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**SOCIAL NETWORKING SITES****K N. Prashanth Kumar**Assistant Professor, Department of commerce, IDSG Government College, K. M. Road, Chickkamagaluru-577102, Karnataka

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**ABSTRACT**

*In this era of internet, where almost every activity is getting done through online mode (especially in pandemic situation), social media is also playing an important role in day-to-day life. After 2013-14, In India, smart phones were started getting available in a cheaper rate, different types of Chinese mobile phone companies have started operating in Indian mobile phone market which are relatively same in quality of non-Chinese smart phones, for which smartphone are getting affordable for the people of every income segment, and after 2016 due to Jio effect, internet consumptions have increased drastically and side by side consumption of social networking sites have also increased. In social networking sites or platforms, there are many good things which helps many people and those are also very good for betterment of society, but it has also many negative effects which are impacting very badly to the society and specially teenagers and students. Not only that, virtual crimes are also getting increased day by day, crimes like virtual abuse, death threats, picture morphing has increased drastically. This study is done in secondary data only. This study has observed growth of internet and social media consumption especially after 2016 (as Jio had been launched in 2016) and the usage of social media sites, as well as this study reveals that how social networking sites are helping society in its betterment and also reveals the dark side of it, and try to conclude how those bad impacts can be minimized.*

*Key words: Social media, growth, users, impact, Jio effect, smart phone etc.*

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**INTRODUCTION**

A social networking site may be defined as an online platform on which people interact with other people. In other words, where people build social relationship with outer world. Social networking services vary from each other in terms of their features, contents. Social networking services like Facebook, WhatsApp, Instagram etc. are used to socialize with people having similar career, interests or activities and people also share their thoughts, images, daily activities on that platform. On the other hand, networking site like YouTube gives a person an opportunity to learn different things in free of cost, whereas LinkedIn, an employment oriented social networking service help job seekers to find their jobs. In the year 2013-14, different companies of smartphone have started penetrating their products, for which the users of different social networking sites have increased rapidly. According to the survey done by Statista, there were 142.23 million social media users in the year 2015. Whereas in the year 2020, 376.1 million people are using social networking sites, that means, it has gone up by 164% approx. in recent years. It is also found that most of the social media users are youths and teens, according to the article "social media for youth and civic engagement in India, done by Swetha Kolluri, it is found that 67% social media users are belong between the age group of 15- 29 years, which consist 27% of India's population. Social networking sites have several good aspects like people can connect with their friends and family who lives in different states and countries and can also collect many information and knowledge but it has also many bad impacts like cyber bullying, youths are spending hours and hours in virtual life so they are losing connection with their real life friends and family, due to heavy use of social media sites cybercrime is increasing day by day. Moreover, some people believes that many social media sites collect data of persons who use those particular sites and sell them to other companies, those companies use that data and customize their advertisement according to the preference of that particular user. So it also put a question about the privacy of that particular user.

**OBJECTIVES**

1. To study the growth of internet users and social media users after introduction of 4G.
2. Pros and Cons of Social Media.
3. Impact of social media platforms on young generations.

**RESEARCH METHODOLOGY**

1. Research has been done only through secondary information available on internet. At first, data will be collected about internet as well as social media users before and after the year of 2017 (As, Reliance Jio has been launched in 5<sup>th</sup> September 2016), then comparative study will be made about their growth.
2. Impact of social media will be analyzed through different aspects like earning through social media, information spreading through social media, cybercrime, Death threats, spreading of hatred through social media etc.

**ANALYSIS:**

**Table 1: In the chart given below there is an information of internet users as well as social media users Y-O-Y basis, and growth(%) are taken on approximation basis. Growth(%) has been calculated by taking previous year as base year.**

Particulars	2015	2016	2017	2018	2019	2020
Internet Users (in million)	302	343	422	494	636	697

Growth (%)	-	14	23	17	29	10
Social Media users ( in million)	142	168	296	326	351	376
Growth (%)	-	18	76	10	8	7

Source: <https://www.statista.com>

In the above table we can see that internet users have been increased by 14% in the year 2016, if we take 2015 as a base year, whereas in 2017 it has increased by 23% if we take 2016 as a base year, similarly in 2018 it has been increased by 17% by taking 2017 as a base year, but we can see a drastic increase of 29% in the year of 2019, if we consider 2018 as a base year, and in 2020 it has only increased by 10%, taking the value of 2019 as a base. In the same way we have calculated growth (%) for social media users, and we can see, In the year 2016 Social media users has been increased by 18% which has been drastically increased in the year 2017 by 76% and from the year 2018-2020 it is increased by 10%, 8%, 7% respectively. As, Jio 4g was launched in September 5, 2016, and it was giving free data to all the Jio users in India, from which we can predict that the percentage of social media users increased drastically. Before 2016, data for using internet was very much costly but after Jio effect, cost of internet from the point of view of end user has been decreased which leads to increase in the use of social media. The offer was extended till 31<sup>st</sup> March 2017, after that several monthly packages has been introduced by Jio as well as other companies like Vodafone, Airtel etc. which may be responsible for decreasing in growth rate of social media users. Apart from the above chart, if we analyze the study which has also done by Statista, it can be seen that, famous social media platforms like Facebook, we can see that in 2015, users of Facebook in India was 136 million (approx.) which is increased to 166 million (i.e. 22%) in the year 2016, but in the year of 2017, Facebook users were 248 million (approx.), that means it has been increased by 49%, in case of WhatsApp users in India, It was 70 million in November 2014 which has been reached to 160 million in November 2016 which shows a sharp increase of 128%. YouTube is also very famous social media platform which is being used mostly for education and entertainment purpose, in the year 2017, total YouTube users were 169 million whereas, in the year 2019, it has touched 272 million users (Approx.) that means it has been increased by 61%.

**Table 2: In this chart most popular social media platforms in the world are shown**

Social Media platforms	Active usage (in percentage)
Facebook	63%
YouTube	61%
WhatsApp	48%
Facebook messenger	38%
Instagram	36%

Source: <https://www.statista.com>

In the above chart, we can see that Facebook is in the dominating position in terms of social media and get on an average 63% active usage followed by YouTube, WhatsApp, Facebook messenger, Instagram with 61%, 48%, 38%, 36% active usage respectively.

### **POSITIVE IMPACT OF SOCIAL MEDIA**

In the above analysis we have seen the rapid growth of social media platforms especially after the year of 2016 (Due to cheaper cost of internet), now if we analyze the impacts of social media, we can find that there are several good impacts of it, if we consider Facebook, it gives an opportunity to get updated about the world by providing several latest information and news. It also gives entertainment to its users by providing several video clips, songs etc. It also helps its users to find friends and family members stays far away from home. It also gives an opportunity to its users' to share thoughts by posting them in their Facebook wall. Many talent has got its recognition due to this platform, persons like Ranu Mandal, Yuvraj Singh (popularly known as Baba Jackson) have got recognition for their talent through this platform.

In case of WhatsApp, it is much faster, easier medium of communication. It is secure too because the message sent from one user to another is end-to-end encrypted, that means no one can read the message in the middle of the message delivery process, not only that, in this pandemic situation where offline classes are not allowed in school/ colleges, WhatsApp is being used as a medium of providing education. A study which has done by Vidyasaarathi, reveals that 59% students in India prefers WhatsApp for their online learning, though 75% students want physical class rather than online class, Poor internet connection, difficulty in focusing, difficulty in doubt clearing are the main reason for that, but still WhatsApp has played a very important role in continuing education system even in this corona situation.

If we consider YouTube, it is a great source of knowledge and information. There are many channels in the YouTube who provides and discusses several topics and students can learn from those for free. Channels like Ted Ed (provides classes on mathematics, health studies etc.), Khan Academy (Provides classes on math, science, economics etc.), Study in education (Provides classes on related topics for UPSC, SSC, CGL) etc., over a million viewers consume contents from these channels every day. Not only that, it is also a great source for entertainment, Indian YouTube content creator like Ajey Nagar (Channel name Carryminati), Bhuvan Bam (Channel name BB ki Vines), AsishChanchlani (Channel name Ashish Chanchlani Vines) etc. are some famous YouTubers who make video for entertainment. Though sometimes they use slangs to make their videos more interesting, funny or unique which may put bad impacts on students. YouTube is also gives an opportunity to earn money by creating content in this platform, a person who wants to be a content creator has to make a YouTube channel and put content videos on it, it needs 1000 subscribers and 4000 hours

watch time in a year to get a channel monetized in this platform. If we talk about how a YouTuber makes money, Google pays \$68 of their revenue to the publisher which they earn from AdSense, for every \$100 an advertiser pays, that means Google gives 68% of their revenue. On an average an advertiser pays \$18 for every 1000 ad views from this it can be estimated that a YouTube channel may earn \$3-\$5 from every 1000 views of their video. So if a YouTube channel gets 20000 views in a video daily, it can be estimated that channel can earn \$36.75-\$61.25 daily. If we consider 600000 views in a video per month, estimated monthly earning can be \$1103-\$1837, though it's all depend upon the contents of that channel and that content creator.

### **BAD IMPACT OF SOCIAL MEDIA:**

Earlier, we have discussed, the good side of the social media but there are many things which affects negatively to the society, though most of this negative impacts are occurring due to excessive use of social media.

**Health problem:** Excessive use of social media is affecting mental health very badly. Most of the people use social media when they feel boar, lonely, depressed and using social media excessively increase the feeling of inadequacy, dissatisfaction which in turn increases depression, anxiety and this goes in a circular way. Apart from the mental health, it affects badly to the physical health also, excessive use of social media leads to eye strain, poor posture etc.

**Cyber bullying:** About 33% of the people who are using social media face cyberbullying. It is one way of harassing people by spreading lies, posting embarrassing photos, sending hurtful

messages on social media, because of this cyber bullying many teenagers goes through depression, many of them attempts suicide and lost their life due to this. In a recent report prepared by Rhea Maheswari, it is shown that 1 out of 4 teenagers has seen their morphed photos and 50% of them have not lodged any complain to the police. Not only that, on an average 25% of the people in social media been faced offensive comments, death threats etc.

**Lack of sleep:** Due to excessive use of internet and social media, people (mostly teenagers) suffer through lack of sleep, which eventually affects their health.

**Focus:** Heavy use of social media, Students are getting less focused in their studies which is eventually affecting their career.

**Detachment from friends and family:** In recent days, Social media has become a substitute for real life friends and family. Due to this people are getting uninterested to hang out with offline friends, offline social interaction getting worsen day by day. Most of the teenagers like to play online or with social media friends virtually rather than offline games.

### CONCLUSION:

In the above discussion growth, good and bad impacts of social media have been analyzed, there are a lot of good things of social media which are really helpful for the betterment of the society, but also there are many things which affects badly, mostly to the teenagers and students, which should be minimized. It may be done through the following way.

Those who are using social media (mostly students and teenagers) should know how to use it, that means there should be a proper guidance by which they can understand and learn what to, what to ignore and how to react on certain things, which can reduce problems like cyber bullying, death threats, virtual abuse to some extent.

Teenagers on an average spent at least 3 hours in a day, whereas adults spent less time of it. On an average internet users spent 2.5 hours a day in social media, for which students are getting less focused on their studies or career, so reducing the time spent on social media is necessary, study reveals that if a social media user can reduce their time spent to 30 minutes in a day, this problem can be minimized.

There are many fake messages which are circulated through social media (Mostly through WhatsApp), so every information which are getting from social media can be rechecked by trusted websites through google, by this spreading of fake messages through social media can be minimized.

At the time of sleeping, phone or by which a person use social media, should not be taken into bed.

More and more time should be spent with offline friends and family, rather than virtual friends and should do things by which a person can get positive energy which may reduce boredom, loneliness and improve self- confidence.

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**TRADE COOPERATION AND REVEALED COMPARATIVE ADVANTAGE OF PAKISTAN AND CHINA IN WORLD MARKET OF MERCHANDISE GOODS**

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**Suadat Hussain Wani\*, Shahid Hamid Raina\*\* and M. Afzal Mir\*\*\***

\* Ph.D., Scholar. Centre of Centre Asian studies, University of Kashmir Hazartbal Srinagar, 190006

\*\*Assistant Professor, Department of Economics, Central University of Kashmir

\*\*\*Associate Professor, Centre of Centre Asian Studies, University of Kashmir Hazartbal Srinagar, 190006

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**ABSTRACT**

*This study examined the revealed comparative advantage (RCA) of Pakistan and China in 99 product groups at HS 2digit classification in world market. The results indicate that Pakistan enjoy comparative advantage in those sectors which require large number of labour force, and focusing on these would help the country to move on the path of sustainable development. Further the two economies are competitive in nature and are competing with each other in world market. Thus given the availability of resources and technology, it would be beneficial for both countries to develop joint ventures in those industries in which both enjoy comparative advantage. The development of joint ventures would help both countries to further enhance bilateral economic and trade cooperation in long run.*

*Keywords: Revealed Comparative Advantage, Trade Cooperation, Bilateral Trade*

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**INTRODUCTION**

Relative price and non-price factors are considered to determine export structure of a particular country. Various economists have explained export structure of countries based on their comparative advantage. The comparative advantage theory was first propounded by David Ricardo (1817), who was of the view that trade between countries maximizes welfare and free trade would lead to increase in economic prosperity of the world. Ricardo explained his theory based on differences in costs and technology between countries. Follow up of highlighting the absurdity of basing the original comparative advantage on "Labour Theory of Value". Haberler in 1936 views opportunity cost of producing a particular good as base for comparative advantage. In a significant development, Heckscher (1919) and Ohlin (1952) redefined the concept and explained comparative advantage on the bases of factor endowment in a country. The redefined concept popularly known as Heckscher-Ohlin theory urge that a country should specialize in those products in which its abundant factor is used. Thus labour-intensive countries should produce and export labour-intensive products and vice-versa. The neo-factor-proportion theory explained factor efficiency as base of comparative advantage. In contrast, product cycle and technology gap model argued that soft technological change like learning by doing and technological innovation is the base of comparative advantage (Salvatore, 2013; Beyene 2014; Abbas & Waheed 2017). Most recent studies are of the view that change in government policy can bring change in comparative advantage of nations.

