES	131	65.2	65.2	100.0
	Total	201	100.0	100.0	

Table 4 is representing that 34.8 % of citizens agreed that people satisfied with their job and 65.2 are not satisfied with their job.

Table 5.frequency and percentage of income

INCOME					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	112	55.7	55.7	55.7
	YES	89	44.3	44.3	100.0
	Total	201	100.0	100.0	

Table 5 is representing that 55.7 % of citizens agreed that they have enough money to cover their need and 44.3% are not satisfied that they have enough money to cover their need.

Table 6.frequency and percentage of Housing (living in overcrowding condition)

HOUSING1					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	105	52.2	52.2	52.2
	YES	96	47.8	47.8	100.0
	Total	201	100.0	100.0	

Table 6 is representing that 52.2 % of citizens agreed that they are living in overcrowding conditions while and 47.8 do not agree with this.

Table 7.frequency and percentage of Housing (affordability of house)

HOUSING2					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	72	35.8	35.8	35.8
	YES	129	64.2	64.2	100.0
	Total	201	100.0	100.0	

Table 7 is representing that 35.8 % of citizens agreed that they satisfied with affordability of house while 64.2% are not.

Table 8.frequency and percentage of public transport network

SERVICES1					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	91	45.3	45.3	45.3
	YES	110	54.7	54.7	100.0
	Total	201	100.0	100.0	

Table 8 is representing that 45.3 % of citizens agreed that they are satisfied with the public transport network (ratio between accessibility and proximity to amenities or people)while and54.7% are not satisfied with this.

Table 9.frequency and percentage of public transport

SERVICES2					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	77	38.3	38.3	38.3
	YES	124	61.7	61.7	100.0
	Total	201	100.0	100.0	

Table 9 is representing that 38.3 % of citizens agreed that they are satisfied with the public transport while and 61.7% are not satisfied with this.

Table 10.frequency and percentage of average commuting time to the place of work

SERVICES3					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	91	45.3	45.3	45.3
	YES	110	54.7	54.7	100.0
	Total	201	100.0	100.0	

Table 10 is representing that 45.3 % of citizens agreed that they are satisfied with the average commuting time to the place of work while and 54.7% are not satisfied with this.

Table 11.frequency and percentage of education

EDUCATION					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	76	37.8	37.8	37.8
	YES	125	62.2	62.2	100.0
	Total	201	100.0	100.0	

Table 11 is representing that 37.8 % of citizens agreed that there are People from 25 to 64 years old with at least tertiary education while and 62.2% are not satisfied with this fact.

Table 12.frequency and percentage of political participation (voter turnout)

POLITICALPARTICIPATION					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	81	40.3	40.3	40.3
	YES	120	59.7	59.7	100.0
	Total	201	100.0	100.0	

Table 12 is representing that 40.3 % of citizens agreed that there is satisfied voter turnout (voters in the last national election as

a % of the number of persons with voting rights) while and 59.7% are not satisfied with this.

Table 13.frequency and percentage of life expectancy of birth

HEALTH1					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	89	44.3	44.3	44.3
	YES	112	55.7	55.7	100.0
	Total	201	100.0	100.0	

Table 13 is representing that 44.3 % of citizens agreed that they are satisfied with

the life expectancy at birth while and 55.7% are not satisfied with this.

Table 14.frequency and percentage of good health

HEALTH2					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	84	41.8	41.8	41.8
	YES	117	58.2	58.2	100.0
	Total	201	100.0	100.0	

Table 14 is representing that 41.8 % of citizens agreed that they are agreeing that

they are declaring good or very good health while and 58.2% are not satisfied with this.

Table 15.frequency and percentage of environmental quality

ENVIRONMENTALQUALITY					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	78	38.8	38.8	38.8
	YES	123	61.2	61.2	100.0
	Total	201	100.0	100.0	

Table 15 is representing that 38.8 % of citizens agreed that they are satisfied with the environmental quality (Exposure to

PM2.5 in $\mu\text{g}/\text{m}^3$, population weighted (micrograms per cubic metre) while and 61.2% are not satisfied with this.

Table 16.frequency and percentage of personal safety

PERSONALSAFETY					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	91	45.3	45.3	45.3
	YES	110	54.7	54.7	100.0
	Total	201	100.0	100.0	

Table 16 is representing that 45.3 % of citizens agreed that they feel safe working alone at night while and 54.7 % are not satisfied with this.

Table 17.frequency and percentage of transport related mortality rate

COMMUNITY1					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	82	40.8	40.8	40.8
	YES	119	59.2	59.2	100.0
	Total	201	100.0	100.0	

Table 17 is representing that 40.8 % of citizens agreed that transport related mortality rate is satisfied. while and 59.2 % are not satisfied with this.

Table 18.frequency and percentage of people with someone to rely

COMMUNITY2					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	74	36.8	36.8	36.8
	YES	127	63.2	63.2	100.0
	Total	201	100.0	100.0	

Table 18 is representing that 36.8 % of citizens agreed that people with someone to rely in case of need while and 63.2 % are not satisfied with this.