Kowalski (2011) is of the view that reliance on the concept of RCA has increased owing to its significant influence it has for policy issues in international trade. The supporters of free trade argue that countries should focus on the products in which they enjoy comparative advantage.

The present study investigates revealed comparative advantage which Pakistan and China enjoy in world market based on the concepts provided by the theories discussed above. The study provides evidence for the comparative advantage that each country enjoys in third market and the commodities in which they have gained or lost comparative advantage during the period 2003-18.

The first attempt to measure comparative advantage was by Liesner in 1958 to find the effect of intra-European free trade on particular British industries by using export data of goods which have performed well in recent years in export market. However, it was Balassa who introduced RCA index in 1965 by using data of major industrial countries on exports and export-import ratios. Balassa himself further improved the index in 1977 by using data of relative export performance as tariffs and other trade barriers affect the export-import ratio. Many scholars like (Balassa, 1979; Hinloopen & Marrewijk, 2001; Mahmood, 2004; Batra & Khan, 2005; Riaz, Hans, & Malik, 2010; Tahir & Shah et al., 2012; Ahmad & Rukhsana, 2013; Shahab & Mahmood, 2013; Rizwan-Ul-Hassan, 2013; Yasmin & Altaf, 2014; Tochkov, Liu, & Nath, 2015) have used this index to find the comparative advantage of products, sectors and industries of different countries with respect to other countries, regions and world market. The RCA measures individual relative trade performance of individual countries in particular sectors and commodities with respect to other countries.

To examine comparative advantage of Pakistan and China, the study adopts four steps. First the RCA index of both countries are calculated at HS2 digit classification for 99 product groups. The computed values indicate whether a particular country has comparative advantage in a particular product group or not. Second the trend of RCA in each product group are highlighted. Third those product groups in which Pakistan and China has gained or lost comparative advantage in the study period are pinpointed. The study is first attempt to the best of researcher’s knowledge to investigate comparative advantage of Pakistan and China in third market which would highlight the complementary or competitive nature of two economies.

**LITERATURE REVIEW**

Riaz, Jansen and Malik (2010) have examined comparative advantage of Pakistan in agricultural sector by using Balassa index (1965). The authors conclude that Pakistan enjoys revealed comparative advantage (RCA) only in cereals, especially in rice and horticultural products at the world level. However, the picture is different at the regional and country-level where Pakistani meat to the Gulf States, dairy products to South Asian countries, cheese to the US and Europe enjoy comparative advantage. To improve its performance, the country needs to establish cold-storage chains and upgrade its abattoirs. According to Hassan (2013), Pakistan enjoys comparative advantage in rice in Asian market. The other products include fish and fish preparation, meat and meat preparation, vegetables and fruits in which Pakistan enjoys high potential of export growth with respect to global market. Using Balassa index (1965), Shahab and Mahmood (2013) examined comparative advantage of Pakistan in the leather industry with respect to China, India and Iran for 2002-09. The study found that Pakistan enjoys increasing comparative advantage compared to other countries in the leather industry but needs to take some bold steps to overcome its problems. In another study, Yasmin and Altaf (2014) analyzed comparative advantage of Pakistan using Balassa index (1965) for the period 1996-2009 in carpet and textile floor covering industry and compared it with comparative advantage enjoyed by India and China. The results indicate that Pakistan, India and China enjoy comparative advantage in this sector with China reporting declining trend towards end of the study period. On the other hand, RCA value enjoyed by India was more significant than China and Pakistan. This indicates that the main reason for dominance of India in the carpet industry is its unique and exclusive design. On the other hand, RCA value of Pakistan indicates that this sector has high potential for growth given that resources are appropriately utilized, and the government supports this sector through training programs and new schemes.

Irshad and Xin (2015) have used comparative advantage and trade intensity index to find in which goods China and Pakistan have advantage to trade with each other and other countries of the world. Exports from China seem to be more diversified and competitive than exports from Pakistan. China has comparative advantage in producing capital-intensive goods, whereas Pakistan can produce and export textile and semi-manufactured goods. Thus the author concludes that there is need for a comprehensive study to find ways by which two countries can increase cooperation and engage in service trade, cross border investment and enhance research and development efforts. Applying RCA index, Abbas and Waheed (2017) conclude that Pakistan enjoys comparative advantage in many agricultural and manufacturing products, including raw cotton, fruits, textiles, and sports goods, among other such products. The study suggests that the country needs to focus on labour-intensive industries and solve problem of these industries to compete in the world market and attract domestic and foreign investment in these industries.

From the available literature discussed above, it can be concluded that only few sectors of Pakistan and have been examined and not much attention has been paid to understand complementary or competitive nature of two economies in world market. The present study tries to fill the research gap by making an attempt in this direction.

**METHODOLOGY**

The Balassa index (1965) has been used in the present Study, which is defined as Country's share of world exports of commodity k divided by its share of total world exports. The index of Country I for commodity K is calculated as follows:

$$RCA_{IK} = \frac{\frac{X_{IK}}{X_I}}{\frac{X_{WK}}{X_W}} \dots \dots \dots (1)$$

Where:

$RCA_{IK}$  = Revealed Comparative Advantage of Country i in commodity k.

$X_{IK}$  =  $i^{th}$  Country's export of commodity k.

$X_{WK}$  = World exports of commodity k.

$X_I$  = Total exports of Country I.

$X_W$  = Total World exports.

The index has simple interpretation. It takes the value between 0 to  $\infty$ . If the index takes the value of more than unity for a particular commodity, it means the Country enjoys comparative advantage in that commodity. If the value is less than unity, it shows that Country does not enjoy any advantage in the export of that commodity. The Country should devote resources to those commodities with RCA value more than unity to earn foreign exchange and use its available resources efficiently. The Country should import those commodities that have RCA value of less than unity as they can be imported at lower price than domestically produced goods. However, the value obtained from Balassa index is asymmetric, i.e. zero bound for sectors which face comparative disadvantage, but is unbounded for sectors which enjoy a comparative advantage. The solution to this problem is normalized RCA, proposed by Laursen (2000). In the present Study, after using the Balassa index, normalized RCA is used to overcome the above highlighted problem of RCA. The normalized RCA index is as:

$$NRCA_{IK} = \frac{(RCA_{IK} - 1)}{(RCA_{IK} + 1)} \dots \dots \dots (2)$$

The interpretation is similar to standard RCA, except the critical value which is now 0 instead of 1, and lower and upper bounds are symmetrical at -1 to +1 respectively. The results presented in the analysis are in NRCA instead of standard RCA. Any value with a positive sign shows commodities with comparative advantage and values with negative sign shows comparative disadvantage with respect to the partner country.

Though many scholars have successfully used the index to find comparative advantage of different countries in their international trade, the index gets affected by many economic factors. With the help of RCA, we cannot find which commodities have gained comparative advantage due to favourable policy and which commodities have inherited comparative advantage in the economy. Moreover, RCA cannot differentiate between change in trade policy and innovation of new factors of production and an increase in factor endowment. In bilateral trade, comparative advantage gets affected by the imposition of tariffs, quotas and other trade barriers. These barriers raise the price of imported commodities, thus adversely affecting their comparative advantage. Thus in any analysis, distortion in RCA due to policy change should be recognized.

**RESULTS AND DISCUSSION**

**China: Sector-Wise Analysis with World**

The NRCA index was greater than 0 for 47 sectors for China in 2003, indicating that the Country enjoys comparative advantage in those sectors with respect to world at HS-2digit classification. However, in 2018 the number of sectors declined to 44 sectors in which the Country was enjoying comparative advantage. During this period, China gained comparative advantage in six sectors, where at the same time, ten sectors lost their comparative advantage with respect to world, reflecting necessary structural adjustment in the economy.

In 2003, China enjoyed comparative advantage in 47 sectors at HS-2digit classification with respect to world, which changes to 44 sectors in 2018. As per results, the sectors of China indicating consistency in comparative advantage over the entire analysis period (2003-2018) include “manufactures of straw, of esparto/of other plaiting materials; basketware and wickerwork (46), umbrellas, sun umbrellas; and walking sticks, seat-sticks, whips, riding-crops and parts thereof (66), prepared feathers down, articles made of feathers/of down; artificial flowers; articles (67), silk 50), articles of leather; saddlery and harness; travel goods; hand bags and similar containers; articles (42), headgear and parts thereof (65), toys, games and sports requisites; parts & accessories thereof (95), other made-up textiles articles; sets; worn clothing: worn textile articles; rags (63), footwear, gaiters and the like; parts of such articles (64), railway or tramway locomotives, rolling stock & parts thereof; railway and tramway track fixtures (86), furskins and artificial fur; manufactures thereof (43),” etc. as presented in Table 1. It should be noted here that only few sectors have been reported in Table 1 and other sectors in which country enjoys comparative advantage during this period are presented in Table A1.

Table 1: China's RCA Index with World (HS-2 Digit, 2003-2018)

Product Code	Product Label	2003	2008	2013	2018
46	Manufactures of straw, esparto or other plaiting materials: basketware and wickerwork	0.81	0.78	0.71	0.66
66	Umbrellas, sun umbrellas, walking sticks, seat-sticks, whips, riding-crops and parts thereof	0.79	0.75	0.74	0.70
67	Prepared feathers and down, articles made of feathers or down; artificial flowers; articles	0.75	0.72	0.72	0.70
50	Silk	0.72	0.63	0.63	0.60
42	Articles of leather; saddlery, harness; travel goods, handbags, similar containers; articles	0.71	0.58	0.55	0.46
65	Headgear and parts thereof	0.64	0.63	0.63	0.56
95	Toys, games, sports requisites: parts and accessories thereof	0.63	0.57	0.55	0.57
63	Other made-up textile articles; sets; worn clothing and worn textile articles; rags	0.61	0.61	0.57	0.52
64	Footwear, gaiters and like: parts of such articles	0.60	0.56	0.54	0.42
86	Railway-tramway locomotives; rolling stock and parts thereof; railway-tramway track fixtures	0.60	0.49	0.40	0.43

Data Source: International Trade Centre, Computed

During the same period (2003-18), China lost comparative advantage in 9 sectors as given in table 2 which were mainly related to the agriculture and natural resource-based sectors. China lost comparative advantage in sectors which include "lead and articles thereof (78), tin and articles thereof (80), zinc and articles thereof (79), clocks and watches and parts thereof (91), fish and crustaceans, molluscs and other aquatic invertebrates (03), cereals (10)" with respect to the World at HS-02 classification. During the same period, the Country gained the comparative advantage in 6 sectors which are organic chemicals (29), wadding, felt and nonwovens; special yarns; twine, cordage, ropes and Tables and articles thereof (56), aluminium and articles thereof (76), ships, boats and floating structures (89)" with respect to the world.

Table 2: China's RCA Index (Gain and Loss) with World (HS-2 Digit, 2003-2018)

Product Code	Product Label	2003	2008	2013	2018
13	"Lac; gums, resins and other vegetable saps and extracts"	-0.36	-0.01	0.02	0.18
29	"Organic chemicals"	-0.23	-0.05	-0.10	0.02
56	"Wadding, felt and nonwovens; special yarns; twine, cordage, ropes and cables and articles thereof"	-0.19	0.03	0.19	0.23
59	"Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable"	-0.00	0.33	0.42	0.39
76	"Aluminium and articles thereof"	-0.13	-0.01	0.02	0.04
89	"Ships, boats and floating structures"	-0.03	0.19	0.25	0.20
78	"Lead and articles thereof"	0.41	-0.36	-0.68	-0.78
80	"Tin and articles thereof"	0.30	-0.44	-0.70	-0.81
79	"Zinc and articles thereof"	0.21	-0.49	-0.73	-0.82
91	"Clocks and watches and parts thereof"	0.21	-0.08	-0.07	-0.18
14	"Vegetable plaiting materials; vegetable products not elsewhere specified or included"	0.20	0.03	-0.05	-0.01
20	"Preparations of vegetables, fruit, nuts or other parts of plants"	0.17	0.12	0.04	-0.02
03	"Fish and crustaceans, molluscs and other aquatic invertebrates"	0.08	-0.11	0.01	-0.09
25	"Salt; sulphur; earths and stone; plastering materials, lime and cement"	0.07	-0.06	-0.22	-0.24
10	"Cereals"	0.05	-0.86	-0.93	-0.87

Data Source: International Trade Centre, Computed

During the specified period, China faces comparative disadvantage with respect to the world in sectors including “diary produce; bird’s eggs; natural and honey; edible products of animal origin, not elsewhere (04), coffee, tea, mate and spices (09), ores, slag and ash (26), mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral (27), pharmaceutical products (30), fertilizers (31) essential oils and residuals; perfumery, cosmetic or toilet preparations (33)” etc. as presented in Table A2.

**Pakistan: Sector-Wise Analysis with world**

For Pakistan, normalized RCA value was greater than 0 for 26 sectors in 2003, which increased to 27 sectors in 2018 at HS-2digit classification with respect to the world during the analysis period. Like China, Pakistan also gained as well as lost comparative advantage in many sectors during this period, reflecting necessary structural adjustment in the economy. According to the results presented in Table 2, Pakistan enjoys comparative advantage in sectors which include “Other made-up textile articles; sets; worn clothing and worn textile articles; rags (63), cotton(52)” in Study period (2003-18) followed by “carpets and other textile floor coverings (57), cereals(10), articles of leather; saddlery and harness; travel goods; hand bags and similar containers; articles (42), articles of apparel; clothing accessories, knitted or crocheted (61), explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations (36), raw hides and skin (other than furskins) and leather (41)”, etc. with respect to world. Table 3 shows only few sectors and full list of product groups in which Country enjoys comparative advantage during this period are presented in Table A2.

**Table 3: Pakistan’s RCA Index with World. (HS-2 Digit, 2003-2018)**

Product Code	Product Label	2003	2008	2013	2018
63	Other made-up textile articles; sets; worn clothing and worn textile articles; rags	0.96	0.96	0.95	0.96
52	Cotton	0.94	0.96	0.96	0.95
57	Carpets and other textile floor coverings	0.87	0.81	0.71	0.55
10	Cereals	0.82	0.89	0.85	0.88
42	Articles of leather, saddlery/harness: travel goods, handbags, similar containers; articles”	0.82	0.84	0.76	0.73
61	Articles of apparel and clothing accessories, knitted or crocheted	0.77	0.78	0.74	0.81
36	Explosives and pyrotechnic products, matches, pyrophoric alloys, certain combustible preparations	0.75	0.71	0.61	0.21
13	Lac, gums, resins, other vegetable saps, extracts	0.72	0.72	0.81	0.62
41	Raw hides, skins (other than furskins) and leather	0.71	0.82	0.83	0.81
62	Articles of apparel and clothing accessories, not knitted or crocheted	0.68	0.71	0.74	0.79

**Data Source: International Trade Centre, Geneva, Computed**

During the same period, Pakistan lost comparative advantage with respect to the world in sectors like “Man-made filaments; strip and the like of man-made textile materials (54), miscellaneous manufactured articles (96), knitted or crocheted fabrics (60), Arms and ammunition; parts and accessories thereof (93) and footwear, gaiters and like; parts of such articles (64)” whereas in sectors including “salt; sulphur; earth and stone; plastering materials, lime and cement (25), coffee, tea, mate and spices (09), beverages, spirits and vinegar (22), meat and edible meat offal (02), copper and articles thereof (74)” gained comparative advantage as shown in Table 4.

**Table 4: Pakistan’s RCA Index (Gain and Loss) with World (HS-2 digit, 2003-18)**

P Code	Product Label	2003	2008	2013	2018
25	"Salt; sulphur; earths and stone; plastering materials, lime and cement"	-0.04	0.81	0.84	0.77
09	"Coffee, tea, maté and spices"	-0.06	-0.14	0.12	0.27
82	“Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal”	-0.11	-0.05	0.03	0.11
22	"Beverages, spirits and vinegar"	-0.51	0.32	0.41	0.49
02	"Meat and edible meat offal"	-0.69	-0.34	0.12	0.18

74	"Copper and articles thereof"	-0.73	-0.56	-0.11	0.27
54	"Man-made filaments; strip and the like of man-made textile materials"	0.84	-0.21	-0.37	-0.35
96	"Miscellaneous manufactured articles"	0.31	0.04	-0.31	-0.53
60	"Knitted or crocheted fabrics"	0.31	0.36	-0.14	-0.26
93	"Arms and ammunition; parts and accessories thereof"	0.27	-0.22	-0.72	-0.61
64	"Footwear, gaiters and the like; parts of such articles"	0.02	0.06	-0.22	-0.21

**Data Source: International Trade Centre, Geneva, Computed**

On the other hand, Pakistan faces disadvantage in 73 sectors which include "live animals (01), cocoa and cocoa preparations (18), preparation of cereals, flour, starch or milk; pastry cook's products (19), miscellaneous edible preparations (21), tobacco and manufactured tobacco substitutes (24), ores, slag and ash (26), organic chemicals (29), fertilizers (31), tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring (32), essential oils and residuals; perfumery, cosmetic or toilet preparations (33), soap, organic surface-active agents, washing preparations, lubricating preparations, artificial (34), albuminoidal substances; modified starches; glues; enzymes (35)" etc. with respect to the world (Table A3).

By definition, every Country enjoys comparative advantage in some products depending on available resources and technology. Pakistan and China need to focus on sectors in which they enjoy comparative advantage. Pakistan enjoys comparative advantage in those sectors which require a large number of the labour force, focusing on these sectors would help the Country to create employment opportunities. Looking at the comparative advantage which Pakistan enjoys during this period and comparing it with China, it can be concluded that these economies are competitive enough in the world market of merchandised goods. Again looking at the comparative disadvantage in (Table A4.4 and A4.5) which the two countries face with respect to world in the analysis period, it can be said that two countries are competitive, not complementary to each other.

### CONCLUSION

From last two decades, Pakistan and China has shifted their focus to improve bilateral economic and trade cooperation. It is in this context that the present study attempted to examine nature of competition two countries face with respect to each other in world market. The results show that there are 15 product groups in which both countries enjoy comparative advantage with respect to world. This also indicates that there are only 11 sectors in which Pakistan doesn't face any direct competition from China. Given the level of technology and resources, it would be difficult for Pakistan to compete with China globally. However, it is important to mention here that two countries are establishing industrial clusters under China-Pakistan Economic Corridor signed in 2015. Thus to enhance their economic and trade cooperation, it is important for two countries to establish joint ventures in those product groups in which they compete with each other in world market. Besides in those sectors where Pakistan doesn't face any competition from China in world market need to be provided necessary facilities to enhance their competitiveness and volume in world market. Thus govt of Pakistan need to pay special attention to export sector to not only improve its performance but also to put the economy on the path of sustainable development in the long run. On the other hand, China needs to provide more favourable terms to Pakistan to enhance export as well as economic performance of the country which would further strengthen their cooperation in the long-run.

### Note:

The additional tables are available with the author and can be requested when required.

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**TO ASSESS THE PSYCHOLOGICAL IMPACT (STRESS AND ANXIETY) OF SOCIAL MEDIA ON QUARANTINE PEOPLE RELATED TO COVID 19**

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**Ms. Rucha Bante<sup>1</sup>, Mr. Shiva Bawane<sup>2</sup>, Mr. Pranay Bende<sup>3</sup>, Mr. Nikhil Bhagat<sup>4</sup>, Mr. Suhas Talwekar<sup>5</sup> and Ms. Manjusha Mahakarkar<sup>6</sup>**

B.Sc. Nursing Final Year<sup>1,2,3,4,5</sup>, HOD Obstetrics and Gynecology Nursing<sup>6</sup>

Smt. Radhikabai Meghe Memorial College of Nursing, Datta Meghe Instituted of Medical Sciences (Deemed to be University), Sawangi (Meghe), Wardha, Maharashtra, India

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**ABSTRACT**

*Need of study: The quarantine would impact on day-to-day employees and companies with daily profits. Confining abnormally reduced social and physical contact with others whereas loss of habits is direct links to distress, monotony, social isolation and disappointment. Hence the investigator plan to assess effect of social media on mental health of quarantine people related to covid-19. Objectives: 1. To assess the psychological impact (stress and anxiety level) on quarantine people. Methodology: The study was based on evaluative approach. The population was about all adult, above 18 – 60 years of age who were quarantined. Sampling technique used in the study was probability convenient sampling and the tool was PSS scale and GAD-7 checklist. The data gathering process began based on the objectives and the hypothesis the data was statistically analyzed with various tests such as descriptive statistics and inferential statistics. Result: Majority 60% of the subjects had moderate level stress regarding social media on quarantine people due to covid-19 and 91% of subjects had mild anxious regarding social media. Conclusion: Research study concludes that clients of community were suffered from stress and anxiety during covid pandemic as per their occupation and lack of knowledge regarding stress and anxiety management brought result in increasing disturbance in performing daily activity with increasing in death rate due to over use of social media.*

*Key word: Psychological impact, Stress, Anxiety, Social media, Quarantine people*

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**INTRODUCTION**

Corona viral disease 2019 (COVID-19) is a new virus in a family of viruses alongside existing viruses, such as (SARS-CoV). These viruses are responsible for infections ranging from cold to more serious diseases such as pneumonia, SARS, insufficient renal problems and sometimes mortality (3%–5%).<sup>1</sup>

The 2019 Corona Virus Disease (COVID-19) has had a worldwide psychosocial impact due of public hysteria, economic burden, and financial losses, in addition to its high infectivity and death rates. The widespread fear of COVID-19, dubbed "corona mental illness," resulted in a slew of mental manifestations in people from all walks of life. As a result, this study was conducted to determine COVID-19's psychosocial impact.<sup>2</sup>

At first the COVID-19 epidemic led to and increased worry & panic among individuals as all were cleared of fears of infection. While in cases of disease breakout a high anxiety reaction which may normally be expected, many people who suffer from previous angst, associated disorders, and worsening symptoms have encountered.

Confinement, abnormally limited physical interaction with others, and loss of habits are all linked to stress, restlessness, social isolation, and frustration.<sup>3</sup>

Hence the investigator planned to assess the mental effects of social media on quarantine people of rural area due to COVID 19 in Wardha city is very essential to know about the psychological status of people and give intervention on that to prevent that impact. This is a need for a study to conduct on this topic.

**METHODOLOGY**

This thesis used an evaluative testing methodology with a non-experimental descriptive research design on 100 quarantined people above 18 years in Sarud and Mamdapur, Taluka-Deoli, District-Wardha were selected by using a probability sampling technique. This study included those who are quarantine due to COVID 19 and present at the time of the study. The demographic Performa and a standardized checklist on assessing the level of stress and anxiety with a formal teaching program in this research.

The investigator obtained permission from the concerned authorities of Smt. Radhikabai Memorial College of Nursing and the Sarpanch of the village Sarud and Mamdapur respectively. Informed consent is taken from the participants. The subject is requested to complete the tool after assuring confidentiality of the information. Consent is obtained from the subject. Explained what is the need and purpose behind conducting the research. The participant's actively participated data got collected and finally the investigator thanked all of the research samples as well as the authorities for their assistance after the data collection process was completed.

**RESULTS:**

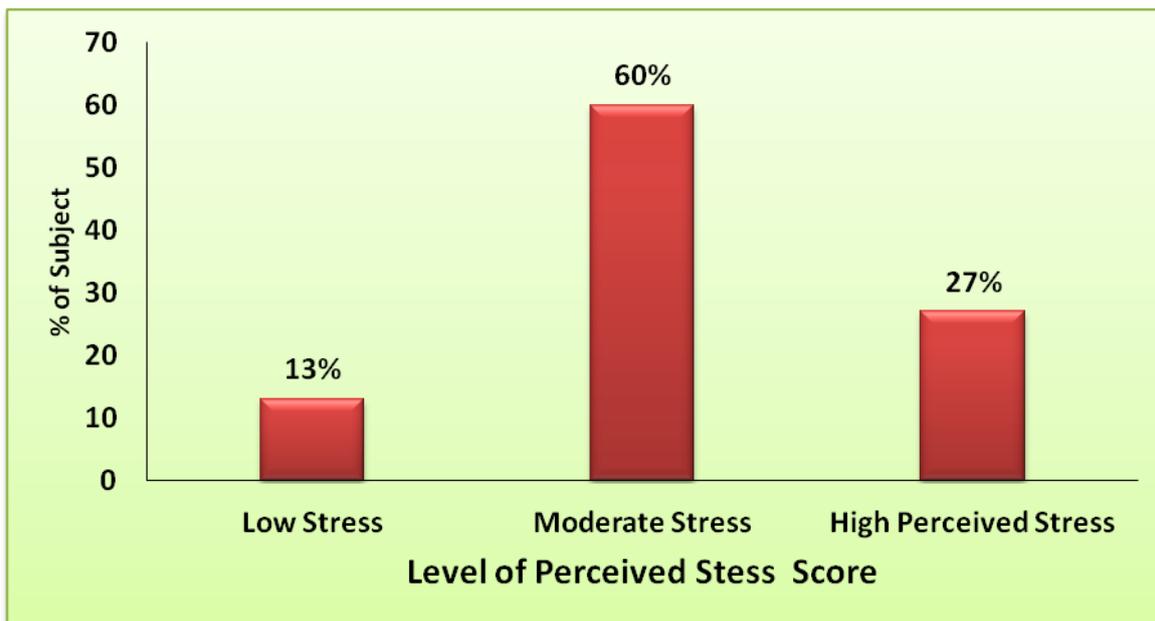
The findings are organized and presented in two parts as shown below:

**Table 1: Distribution of subjects in relation to perceived stress scale regarding psychological impact (stress and anxiety) of social media on quarantine people due to covid-19. (n=100)**

Level of Stress score	Score Range	Percentage score	Level of Stress score	
			Frequency (f)	Percentage (%)
Low Stress	01 – 13	0 – 33%	13	13
Moderate Stress	14 – 26	34 – 67%	60	60
High Perceived Stress	27 – 40	68 – 100%	27	27
Mean ± SD stress score			21.36 +7.175	
Mean % stress score			53.40%	
Minimum score			06	
Maximum score			34	

Majority 60% of subjects had moderate level stress in relation to social media on quarantine people because of covid-19, 27% had high stress of social media causes a lot tension in people's minds on quarantine people due to covid-19 and 13% had low level stress regarding social media on quarantine people related to covid-19.

- Mean stress score of the subjects was 21.36 + 7.175
- Minimum stress score was 06 and
- Maximum stress score was 34.