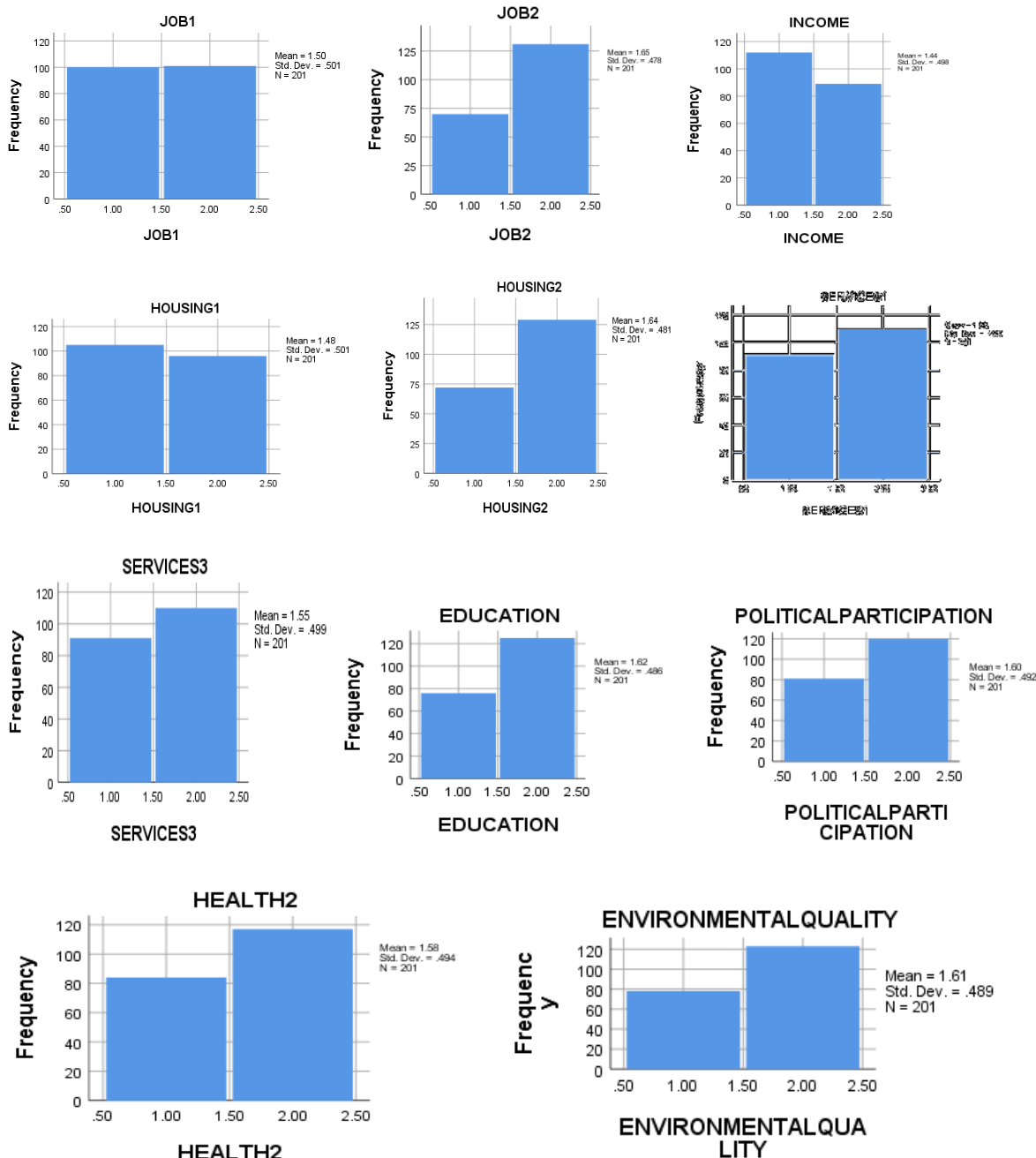
Table 19.frequency and percentage of life satisfaction

LIFESATISFACTION					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	84	41.8	41.8	41.8
	YES	117	58.2	58.2	100.0
	Total	201	100.0	100.0	

Table 19 is representing that 41.8 % of citizens agreed that they are wholly satisfied with their life while and 58.2 % are not satisfied with this.

7.2 Histograms of Indicators

The responses of each indicator of the dimensions are categorised under two heads of 'Yes' and 'No'. The first part of the responses represents Yes, and second part represents No. the histograms are formed with the help of SPSS-25 version



8. 8. Results and Discussion

1. The table 2 is indicating the mean values of various dimensions of “well-being” of Smart City performance indicator. The second indicator of job dimension that is showing that people are satisfied with their job have maximum mean value of 1.65, followed by the second indicator of housing dimension that people are satisfied with the affordability of the house with mean value of 1.64 and lastly from the second indicator of community dimension that people with someone to rely in case of need with mean of 1.63. this results with mean and SD verified

that the citizens of the Raipur city are satisfied with the job, housing, and community dimensions under “well-being” of Smart City performance.

2. Citizen agreed that they are satisfied in job, income, access to services, education, housing, health, community, political participation, environmental quality, personal safety, and life satisfaction.

8.9 Conclusion

It can be concluded that smart Cities can enhance the economic development of the cities and address the problems raised due to

increased urbanisation. The collected data consequential from the survey participants specified that the citizens strongly perceive that they are satisfied with their job, people satisfied with affordability of the houses and people find someone when need. Apart from

that they have positive perception towards all the 11 dimensions of well-being namely job, housing, community, income, access to service, education, political participation, health, environment, and life satisfaction.

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