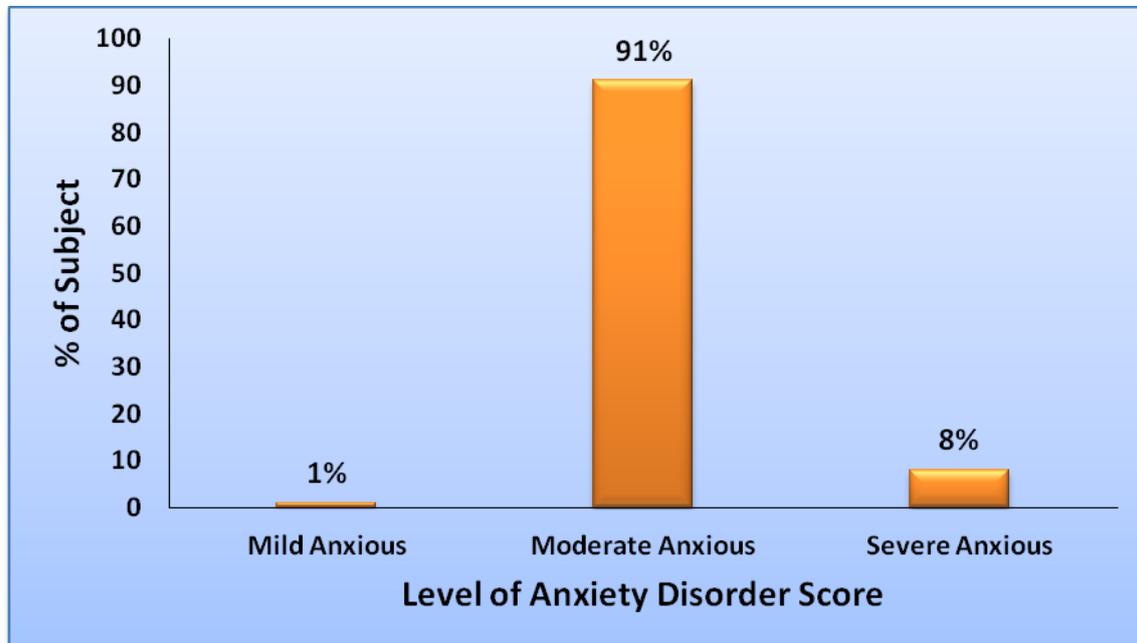


**Table 2: Distribution of subjects in relation to anxiety disorder regarding psychological impact (stress and Anxiety) of social media on quarantine people related to covid-19. (n=100)**

Level of anxiety score	Score Range	Percentage score	Level of anxiety score	
			Frequency(f)	Percentage (%)
Mild Anxious	01 – 07	0 – 33%	01	01
Moderate Anxious	08 – 14	34 – 67%	91	91
Severe Anxious	15 – 21	68 – 100%	08	08
Mean±SD anxiety score			11.84 + 2.116	
Mean % anxiety score			56.38%	
Minimum score			07	
Maximum score			18	

Majority 91% of subjects had mild anxious, 8% had severe anxious and 1% had mild anxious regarding social media on people who were being isolated owing of covid-19.

- Mean anxiety score of the subjects was  $11.84 \pm 2.116$
- Minimum anxiety score was 07 and
- Maximum anxiety score was 18.



## DISCUSSION

The results of this study were addressed with regard to goals, theoretical basis and the proposed hypothesis.

The present study findings stated that the majority 60% of quarantine people due to COVID-19 had moderate level of stress regarding social media whereas 91% of subjects had mild anxious regarding social media.

Similarly a researcher conducted study on covid-19 isolation where people struggled with feelings of stress and anxiety. Over use of social media by Italian adults and the findings were the goal of this study was to see if people who were forced to isolate because to the covid-19 pandemics more common likely to be nervous, and if their loneliness led to over social media use. Furthermore, the impact of constantly severe social media use on the relationship between alone and anxiety was studied. During the Italian lockdown, an online survey of 715 respondents (71.5 percent women) aged 18 to 72 years old was conducted. Self-information measures to evaluate felt feelings of isolation, overuse of social media and fear were included in the study.<sup>4</sup>

“Similarly a study was conducted for analysis of mental health and wellbeing impacts during covid-19, is there any impact? A cross-sectional MENA area study and the result showed impact of event scale revised (IES-R) which was used to assess the psychological effect, while questions from the perceived stress scale were used to assess social and familial support. The mean IES-R score was 29.3 (SD = 14.8), indicating a mildly stressful impact, with 30.9 percent having a significant psychological impact. Because of this, the majority of participants (45 percent–62 percent) felt terrified, worried, or powerless. COVID-19 is a virus that infects people. Furthermore, over 40% of respondents said employment and financial concerns had worsened their stress levels. Females, 26-35 year olds, people with a lower level of education and those in North Africa all had higher IES-R scores ( $p < 0.005$ ). About 42% said they were getting more assistance 40,5% said they paid more attention to their mental health and more of their family members 80% said they were paying more care to their physical health.<sup>5</sup>”

## CONCLUSION:

After the detailed analysis, this study leads to the following conclusion that:

The distribution of population according to the age, gender, family status, health status, education, occupation and using what type of social media to stay entertained or daily news updated during quarantined for this study, concluded that 27% were suffering from stress respectively 8% from anxiety which can only be treated with

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adequate self health care, obtaining mental health guidance from the experts and continuous research on its treatment.

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## UTILIZATION OF PLASTIC WASTES AND ITS DERIVATIVES IN ROAD CONSTRUCTION

Sagar Srivastava<sup>1\*</sup>, Dr. Jayesh Juremalani<sup>2</sup> and Tejas Pandya<sup>3</sup><sup>1,2,3</sup>Civil Engineering Department, PIET, Parul University, Vadodara, Gujarat, India

\*Corresponding Author Email: sagsri0217@gmail.com

**ABSTRACT**

*With time mankind has realised the significance of sustainable and renewable resources and many research and innovations are taking place to help achieve this goal. Concepts like Green building, Green energy are gaining popularity in the same manner as new techniques and innovative ideas are coming into existence to deal with waste recycle and reuse endeavours. The technology as developed by Dr Vasudevan was already being used in different states of India in road construction. Researchers have studied various other approaches to use the plastic waste to make Green highways possible. Many of such studies have been listed below to make us understand its benefits and limitations to deal with plastic waste efficiently in road construction.*

**Sevil Kofteci et. al., 2016** <sup>[1]</sup> in their study wanted to see how HDPE (High Density Polyethylene) based plastic waste materials affected asphalt mixture performance. To do this, HDPE-based waste materials were added to penetration 50/70 grade bitumen as modifiers in amounts of 1%, 2%, 3%, and 4%, and then asphalt mixes created by the modified bitumen were tested to determine their performance. Initially Optimum Bitumen content was determined using the aggregate and bitumen with the Marshall Test. Modified Bitumen used in the study was formed by using the plastic waste in powder form and the sieve used to get the desired size of plastic powder was No. 40 Sieve. Plastic powder was added in 1%, 2%, 3%, and 4% and the respective percent modified bitumen was prepared by high RPM mixer to get the homogenous mix. Different asphalt mixture with Modified Bitumen of 1%, 2%, 3%, and 4% were obtained as HMA1, HMA2, HMA3, and HMA4 respectively. The stability and flow parameters of specimens were used to gauge their performance. Then, using the Indirect Tensile Test (ITT) method specified in AASHTO T283 using traditionally compacted specimens, the susceptibility features of the HMA to water damage were evaluated. The positive effect of HDPA can be seen in 3% and 4%. Mix resistance to detrimental effects of water was obtained with modified bitumen at 2% and 4%. In terms of stability values, the best results were obtained with a content of 4%.

**V.S. Punith et al., 2011** <sup>[2]</sup> in their study used the reclaimed polyethylene (PE) obtained from low-density polyethylene (LDPE) carry bags for modification of (80/100)-grade asphalt. A high-speed stirrer rotating at a speed of 3500 rpm was used to blending LDPE and binder for period of 25 minutes to get a homogeneous mix. Test samples were compacted using gyratory testing machine at various asphalt contents. The PMA blend with 5% PE content had the highest retained penetration value. Results obtained from loss on heating tests indicated that the loss in PE-modified binders was very low (0.075–0.097%) compared to a loss of 0.90% observed in the case of unmodified asphalt. The viscosity of the PE modified binder increases as the PE content is increased. It was observed that as the PE content is increased in binder, the mixing and compaction temperatures also increased. PE-modified mixtures displayed lower stripping compared to conventional asphalt mixtures. Retained Stability was found to higher in PE modified Binder and it increased as % of PE increased. Tensile strength ratio values of modified mixtures are more than that of conventional mixtures indicating that PE-modified mixtures are less susceptible to moisture damage. Mixtures with 5% PE content showed the least moisture susceptibility. Based on tensile strength ratio and retained stability test results, it was observed that PE-modified asphalt mixtures showed improved resistance to moisture induced damage. Beam fatigue tests were carried out on asphalt mixtures to evaluate engineering properties like fatigue life, stiffness modulus, dissipated energy and phase angle at 20, 30 and 40°C under constant strain-mode condition. At all tested temperatures, the flexural stiffness of the PE-modified mixtures were found to be comparatively higher than the conventional mixtures, whereas the dissipated energy and phase angle of the PE-modified asphalt mixtures were found to be comparatively lower than conventional mixtures. Fatigue life of the PE-modified mixtures increased by 2.5 times when compared to conventional mixtures. It was found that the thickness of the PE-modified asphalt mixture for a given traffic is substantially lower than the conventional mixture for a given practical thickness of granular bases.

**J.K. Appiah et al., 2017** <sup>[3]</sup> in their study examined the impact of mixing waste thermoplastic polymers, such as High density polyethylene (HDPE) and Polypropylene (PP), in Conventional AC-20 graded bitumen. The wet process was employed; Melt-blending was used to prepare the samples. Bitumen was heated in the oven until fluid, then polymer was gradually added. The mixer's speed was kept above 120 rpm, while the temperature was kept between 160 and 170 degrees Celsius. The percentage of PP and HDPE in the mix ranged from 0.5 percent to 3 percent by weight, with a 0.5 percent increase. To achieve homogeneous mixes, mixing was maintained for

30 minutes to 1 hour. The addition of thermoplastic modifiers to conventional bitumen is known to increase the viscoelastic behaviour and rheological characteristics of the bitumen. High density polyethylene (HDPE) and Polypropylene (PP) were employed as modifiers, and they were shown to have varying degrees of impact, such as raising the softening point and reducing the penetration value while enhancing the overall dynamic and absolute viscosities. For all of the modified bitumen samples, spectroscopic investigation using FTIR spectrophotometry revealed no new functions unique from the base binder's spectrum. This indicates that the polymer strands were successfully incorporated into the bitumen matrix. Within the study's constraints, the best findings for stable PMB suited for road construction were obtained with Polypropylene (PP).

**Hema H et al., 2019** <sup>[4]</sup> studied how partial replacement of Low Density Polyethylene (LDPE) wastes in bituminous pavement affected its performance when submerged in water for 1 to 4 days. To improve the performance characteristics of the pavement, LDPE films were utilised as a stabilising component. These were taken from a milk parlour. Low density plastic waste shredded into pieces of uniform size was employed as a partial replacement for bitumen in DBM. After obtaining the optimum binder content values the LDPE films were added. The LDPE was added at varying amounts i.e. 2%, 3%, 4%, 5%, 6% by weight of the optimum binder content to the samples. Wet process was adopted for partial replacement of bitumen with plastic in this experimental study. Various engineering properties were examined and compared between with virgin bitumen and with varying LDPE content. Mainly this study focused on the effect of LDPE waste on the Marshall stability and loss in stability by using retained Marshall Stability theory. The results concluded that 5% addition of LDPE gave the best results on all day of soaking. Hence LDPE is therefore can be recommended as a good hydro-carbon additive for the reduction in loss of stability. The maximum retained stability was obtained for 2% to 6% LDPE content were 84.21%, 94.34%, 92.3%, 100.83% and 83.85%. The addition of LDPE at 5% gives the highest value of 100.83%.

**R. Vasudevan et al., 2012** <sup>[5]</sup> in their study investigated that the Plastics waste like PP, PE and PS when coated over stone aggregate and the PCA thus formed mixed with bitumen can be used for flexible pavement construction. The hot PCA was mixed with 80/100 bitumen which was at 160 °C. The bitumen and PCA mix was subjected to tests like Stripping test, bitumen extraction test and Marshall Value determination test. Study showed that Polymer plastic namely PP, PE and PS get softened easily around 130–140°C without any evolution of gas and around 270°C they get decomposed. PCA showed nil value for soundness. The coating of plastics fills the pores and voids present at the surface of the aggregate. PCA show better resistance to higher wear and tear load. The film formed on surface of PCA helps in preventing the cracking on load. The toughness of the stones is also increased. Hence, the impact value of the PCA is lower when compared with the plain aggregate. The use of PP gives higher Marshall Stability Value (MSV) than PE. Higher percentage of plastics (more than 15%) results in lesser compatibility with bitumen and lesser bonding resulting in lower MSV. The MSV of PCA bitumen mix is compared with PMB mix and It was observed that the values of the PCA bitumen mix are 50–60% higher than that of the PMB mix, showing that the binding strength is higher in the case of PCA bitumen mix. Better stripping value observed due to PCAs surface covered by the polymer film and there are no pores. The molten polymer not only fills the voids of the aggregate and binds the aggregate together but also strongly binds with bitumen forming an organic bonding. Water cannot penetrate over PCA, hence peeling out of bitumen from the PCA is nil even after 96 hours.

**M R Afif et al., 2021** <sup>[6]</sup> in their study investigated the use of lignin as a coupling agent for mixing penetration grade 60/70 bitumen with LDPE waste. Marshall mix consisted of asphalt with penetration grade 60/70, rough aggregate and filler with LDPE from plastic waste and modified lignin, sodium lignosulfonate were used as modifiers of asphalt. Marshall stability test to determine the proportion of PMB was carried out for to determine the optimal proportion of binder content and result thus obtained was with about 5.65% asphalt + 6% LDPE, stability value improvement of 17% more than using only virgin asphalt. In lignin addition analysis, an increase in the value of the stability up to 89.5% after the addition of lignin was seen. Estimates of the mechanism of lignin as a coupling agent on asphalt and LDPE was examined by FTIR spectrophotometry and results indicated that the addition of 1% lignin can increase the stability of the pavement layer up to 89.5% compared to the use of only pure asphalt. These results are related with SEM and FTIR test results that the addition of lignin can improve compatibility between LDPE plastic waste and asphalt by optimum mixed proportion.

**Mohammed Abbas Al-Jumaili et al., 2020** <sup>[7]</sup> in their study tried to look into the effects of two types of polymers on rutting distress: Styrene-Butadiene-Styrene (SBS) and High-Density Polyethylene (HDPE). As a result, five ratios of SBS and HDPE (4 percent, 6 percent, 8 percent, and 10 percent) were employed as a percentage of total mix in order to acquire the best effect of each ratio using the Marshall test. Hence, the best ratios for surface (Type III A) layer are 8% HDPE and 6% SBS; whereas these ratios for binder layer are 6%

HDPE and 2% SBS. Furthermore, the permanent rutting resistant for surface layer has been assessed utilizing wheel track test consistent with (EN 12697-22, 2003). Using SBS reduces the depth of rutting to approximately 7mm which is approximately the half for the control mix. Similarly, using HDPE reduce the value of rutting depth up to half value for the SBS modifier. The results indicated that the reduction in the rutting percent were (72% and 65%) for HDPE and SBS for each type of additives at 40°C. Accordingly, this means these types of polymers have a significant role in reduction of rutting in surfacing and binder layers.

**A. Firdaus Mawardi et al., 2019** <sup>[8]</sup> in their study tried to analyze the influence of adding polyethylene terephthalate (PET) plastic bottle waste to asphalt concrete-binder course mix. The polyethylene terephthalate (PET) plastic bottle waste was added by cutting it into small pieces using specialized crushed machinery and blended with the 60/70 penetration asphalt, aggregates to produce a hot mix. While PET particles were added using various content ratios of 0, 1, 2, 3, 4, 5, 6, 7, and 8% at constant 5.8 % of optimum asphalt content. Results showed that the density was inversely proportional with the plastic content. The more plastic content was added, the less density was obtained. There was a slight decline in the density value up to 5.0% of plastic content then it went back up to 7%. More the PET plastic was added, the higher VIM value was obtained, yet there was a slight decline at 6–8%. The highest VIM was at 6.26% with plastic content at 5%. As the % of PET plastic increased, the more VMA was found. Yet, there was a slight decline at 6–8%. The highest VMA was at 16.11% when the plastic content was at 5%. As PET plastic was added, the less voids in asphalt were found. Yet, there was a slight increase at 6–8%. The highest VFA was at 66.45% when the plastic content was at 8% while the lowest VMA hit at 61.16% when the plastic content was at 5%. PET plastic addition to the mixture could decrease the number of voids filled in asphalt. As % of PET plastic increased, the more asphalt stability was obtained. The addition of PET plastic particles contributed to 40% increase in mixture stability. PET plastic addition increased the flow rate by 6%. PET plastic addition to the mixture could increase the Marshall quotient value by 60%. Finally it can be concluded that there was an increase in Stability, VIM, VMA, and Marshall Quotient went up as the number of density, VFA, and Marshall flow went down.

**Henok Addissie et al., 2018** <sup>[9]</sup> carried out the study where the effect of temperature on strain (deformation) were investigated on the rheology of two commonly used bitumens (40/50 and 85/100) in Ethiopia. Furthermore, the rheological properties of 40/50, 85/100, polyvinyl chloride (PVC) modified 40/50, low density polyethylene (LDPE) modified 40/50, PVC modified 85/100 and LDPE modified 85/100 binders were examined by penetration grade and SuperPave grading systems. The PVC and LDPE polymers were mixed with the two bitumen type from 0-7% and 0-9% respectively. The samples were tested for consistency, rotational viscometer and performance grading tests at different temperatures. Tests showed that 3% PVC and 5% LDPE modified binders had better penetration, softening point, ductility, viscosity and performance grade results for both 40/50 and 85/100 bitumen grades compared with the other percentages of the two modifiers. Thus, 40/50, 85/100, 40/50+3% PVC, 40/50+5% LDPE, 85/100+3% PVC, 85/100+5% LDPE were subject to additional Superpave rheology test like rolling thin film oven, amplitude sweep, multiple stress creep recovery, and Fourier transform infra-red tests. As seen from the Superpave test results, the PVC and LDPE modified binders had lower % heat loss, higher linear viscoelastic region (LVER), lower unrecoverable creep compliance and higher percent recovery than the unmodified bitumen in both 40/50 and 85/100 grades. Finally, it was concluded that the binder with penetration grade 40/50 and 85/100 were improved to 30/40 and 60/70 by both selected modifiers respectively. Those virgin bitumen grades were also improved from PG64-Z(40/50) to PG82-Z (by both modifiers), and from PG52-Z (85/100) to PG76-Z(by 3% PVC) and PG82-Z(5% LDPE) by Superpave grading.

**Pratiksha Singh Rajput et al., 2016** <sup>[10]</sup> in their study examined the use of waste plastic in various proportions (6 to 14 percent by weight of bitumen) by preparing Marshall mix for S.D.B.C. The Marshall properties of varying amounts of plastic waste in mixes were investigated. Plastic garbage such as carry bags was collected and shredded to size before being retained on a 600 micron sieve. The shredded plastic waste was mixed in the hot aggregates. Marshall Moulds were casted with bitumen of 4.5 percent, 5 percent, 5.5 percent, and 6 percent to determine the Optimum Bitumen Content (OBC). By adding plastic to heated aggregates, plastic modified mix specimens with plastic content of 6%, 8%, 10%, 12%, and 14 percent by weight of bitumen were created using a dry process. To investigate various factors, Marshall Tests were performed on plastic modified mix specimens. Results showed that with increase in the percentage of waste plastic, Marshall Stability value increased and maximum stability was found for the mix containing 12% plastic by weight of the bitumen. The flow value increased with the addition of plastic content in the mix. The % air voids in the mix decreases continuously while VFB continuously increases with the addition of the plastic waste in the mix. The optimum plastic content was obtained as 12% by weight of the bitumen content.

**Lilies Widodojoko et al., 2012** <sup>[11]</sup> in their study examined the effects of adding plastic and cement as ingredient to the mixture of asphalt concrete on the characteristics of Marshall. Plastics that are added are 2:4 and are 6%

in weight. It was observed that the optimum bitumen content on the addition of 4% plastic and Marshall stability increases by 19% compared to the AC-WC without addition of plastic..In this research, 4 Marshall mix designs were prepared with varying % of PET such as ACPlastic 0%, without plastic (PET), ACPlastic 2%, - mix with 2 % plastic (PET), ACPlastic 4% -mix with 4 % plastic (PET) , and ACPlastic 6% -mix with 6 % plastic (PET). Plastic content in percent was by weight of asphalt (Pen 60/70). Optimum Asphalt Content (OAC) was determined and parameters such as density, Void In Mix (VIM), Void In Mineral Aggregate (VMA), Void Filled With Asphalt (VFA), Stability, Flow, and Marshall Quotient (QM) were examined. Density of asphalt concrete mix without additive is higher than that of using added plastic. The addition of plastics caused an increase in the VIM value. The higher levels of plastic added, the higher the VIM value. Higher the percentage of plastic, higher the value of VMA obtained. The addition of plastic content decreased the VFA values along with increasing level of plastic content. The maximum stability was obtained with plastic content of 4%.This is equal to increase of 23.5%, from the mixture without plastic against the mixture with plastic content of 4%.

**Brajesh Mishra, 2016** <sup>[12]</sup> studied the various engineering properties of bituminous mixes of flexible pavements by utilizing shredded waste plastic carry bags made of low density polyethylene (LDPE) by wet and dry methods. The processed waste plastic (LDPE) from the garbage of local area in the shredded form was used as additive. The shredded waste plastic was cut into pieces of uniform size between 2.36 – 600  $\mu$ .The shredded plastic was incorporated by wet and dry process in percentages ranging from 5% to 11% by weight of OBC of conventional mix with an increment of 2%. The Marshall stability, flow value and other parameters were obtained by conducting laboratory testing. It was observed that the maximum value of Marshall stability was observed at plastic content of 9% for both dry and wet mixes .It was also observed that here was an increase in Marshall stability value of 21.87% for wet mix and 38.47% for dry mix as compared to conventional mix of bituminous concrete. It was also observed that here was an increase in Indirect tensile strength by 4.7% for wet mix and 16.97% for dry mix as compared to conventional mix of bituminous concrete. There was a decrease in flow value by 22.56% for wet mix and 28.65% for dry mix as compared to conventional mix. It was observed that the dry mix can handle greater stresses and hence it is the suitable option for improvement in quality of flexible road pavements for incorporating waste plastics. Plastic waste modified mix is resistant even when subjected to worst moisture condition. Physical properties like Aggregate Impact Value, Los Angeles Abrasion Value, Water Absorption Value and soundness etc. of plastic coated aggregates (PCA) were improved appreciably as compared to conventional aggregates (without plastic coating) due to thin plastic coating over aggregates.

**Mekonnen Yetmgeta et al., 2020** <sup>[13]</sup> in their study tried to investigate if the use of waste plastic bottles as a partial replacement for aggregate in a bituminous concrete mix through the dry process could improve the desired performance of the mixture. The optimal bitumen content for traditional bitumen concrete mix was discovered to be 5.33 percent, on which the influence of PET bottles was tested. Plastic bottles that have been discarded are gathered and chopped into small bits with scissors. After that, it was melted in an oven at 180 degrees for 30 minutes. It was then crushed after cooling. Finally, after weighing the needed amount of crushed plastic and substituting the aggregate by 0%, 4%, 6%, 8%, and 10% by weight of aggregate, the marshall test was conducted and volumetric properties for each specimen was examined. Result thus obtained showed that Specimen with the optimum plastic content has higher stability; high bulk density and minimum air void values. The optimum plastic content is selected at 4% of the plastic bottle by weight of aggregate. Finally, this study concluded that partial replacement of aggregate by the waste plastic bottle can increase the overall performance of bitumen concrete mix.

**Dr. S. L. Hake et al., 2020** <sup>[14]</sup> in their study examined the utilization of plastic waste (PET) in Semi dense Bituminous Concrete (SDBC). The plastics from PET jugs to be utilized in blends for examine work. The measurements of plastic of 5 %, 7.5%, 10 %, 12.5% and 15 % utilized as substitution of bitumen. The advance plastics content is 10% with 5.25 % of bitumen content. The Marshall Stability of virgin SDBC mixes at optimum bitumen content showed 1.6% lower when compared with modified SDBC mixes with waste plastic. The bulk density of virgin SDBC mixes at optimum bitumen content showed 0.43% higher when compared with modified SDBC mixes with waste plastic. The volume of Air Voids of virgin SDBC mixes at optimum bitumen content showed 8.1% lower when compared with modified SDBC mixes with waste plastic. Voids filled with bitumen for virgin SDBC and plastic modified SDBC mixes were within the limits specified by MORTH and VMA for both virgin SDBC and modified mixes were within the limits. The SDBC mixes with 10% waste plastic exhibited better results for Marshall, Hence use of waste plastic may be recommended. With the increase of waste plastic in bitumen increases the properties of aggregate and bitumen. It is observed that, using plastic waste in bituminous mixes, the life of the road is increased and hence the maintenance expenditure

is reduced. From cost analysis of project it is observed that, percentage cost reduction for one cum material mix is 5.18%.

**Utibe J. Nkanga et al., 2017** <sup>[15]</sup> in their study, waste plastic materials including low density polyethylene (LDPE) grocery bags, etc. in various proportions of polymeric materials (5%, 10% and 15%) were blended and the bituminous mix so prepared were investigated. Marshall Stability, extraction, sieve analysis, water absorption tests, and bulk density were used to assess the strength and performance of bitumen/plastic blends. The results concluded that the bitumen/plastic blend has higher Marshall Stability of range 14.03 to 14.80 kN compared to the conventional bituminous mix sample which value was 11.35 kN. They also showed higher air voids, lower bulk density and Marshall flow than the conventional bituminous mix. The results from the proportions of aggregate and quarry dust (40:60, 50:50 and 60:40) used in the sieve analysis showed ratio 50:50 to be more appropriate for the bitumen/plastic blends. Using the bituminous mix with the addition of the plastic waste to about 5% to 15% by % weight of bitumen also helps improving the fatigue life of the bitumen. This also improved the durability and shows high performance rate. Based on the findings, it can be inferred that liquid polymers such as PE and PS have strong adhesive qualities.

### CONCLUSION

We can see different studies envision different approaches to deal with the various forms of plastics being used and examine how the different types of plastics have different advantages and limitations when incorporated in the construction of roads. Various parameters in design, application, load bearing capacity as well climatic conditions were tried and tested on the mixes produced with plastics and different conclusions were put forward in their respective studies. This study will help in the selection of the type of plastic and the method of utilization for such plastics which can provide better results for their requirements and needs. Much of the innovation can be done by following in their footsteps and new approaches to deal with waste plastics can come into existence to create economic, eco-friendly, and sustainable roads for the betterment of future generations.

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**TO ASSESS THE EFFECTIVENESS OF PLANNED TEACHING ON KNOWLEDGE REGARDING CADVERDONATION AMONG ADULTS IN RURAL AREA**

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**Prof Archana Maurya<sup>2</sup>, Ms. Karishma Wanjari<sup>2</sup>, Mr. David Wanmali<sup>2</sup>, Mr. Atul Warutkar<sup>2</sup>, Ms. Snehal Wasekar<sup>2</sup> and Ms. Bhagyashri Watmode<sup>2</sup>**

<sup>1</sup>Professor, Department of Child Health Nursing, Smt. Radhikabai Meghe Memorial College of Nursing, Sawangi (M) Wardha, DMIMS (Deemed to be University Maharashtra, India

<sup>2</sup>Basic B.Sc. Nursing Students Smt. Radhikabai Meghe Memorial College of Nursing, Sawangi (M) Wardha, DMIMS (Deemed to be University Maharashtra, India

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**INTRODUCTION**

*The donation of organs from a brain dead or dead person is known as Cadaver donation. Many adults are unaware of cadaver donation in the rural areas; hence the researcher had to impart awareness about cadaver donation among the adult population so that their attitude will gradually diversify in the future. Aims: - The study aims to evaluate the effectiveness of planned teaching regarding cadaver donation among adult in the rural area and find out the association of knowledge score with selected demographic variables. Material and method: - In this Evaluatory approach was used. Pre-test and post test design was used. The study held among adults between the age group of 19years to 30years the data was collected in the rural area of Seloo taluka at Wardha district on 22<sup>nd</sup> January to 28<sup>th</sup> January 2019. The researcher selected one adult from an individual family sample technique was non-probability convenience sampling was used total of 60 samples was collected. Results:-In the study 50% of sample belonged to the age group of (19 to 21 years) 51.6%of sample were males, 40 % of samples were graduate, 45 % of the sample had knowledge about cadaver donation out of which 15% of samples had knowledge from newspaper and mass media. The mean post-test knowledge scores 13.53 were higher than mean pre-test knowledge score 4.15 and the obtained mean difference of 9.38 was found to be statistically significant. Conclusion: - It is concluded that there was an evidence to increase the knowledge score after administration of the planned teaching. The actual gain score was significantly higher, improving in the knowledge regarding cadaver donation among adults in the rural area. Thus the planned teaching was effective.*

*Keywords: - Effectiveness, Cadverdonation, Planned Teaching, knowledge. Adults*

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**INTRODUCTION**

Cadaver donation meaning donation of organs i.e; to take organs such as heart, eyes, kidney, pancreas, etc from the brain dead patient, also tissue donation which is to take tissues such as skin, corneas, etc from the brain deceased and heart deceases patient. This process is beyond the extent of the pathologist; therefore it is done by surgeons in the operation theatre. In a wider range, the pathologist plays an important role in the cadaveric tissue donating process, as well as collecting tissues from a cadaver for analysis procedures within the framework of the autopsy i.e.; fluid, organs, tissues samples) and to collect material for study and training students and pithily residents[1]

A dead human body is known as a cadaver, who is used by the students of medical, scientists, and medical researchers to analyze anatomy, identify disease sites, determine the cause of death, and give tissue to heal a flaw in a living human being. Medical school students use cadaver to study and dissect, as a part of their education. Other people who study cadavers include archaeologists and artists. [2] In the rural area, the young adult does not have any idea about cadaver donation, therefore the researcher takes initiative to fulfill the need of the society by spreading the awareness about the topic among the young adult, it will help people in the society adopt positively in future and accept So that this will help to many people who require organ and to strengthen the cadaver donation through a health care professional.[3]

Farah Khalid (2019) conducted on the study in Karachi, the study result shows that the knowledge score was about (25.8%) total samples were 395 participants out of them only 101 participants had knowledge about organ donation. This is huge evidence that people are unaware of organ donation. [4] find out the result of other studies the rural population had less knowledge about organ donation than the urban population.[5] In a rural community, most of the people have discrepancy about brain death because of less knowledge, misconception, false beliefs, religious myths, and fear about commercial usage of organ donation by doctors and searcher these are some of the reasons which lead refusal of organs donation by the rural families.[6] A study took place in Konkan Region, Maharashtra the finding shows that participants had good awareness about eye and kidney donation but they had poor awareness about body donation range between 21% and 40%. However, there is a lack of understanding regarding the concept of brain-death, so needs to further awareness.[7]

A study was conducted in the Vidharbha region in 2019 after finding research recommended for creating awareness of organ donation among young adults. Motivational communication and educational tools such as lectures planned teaching advertisements, and exhibitions can improve the awareness and attitude about organ donation among young adults.[8]

Therefore, the present study was done to provide knowledge through planned teaching regarding cadaver donation and evaluate their knowledge regarding cadaver donation of adults from a rural area.

### MATERIAL AND METHOD

The researcher used quantitative design in this study. The study was conducted in a rural area of the Wardha district and the data was collected from the rural area of Seloo taluka, Wardha. The research study took place 6 months. The data was collected from 22<sup>nd</sup> January to 27<sup>th</sup> January 2019. The investigator structured questionnaire was used to collect the data. The tool was validated by nine subject experts for more clarity and reliability to conduct the study which was in English and Marathi. The questionnaire was prepared based on published research articles reviews and books; a questionnaire based on general and specific information about cadaver donation from PUBMED, CINAHL, and Google Scholar, etc.

The structured questioner is used for data collection it was divided into two sections, Section A based on demographic data about participants and section B knowledge-based 20 MCQ questions related to cadaver donation. In the questions information related to meaning, concept, laws criteria, and procedure of cadaver donation are included.

The Spearman-Brown prophecy formula used for reliability. The reliability co-efficient was calculated. The reliability co-efficient 'r' of the questionnaires was 0.837, which is more than 0.8. Hence the questionnaire was found reliable.

### THE FORMULA FOR A SAMPLE CALCULATION

The sample consists of the units which comprise the population. Sixty (60) adults were selected using the calculated formula to suit the study.

$$N = 4 * p * q$$

$$L^2$$

= 54.54 = 60 subjects needed in the study. In the study, all the 60 samples were present during the pretest, planned teaching, and posttest, no sample dropped out of the study.

The population of the study was adults who were fulfilling the inclusion criteria. In the inclusion criteria of the study are adults who were willing to participate in the study, available at the time of data collection, those who were in the age group of 19 to 30 years. Only one participant selected for the individual family if more than one participant present in the family in that case only one sample collected by using chit for selection of a sample from family. We excluded the adults those who were having severe disease condition like kidney disease, heart disease, and blood disease, who were physically handicapped, who were having congenital anomalies.

**Ethical considerations** The permission obtained from Institutional Ethical Committee Board, Datta Meghe Institute of Medical Sciences (Deemed to be University), (Ref.No. DMIMS (DU)/IEC/2018-19/7668, Date: 27.12.2018) India. The investigator approached adults under age group and prepared a sampling frame of those who met the inclusion criteria then researcher approached participants at their home and explained the purpose of the study and how it will be beneficial for them. Investigator enquired about their willingness to participate in the study and obtained written consent from them. The participants were assured about the confidentiality of their information and its applications only for this study.

The Gram panchayat hall obtained from prior permission of the Gram Sarpanch. The

Investigator collected all the participants in Gram Panchayat hall at Seloo it was nearby their homes. The investigator administered pre-test questionnaires in the Marathi language and gave necessary instruction. Once the pre-test questionnaire completed, the investigator collected it back within 30 minutes after which planned teaching was delivered in the Marathi language about cadaver donation to all participants. On the 7<sup>th</sup> days of planned teaching the post-test was administered, after 30 minutes the post-test was collected and data collection process was over, the investigator thanked all the study samples as well as authorities for their co-operation.

### SCORING

- Score 1 was given for the correct answer.

- Score 0 was given for the wrong answer.
- Knowledge was graded from poor knowledge to excellent based on scores.

Each knowledge question was given a weighted score and the total knowledge score was calculated. The score was divided into four groups, lowest score indicated poor, average, good and Higher score indicated excellent knowledge about cadaver donation, the maximum possible score was 20 all the data were entered into Micro Worksheet and were analyzed using the Statistical Package for the Social Science software (SPSS Inc. Chicago IL, USA) Version 21.0)

The collected data were coded, tabulated and analyzed by using descriptive statistics (mean percentage, standard deviation) of Knowledge regarding cadaver donation and inferential statistics used for significant difference between pre and post-test used by paired “t”-test and associated of knowledge with demographic variables were done by one way ANOVA and unpaired “t” test.

**Result** The analysis and interpretation of the data are organized under three sections as per the objectives of the study.

**[Table/Fig-1]: Percentage-wise distribution of subjects according to their demographic variables**

n=60

Demographic variables	Frequency	Percentage (%)
<b>Age (years)</b>		
19 to 21 years	30	50%
22to 24 years	10	16.6%
25 to 27 years	13	21.6%
28 to 30 years	7	11.6%
<b>Gender</b>		
Male	31	51.6%
Female	29	48.3%
<b>Marital status</b>		
Unmarried	40	66.6%
Married	20	33.3%
<b>Religion</b>		
Hindu	49	81.6%
Muslim	6	10%
Christian	2	3.3%
Other	3	5%
<b>Education</b>		
Primary	8	13.3%
Secondary	22	36.6%
Graduation	24	40%
Post graduation	6	10%
<b>Type of family</b>		
Nuclear	16	26.6%
Joint family	38	63.3%
Extended family	6	10%

**[Table/Fig-2]: Effectiveness of pre-test and post-test knowledge score regarding cadaver donation**

n60

Level of knowledge score	Percentage score	Knowledge score	
		Pre-test	Post-test
Poor	0 – 25 %	50 (83.4 %)	0 (0 %)
Average	26 – 50 %	9 (15%)	7 (11.6%)
Good	51 – 75 %	1 (1.6%)	38 (63.4%)
Excellent	76 – 100 %	0(0 %)	15 (25 %)

Minimum score	0	6
Maximum score	11	20
Mean score	4.15± 1.938	13.53 ±3.111
Mean %	20.75 ± 96.9	67.65± 5.185

[Table/Fig-3]: Effectiveness of planned teaching regarding cadaver donation among adults in rural area.

n=60

Overall	Mean	SD	Mean difference	t-value	p-value
Per-test	4.15	1.93	9.38 ± 3.61	20.11	0.001 S, p < 0.05
Post-test	13.53	3.11			

This table shows the comparison of pre-test and post-test knowledge scores of adults concerning knowledge of cadaver donation. Mean, standard deviation, and mean difference values are compared and students paired 't' test is applied at a 5% level of significance. The tabulated value for n=60-1 i.e. 59 degrees of freedom 2.00. The calculated 't' value is much higher than the tabulated value at a 5% level of significance for the overall knowledge score of adults which is the statistically acceptable level of significance. Hence it is statistically interpreted that the planned teaching on overall knowledge regarding cadaver donation was effective. Thus, H<sub>1</sub> is acceptable.

[Table/Fig-4]: Regression Analysis of planned teaching knowledge score with demographic variable regarding cadaver donation among adults in rural

Model		Unstandardized Coefficients		Standardized Coefficients	t	p-value
		b	Std. Error	Beta		
V A R I A B L E S	Knowledge	16.557	4.333			
	Age	0.721	0.505	0.252	1.427	0.160,NS
	Sex	0.217	1.134	0.035	0.192	0.849,NS
	Marital Status	-0.136	1.176	-0.021	0.116	0.908,NS
	Religion	-0.664	0.592	-0.164	1.122	0.267,NS
	Education	-0.532	0.592	-0.142	0.898	0.374,NS
	Type of family	0.486	0.713	0.092	0.682	0.499,NS
	Knowledge about Cadaver donation	-1.951	1.291	-0.331	1.511	0.137,NS
	If yes	-0.195	0.440	-0.082	0.444	0.659,NS

By using multiple correlation coefficient no demographic variables were associated with knowledge score of adults (p>0.05)

**DISCUSSION**

In our study the pre-test mean percentage of knowledge regarding cadaver donation was 20.75% and post-test knowledge mean percentage was 67.65% after given the planned teaching the knowledge about cadaver donation was increased 46.9 % hence the planned teaching effective. A similar community-based study was conducted in Puducherry, 100 samples were used in the rural service area 66% of knowledge was improved regarding organ donation after planned teaching.

. A similar community-based study was conducted in Puducherry. The objective of the study was to assess the effectiveness of planned teaching on organ donation among young adults in rural the area. The 100 samples were used in the rural service area. 66% of knowledge was improved regarding organ donation after planned teaching. This study supported to my study.[9]

In a study, the sample was taken age 19yrs- 30yrs adult from the rural area. In my study R, Alarcon conducted a similar study in Spain aim at the effectiveness of an education program regarding organ donation and transplantation in 157 students between 15-36 years at their educational institution in Malaga. The analysis report indicated that the education program was effective to increase in the level of awareness about organ donation and transplantation. Awareness provides positive changes in organ donation and transplantation.[10]

In my study, the similarity of adult age 19 to 30yrs and education program also help to increase the level of knowledge regarding cadaver donation.

Shah R has conducted a similar type of study in the participants they have Poor (64.9%) or moderate (35.1%) knowledge about organ donation.[11] A study from Nigeria showed that the willingness to donate an organ was significantly associated with younger age, but not with gender.[12] According to the study of Saad A, 30.5% have heard about brain death and 69.5% have not heard about brain death or cadaver donation.[13] Our study showed a slightly lower prevalence of adequate knowledge (66%) regarding organ donation when compared to 88% who have heard about organ donation in another study.[14]

### **CONCLUSION: -**

It is concluded that there was an evidence to increase the knowledge score after administration of the planned teaching. The actual gain score was significantly higher, improving in the knowledge regarding cadaver donation among adults in the rural area. Thus the planned teaching was effective. No association found in knowledge score with demographic variables.

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## COROSOLIC ACID – A MINI REVIEW

Shivani Dhiman, Jyoti Saharan, Vineet Mittal

## ABSTRACT

At present, the pharmaceutical sector in India is making use of 280 medicinal plant species, of which 175 are found in the international health regulations (IHR). The medicinal plants treated various ailments like diarrhoea, dysentery, bronchitis, menstrual disorders, gonorrhoea, pulmonary affections, migraines, leprosy. The old Indian Systems of Medicine (ISM) are among the most ancient medical traditions known, and derive compounds or active molecules that serve as precursors to biosynthesized secondary metabolites from plants and plant extracts. Corosolic acid (CA) is one such most popular natural compound because of its insulin-like and anti-cancer activities. CA, a triterpenoid also named 2 $\alpha$ -hydroxyursolic acid, is considered a potential active constituent. The contribution of CA to drug discovery thus needs to be put into prospective due to its ready availability, high potential applications.

## INTRODUCTION

CA (2 $\alpha$ , 3 $\beta$ -dihydroxyurs-12-en-28-oic acid, 1) is the major pentacyclic triterpene in Banaba (*Lagerstroemia speciosa* L.) leaves which has been used as a traditional oriental medicine to treat diabetes, polyuria and polydipsia, it is also abundant in *Eriobotrya japonica* and *Weigela subsessilis*. It is an interesting leading compound of versatile pharmacological activities, such as anti-diabetic, antiobesity, antioxidant, cytotoxicity, anti-inflammatory and anti-hypertensive and used in dietary supplements as a glucose lowering agent and insulin mimetic.

Due to such activities, the preparation of derivatives of CA for structure activity relationship (SAR) studies has attracted recent attention (Feng *et al.*, 2014). It is similar in structure to ursolic acid, differing only in the fact that it has a 2- $\alpha$ -hydroxy attachment (Ashnagar *et al.*, 2013).

## OCCURRENCE

CA is useful as an ingredient in medicines, cosmetics and health foods, and was discovered in *Eriobotrya japonica* Lindl. (loquat), *Lagerstroemia speciosa* L. (banaba), *Rhabdosia japonicas* Hara (Isodonis Herba), *Epilobium angustifolium* L. (fireweed), *Elliottia paniculata* (Hotsutswuji), *Weigela subsessilis*, *Eriobotrya japonica* (Feng *et al.*, 2014), *Vaccinium macrocarpon* (cranberry), *Ugni molinae*, *Perilla frutescens*, *Glechoma longituba*, *Potentilla chinensis*, *Rubus biflorus*, and *Phlomis umbrosa* and was discovered in *Camptotheca acuminata*, *Crataegus pinnatifida*, *Psidium guajava*, *Tiarella polyphylla* and many other plants (Chen *et al.*, 2011). Many of these plants are native to Asia, although CA has also been isolated from European and South American plants (Miura *et al.*, 2012).

## PHYSICAL AND SPECTROSCOPIC DATA

**Synonyms:** Corosolic acid; 2  $\alpha$ -Hydroxyursolic acid; Colosolic acid; Corsolic acid; Glucosol; (2  $\alpha$ , 3  $\beta$ )-2, 3-Dihydroxyurs-12-en-28-oic acid; (1S, 2R, 4aS, 6aR, 6aS, 6bR, 8aR, 10R, 11R, 12aR, 14bS)-10, 11-Dihydroxy-1, 2, 6a, 6b, 9, 9, 12a-heptamethyl-2, 3, 4, 5, 6, 6a, 7, 8, 8a, 10, 11, 12, 13, 14b-tetradecahydro-1H-picene-4a-carboxylic acid (Jemmali *et al.*, 2016).

## Physical properties

**Table 1:** Physical properties of CA (Jemmali *et al.*, 2016).

Molecular weight	472.70 g/mol
Molecular formula	C <sub>30</sub> H <sub>48</sub> O <sub>4</sub>
CAS registry number	4547-24-4
Melting point	243 ~ 245°C
Solubility in water	Partially soluble
Stability	Stable under normal conditions
Incompatible	Strong oxidizing agents
Assay	98.0% min (on anhydrous basis)
Loss on drying	5.0% max
Heavy metals	20ppm max
Packing	Preserve in light-resistant and well-closed containers

**GC–FID analysis for the optimization of the derivatization method:**

For optimization of the derivatization step, a gas chromatograph equipped with a split-splitless injector and a flame ionization detector (FID) detector was used. The injector temperature was set at 300 °C. A Restek Split/Splitless Sky™ inlet liner was used. A 1 ml injection was performed in splitless mode for 1.30 min. The analyses were performed on a 0.25 mm diameter, 30 m length and 0.5 mm film thickness DB-5MS capillary column (Agilent). The oven temperature was initially set at 200 °C with a 1 min hold, and then ramped up to 290 °C at a 25 °C min<sup>-1</sup> rate, followed by a ramp at 10 °C min<sup>-1</sup> to 330 °C with a 1 min hold. Hydrogen was used as carrier gas at 1.2 ml min<sup>-1</sup> constant flow rate. The temperature of the FID detector was held at 350 °C with 35 mL.min<sup>-1</sup> hydrogen and 350 ml min<sup>-1</sup> air flow-rates. A nitrogen make-up gas flow rate was set at 40 ml min<sup>-1</sup>. GC–MS analysis for plant extract: a Trace Ultra-ISQ gas chromatograph single quadrupole mass spectrometer equipped with a programmed temperature vaporizing injector (PTV) and a 2 mm diameter Thermo PTV liner was used. Initially the temperature of the injector was set at 55 °C for 0.05 min (injection) followed by a 14.5 °C min<sup>-1</sup> ramp to 100 °C (evaporation) and a 14 °C min<sup>-1</sup> ramp to 350 °C (transfer), with a split flow of 50 ml min<sup>-1</sup>. Hydrogen was used as a carrier gas at the flow-rate of 1.2 ml min<sup>-1</sup>. A Rtx-5ms capillary column 60 m length, 0.25 mm internal diameter, and 0.25 mm film thickness (Restek) was installed in the GC oven. Initially the temperature of the GC oven was set at 100 °C for 1 min followed by a 20 °C min<sup>-1</sup> ramp to 280 °C and a 5 °C min<sup>-1</sup> ramp to 330 °C with a 6 min hold. For the data acquisition using the Electron Impact (EI) mode, the temperature of the transfer line and the ion source was held at 315 °C and 250 °C, respectively. A mass range (m/z 35–700 amu) was scanned in full scan acquisition mode with a total scan of 0.204 s. For chemical ionization (CI) methane was used as reagent gas in positive ion mode. The transfer line and ion source temperature were held at 300 °C and 225 °C, respectively. Data acquisition was obtained from m/z 35– 700 amu in full scan acquisition with a total scan time of 0.204 s. For both ionization modes, a 6.5 min solvent delay was applied after the injection. In EI mode, the mass spectra obtained were compared against those of the NIST library. For Single Ion Monitoring (SIM) analysis, three characteristic ions of each compound were chosen and monitored. The selected ions are shown below (Jemmali *et al.*, 2016).

**HPLC separation and mass spectrometry identification**

Several chromatographic parameters were investigated in detail, to obtain a set of suitable separation conditions. In the study, Hypersil C18 (4.6 mm × 200 mm, 5 m) column, ZORBAX SB-C18 (4.6 mm × 150 mm, 5 m) column, Eclipse XDB-C8 (4.6 mm × 150 mm, 5 m) column, Hypersil BDS C8 (4.6 mm × 200 mm, 5 m) column, Akasil-C18 column (4.6 mm × 250 mm, 5 mm) and Spherisorb C18 (4.6 mm × 200 mm, 5 m) column were evaluated and compared. The analysis results revealed that good separation could obtain on Hypersil C18 (4.6 mm × 200 mm, 5 m) column. Due to the hydrophobic character of the triterpenic acids derivatives, methanol-water and acetonitrile-water were investigated and compared as mobile phases. The flow rate was set at 1 ml min<sup>-1</sup> and injection volume 10 L. The results suggested that a better separation and peak shape was obtained, when acetonitrile-water was selected as mobile phase. Finally, the optimized chromatographic conditions were as follows: analytical column, Hypersil C18 (4.6 mm × 200 mm, 5 m) column; flow-rate, 1 ml min<sup>-1</sup>; volume injected, 10 L; temperature, 30 °C and mobile phase, acetonitrile–water. In the present study, the chromatogram peak of analyte was doubly confirmed by comparing its retention time and online mass spectrometry identification. Obviously, maslinic acid derivative has the protonated molecule ([M+H]<sup>+</sup>) peak at m/z 768.18 with fragments at m/z 295.92, 499.24 and 544.25, which were characteristics to maslinic acid derivative. Thus, the characteristic molecular ion and its fragments could be helpful for identifying related triterpenic acid derivative (Wu *et al.*, 2015).

**Estimation of CA by HPTLC method:**

To estimate the content of CA in *Lagerstroemia speciosa* L. leaves and extracts samples, aliquots of 10 µl were spotted with a Camag microlitre syringe on a pre-coated silicagel aluminum plates 60 F – 254 (20 nm x 10nm) with 250 µm thickness, (E. Merck, Darmstadt, Germany) using a Camag Linimat IV (Muttentz, Switzerland) applicator. Linear ascending development was carried out in 20 cm x 10 cm twin trough glass chamber (Camag Muttentz, Switzerland) using mobile phase consisting of chloroform: methanol (9: 1). The length of the chromatogram run was 8 cm. After air drying, the TLC plates were scanned with a Camag TLC scanner-III in absorbance mode at 210 nm, controlled by Cats software 4.03 version. Since the retention time of the CA was 9.4 ± 0.4 min. The content of CA was calculated by linear regression and mean percentages were calculated from six replicate experiments. In case of dosage forms, mean mg / capsule or tablet calculated from six replicate experiments. The selected mobile phase produced highly symmetrical peaks showing good resolution. The R<sub>f</sub> value of CA was found to be 0.40 ± 0.03 (Vijaykumar *et al.*, 2006).

## APPLICATIONS

### Anticancer activity

CA (2a-hydroxyursolic acid) was also found to decrease the level of intracellular b-catenin and to suppress the growth of APC-mutated colon cancer cells. CA exerts their anticancer activities against colon cancer cells by promoting the N-terminal phosphorylation and subsequent proteasomal degradation of b-catenin (Kim, 2014).

CA induces sub-G1 cell cycle arrest and causes apoptotic cell death in human lung adenocarcinoma A<sub>549</sub> cells in vitro. CA also triggers the activation of caspases and poly

(ADP-ribose) polymerase, an effect antagonized by z-vad-fmk. In addition, exposure to CA

leads to a significant increase in the levels of reactive oxygen species (ROS) in A<sub>549</sub> cells. CA induces mitochondria-mediated and caspase-dependent apoptosis in A<sub>549</sub> cells by altering anti-apoptotic proteins in a ROS-dependent manner (Nho *et al.*, 2013).

### Anti-diabetic activity

In a study, 31 subjects were orally administered 10 mg CA or a placebo, on different occasions, in a capsule 5 min before the 75 g oral glucose tolerance test (OGTT) in a double-blind and cross-over design. Nineteen subjects had diabetes, seven had impaired glucose tolerance, one had impaired fasting glucose, and four had normal glucose tolerance according to the 1998 WHO criteria. There were no significant differences in plasma glucose levels before and 30 min after the administration. CA treatment subjects showed lower glucose levels from 60 min until 120 min and reached statistical significance at 90 min. It is showed for the first time that CA has a lowering effect on post challenge plasma glucose levels in vivo in humans (Fukushima *et al.*, 2006).

In a study, subjects received a daily oral dose of Glucosol TM and blood glucose levels were measured. Glucosol TM at daily dosages of 32 and 48 mg for 2 weeks showed a significant reduction in the blood glucose levels. Glucosol TM in a soft gel capsule formulation showed a 30% decrease in blood glucose levels compared to a 20% drop seen with dry-powder filled hard gelatin capsule formulation ( $P < 0.001$ ), suggesting that the soft gel formulation has a better bioavailability than a dry-powder formulation (Judy *et al.*, 2003).

CA enhances glucose uptake in L6 myotubes and facilitates glucose transporter isoform 4 translocation in CHO/hIR cells. These actions are mediated by insulin pathway activation and can be blocked by phosphatidylinositol 3-kinase (PI3 Kinase) inhibitor Wortmannin. Furthermore, CA inhibits the enzymatic activities of several diabetes-related non-receptor protein tyrosine phosphatases (PTPs) in vitro, such as PTP1B, T-cell-PTP, src homology phosphatase-1 and src homology phosphatase-2 (Shi *et al.*, 2008).

### Antioxidant, Anti-inflammatory and Anti-hypertensive activity

Six-week-old male SHR-cp rats were fed a high fat diet containing 0.072% CA for 14 weeks. Treatment with CA lowered blood pressure, which was elevated in control animals, by 10% after 8 weeks, and serum free fatty acids by 21% after 2 weeks. CA treatment resulted in decreases in the levels of the oxidative stress markers thiobarbituric acid-reactive substances and 8-hydroxydeoxyguanosine by 27% and 59%, respectively, after 2 weeks. CA treatment also reduced the levels of myeloperoxidase markers, 3-nitro-tyrosine and 3-chlorotyrosine by 38% and 39%, respectively, after 10 weeks, and tended to decrease the levels of high sensitivity C-reactive protein, a marker of inflammation, after 6 weeks. However, CA had no effect on weight gain or hyperglycemia. These results demonstrate that CA can ameliorate hypertension, abnormal lipid metabolism, and oxidative stress as well as the inflammatory state in SHR-cp rats. This implies that CA can be beneficial for preventing atherosclerosis-related diseases that are an increasing health care problem worldwide (Yamaguchi *et al.*, 2006).

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**THE INTEGRATION OF CONVENTIONAL AND SUSTAINABLE EQUITY INDEX: EVIDENCE FROM DEVELOPED AND EMERGING MARKETS**

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**Satyaban Sahoo<sup>1</sup> and Dr Sanjay Kumar<sup>2</sup>**Research Scholar<sup>1</sup> and Assistant Professor<sup>2</sup>, Department of Management, Central University of Rajasthan, Bandarsindri, Kishangarh - 305 817, Ajmer, Rajasthan (INDIA)

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**ABSTRACT**

*This study examines the integration of sustainable indices with conventional stock indices within developed (USA and UK) and emerging markets (China and India). The Morgan Stanley Capital International (MSCI) ESG and MSCI conventional indexes are considered from 01st August 2011 to 31st July 2021. The Johansen co-integration test examines the integration of the selected countries' sustainable and conventional equity indices, and the Granger causality test is used to evaluate causality. The results suggest that sustainable indices are not co-integrated with conventional indices in all countries. Furthermore, the study finds unidirectional causality running from both sustainable and conventional indices of the USA and UK to both indices of India. The conventional index of the USA causes China's conventional index; however, the USA's both sustainable and conventional indices are caused by indices of the UK. The impulse response function also confirms the results of the Granger causality test. Therefore, the study advises that portfolios should take both indexes into account to diversify risk and hedge.*

*Keywords: Sustainable Index, Conventional Index, MSCI, Johansen's Cointegration Test, Granger Causality Test, IRF*

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**1. INTRODUCTION**

The principle of responsible investment enables businesses to include environmental, social, and governance (ESG) concerns in their investment plan. As a result of growing investor interest, ESG activity has expanded in the recent decade, with global assets implementing ESG principles exceeding USD 60 trillion in 2016 (Amir & Serafeim, 2018). Given the growing awareness of environmental stability, socio-economic development, and adherence to ethical norms, the emphasis on sustainable and responsible investment techniques has progressively increased. The apparent lack of governance during the global financial crisis, the growing threat of global warming, social activism, and other factors have recently led to an agreement on the importance of holistic growth and sustainable investment. Socially responsible investing is a concept that evaluates investments in terms of both ethical and financial rewards (Jain et al., 2019). The core idea of ESG-based investment is to discover and quantify the intangible value possessed by socially responsible, environmentally conscious companies with sound governance procedures. These companies are thought to have better risk management strategies on ESG factors, resulting in value for investors through long-term sustainable business models (IISL, 2018).

In a competitive market economy, all economic players continuously compare their performance to their peers in relative and absolute terms. ESG indices and rating agencies are in high demand due to the growing acceptance of ESG investing. ESG index also termed as sustainable index. Investors can use these indices as benchmarks to monitor the performance of their assets (Pagano et al., 2018). These indices support ESG investing and ethical investment practices. Over 100 ESG rating and indexing firms show that ESG index funds are becoming more popular among investors and portfolio managers (Efimova, 2018). There are currently 121 ESG indices available and, more than 700 ESG indexes are managed by Morgan Stanley Capital International (MSCI), a well-known index and ratings organisation. The Dow Jones Sustainability Indices (DJSI), the FTSE4Good indices, the FTSE Russell index, the Thomson Reuters indices, and the S&P Dow Jones and RobecoSAM index are all prominent socially responsible investment indices (Rehman et al., 2021). These keep track of the stock prices of companies that meet ESG criteria. As a result, these indexes are critical in developing responsible behaviours and incorporating sustainable practices into enterprises (Ho, 2013). Individual investors and portfolio managers whose primary goal is financial return use these indexes to source investment and to track the performance (Revelli & Viviani, 2015). Only organisations that exceed their peers in an in-depth review of economic, environmental, and social factors are included on these sustainability indices, which helps investors to evaluate a firm's sustainability performance. As a result, they differ from traditional indices. These indices contain companies that are commonly regarded as sustainability leaders (Miralles-Quiros et al., 2017).

Socially Responsible Indices (SRI) has become a decisive investing criterion all over the world. In the United States and Europe, SRI indices such as the Dow Jones Sustainability Index (DJSI), the FTSE4GOOD index, and

others already exist. However, it is still in its beginnings in India. This began in 2012 when the BSE and IIM Ahmedabad collaborated to establish GREENEX and launched an ESG index that measures the extent to which companies adhere to sustainability principles. In the Indian market, there are now several SRI funds and green bonds (Sharma & Jasuja, 2020). Even though some studies have focused on ESG and SRI, a lack of research has looked at the strength of ESG index integration with conventional equity indices. As the world becomes more globalised, the integration of financial markets marks a step forward in the securities markets. In terms of returns and the examination of relationships within world stock markets, this has sparked the interest of international investors and academic experts. SRI indexes are thought to be less globally integrated than conventional equity indices. Less integrated indices run a high risk of being mispriced from one market to the next. A more connected environment allows for more efficient resource allocation, which leads to more profitable investment opportunities, whereas barriers to this environment reduce efficiency (Ur Rehman et al., 2016).

Our study examines the integration of conventional equity indices and sustainable equity indices in developed and emerging markets, specifically among the United States of America (USA), United Kingdom (UK), China and India. We use data from the MSCI ESG index and MSCI standard indices, which were introduced in 2010. We also examine short-run and long-run trends, evaluating the possibilities for diversification of the portfolio of developing markets. This will assist us in locating evidence to support the common perception that sustainable indexes are not as globally interconnected as conventional equity indices. The indices under the current study are discussed below:

*MSCI USA Index:* The MSCI USA Index is a stock market index that measures the performance of large and mid-cap stocks in the United States. The index covers approximately 85 percent of the free float-adjusted market capitalisation in the USA, with 627 constituents.

*MSCI USA ESG Leaders Index:* The MSCI USA ESG Leaders Index is a capitalisation-weighted index that tracks companies that outperform their industry peers in terms of ESG. Large and mid-cap firms in the USA market cover the MSCI USA ESG Leaders Index.

*MSCI UK Index:* The MSCI UK Index is used to track the performance of the UK market's large and mid-cap categories. The index covers about 85 percent of the free float-adjusted market capitalisation in the UK, with 86 constituents.

*MSCI UK ESG Leaders Index:* The MSCI UK ESG Leaders Index is a capitalisation-weighted index that exposes firms that outperform their sector peers in terms of ESG performance. Large and mid-cap corporations in the UK markets cover the MSCI UK ESG Leaders Index.

*MSCI China Index:* The MSCI China Index includes large and mid-cap stocks from China's A, H, and B, as well as Red Chips, P Chips, and foreign listings categories. The index represents around 85% of the Stock market universe, with 736 constituents. The index currently contains 20 percent of the free float-adjusted market capitalisation of Large Cap A and Mid Cap A equities.

*MSCI China ESG Leaders Index:* The MSCI China ESG Leaders Index is a capitalisation-weighted index that invests in companies that outperform their sector peers in terms of ESG performance. The MSCI China ESG Leaders Index is composed of large and mid-cap Chinese firms.

*MSCI India Index:* The MSCI India Index is meant to track the performance of the Indian market's large and mid-cap categories. The index, which has 101 constituents, represents around 85 percent of the Indian equities' universe.

*MSCI India ESG Leaders Index:* The MSCI India ESG Leaders Index is a capitalisation-weighted index that invests in firms that outperform their sector peers in terms of ESG performance. The MSCI India ESG Leaders Index is constructed of large and mid-cap companies of the Indian capital market.

The present study is organised as follows: the second section reviews prior literature, the third section presents the research methodology, the fourth section elaborates the analysis and results, and the last section concludes the paper.

## 2. LITERATURE REVIEW

The creation of sustainable indices signals a rise in public interest in environmental and socio-economic issues. Return and volatility interrelationship and comparisons between traditional market indices and sustainability indices have been the subject of research. Charlo et al., (2017); Mensi et al., (2017) Examine the risks and rewards of sustainable indexes, as well as their impact on the market as a whole. More research on this topic is

needed to develop it as an applied field of investment. Sustainable investment is a potential solution to social and ecological challenges that transform financial markets into more accountable for its effects. Santis et al., (2016) compared the financial and economic performance of companies in the Corporate Sustainability Index with the conventional Sao Paulo Stock Exchange Index. They found no indication of economic or financial performance disparities between companies from each of the analysed indices. Tripathi & Bhandari, (2014) Using multiple risk-adjusted indicators and conditional volatility measures, compare the performance of BRICS countries' SRI to their respective conventional market indices. India is the highest performer during times of crisis. There is further evidence of outperformance in terms of risk-adjusted returns by SRI indexes of BRICS countries across time. Felipe Arias Fogliano de Souza Cunha & Samanez, (2013) Sustainable index did not achieve satisfactory financial performance during the study period despite having several distinctive features in the Brazilian stock market, such as increased liquidity and minimal diversifiable risk. Tularam et al., (2010) investigated the relationship between the Australian sustainable index market and other sustainable index markets across the world. Using the Dynamic conditional correlation (DCC) method, they found that the Australian market exhibited a rise in correlation with the other markets during instances of market distress. Balcilar et al., (2017) investigates dynamic relations and the potential diversification benefits between conventional and sustainability stock indexes from various geographies. The authors found unidirectional volatility transfers from traditional to sustainable stocks, implying that socially responsible investment rules do not always protect these stocks from market shocks. Ortas et al., (2014) focuses on the FTSE4Good-Ibex in Spain, to see whether ESG screens give ethical investors adaptive resilience in bull and bear market conditions. According to a Multivariate Generalized Autoregressive Conditional Heteroskedasticity (M-GARCH) research, ethical investors in the equity market are more resilient to severe business cycle shocks, which could be attributed to SI by corporations. Sadorsky, (2014) also uses the MGARCH technique to model the volatilities and relation between the SRI, oil price and gold prices. Alshehhi et al., (2018) conducted a content analysis of the literature on the impact of corporate social responsibility (CSR) on financial performance and discovered that 78 percent of the publications found there is a positive association between CSR and financial performance. Batista & de Francisco, (2018) Examine the sustainable practises of companies included on the Corporate Sustainability Index in relation to the Brazilian stock market, and discover that environmental, human resource, and organisational management serve as the foundation for implementing sustainable practises.

Binmahfouz & Kabir Hassan, (2013) Examine the investment characteristics of traditional socially responsible investment portfolios in comparison to their more general counterparts. In comparison to their unconstrained conventional equivalents, neither the Sharia nor the sustainability screening process appears to have an unfavourable impact on investment portfolio performance and systemic risk. Curto & Vital, (2014) examined the daily prices and returns of four traditional and ten sustainable stock indices in bull and bear market with the help of co-integration test and Granger causality test the authors found that sustainable indices outperform traditional stock indexes across all periods. Jawadi et al., (2019) Evaluate uncertainty for three prominent stock indexes, the Dow Jones Industrial Index, Dow Jones Islamic Index, and Dow Jones Sustainability Index, for 1999–2017 using the Generalised Autoregressive Conditional Heteroscedasticity (GARCH) modelling. The findings reveal that conventional and ethical investments both have significant levels of uncertainty. Erragragui et al., (2018) evaluates the robustness of Islamic and SRI indexes in five developed US, UK, Japan, Canada, Australia and three emerging Brazil, India, South Africa economies. Sherwood & Pollard, (2018) suggest that including ESG emerging market stocks in institutional portfolios could deliver higher returns and lower risk than non-ESG equity investments. However, this suggestion contradicted (Mynhardt et al., 2017) that traditional market indices are more efficient than SRI in emerging markets. Jain et al., (2019) used Granger's causality model and GARCH type modelling to determine the linkage between the ESG indices and MSCI indices of emerging and developed markets. Johansen's co-integration test and the Vector Error Correction Model (VECM) to test the volatility spillover between the sustainable and conventional indices. The study discovers that sustainable and conventional indexes are interconnected. Rehman et al., (2021) investigated the integration of BRICS nation's conventional indices and ESG indices. MSCI ESG and MSCI composite indices were analyzed using Johansen's co-integration test, followed by VECM to test causality among the indices. Impulse Response Function (IRF) and Variance Decomposition Analysis (VDC) were also applied to analyse each country's responses and impact. As per findings, all ESG equity indexes appear to be integrated with conventional indices in all BRICS nations. In addition, the MSCI ESG and MSCI composite equity indices of China and South Africa have a short- or long-run causal relationship. But only long run causality between the India's conventional and ESG indices.

Sharma & Jasuja, (2020) compares the performance and volatility of BSE Greenex and BSE Carbonex vs BSE Sensex in terms of risk and return for the period 2012-2020 and discovered that Sensex provided the highest

returns over the study period compared to the other two sustainability indices, Greenex and Carbonex. However, it is also discovered that Carbonex outperforms Greenex significantly. Patel & Kumari, (2020) Attempts to understand how sustainability indexes behave in comparison to market indices. The study compares the performance of the BSE Carbonex and BSE Greenex, BSE Sensex, and BSE 500. According to the research, the Carbonex performs similarly to the BSE Sensex and BSE 500. The performance of the Greenex index is marginally lower than that of the BSE Sensex and the BSE 500. However, Singh, (2013) found that during the financial crises ESG index was not performed well. Sudha, (2015) using GARCH indicates that the ESG India Index's daily compounded returns are not statistically different from the Nifty or the CNX 500; the ESG India Index's annualised returns have outperformed the other two indexes. As a result, focusing on environmental and social sustainability benefits businesses, investors, and society as a whole.

Several studies evaluated different sustainable indices of developed markets and BRICS countries, but no studies examine the integration of SI and conventional indices of developed and emerging markets. So, a greater understanding of the integration of ESG equity indices and traditional indices in developed (USA and UK) and emerging markets (China and India) is required.

### **3. OBJECTIVES**

Our research is unique in that it explores this generally overlooked section of the literature regarding sustainability investing and the co-integration of sustainable equity indices with conventional stock indices within developed (USA and UK) and emerging markets (China and India). So, the objectives of current studies are stated as follows:

1. To investigate the long-run relationship among the sustainable equity indices with conventional stock indices of the USA, UK, China and India
2. To investigate the short-run causal relationship among the sustainable equity indices with conventional stock indices of the USA, UK, China and India

### **4. RESEARCH DESIGN**

#### **4.1 Data Description**

Our work is on the integration of sustainable and conventional indices in developed and emerging markets. Daily data of MSCI USA Index (USA STD), MSCI USA ESG Leaders Index (USA ESG), MSCI UK Index (UK STD), MSCI UK ESG Leaders Index (UK ESG), MSCI China Index (China STD), MSCI China ESG Leaders Index (China ESG), MSCI India Index (India STD), MSCI India ESG Leaders Index (India ESG) are collected from the websites of MSCI from the period of ten years ranging from 1<sup>st</sup> August 2011 to 31<sup>st</sup> July 2021. The USD is the quoted currency in these indices. This helps to avoid local inflationary pressures and currency swings on the indices. To obtain more robust t-statistics, all series are changed to natural log (Gujarati, 2004).

#### **4.2 Unit root test and Lag length selection**

Ordinary regression on non-stationary variables will produce erroneous findings since statistical tests like t-statistics and F statistics are not statistically valid. The differenced form makes the stationary of variables, but regression analysis on the differenced variable eliminates the long-term trend and the theoretical component of the estimation. The variables must be non-stationary in order for the co-integration test to be valid (Mohammad Ashraf Ferdous and Masih, 2015). Before analyzing the integration among the indices, we applied two unit root tests Augmented Dickey-Fuller test (ADF test) (Dickey and Fuller, 1979), the Phillips-Perron test (PP test) (Phillips and Perron, 1988), to check the non-stationary properties of the series. The treatment of any serial correlation in the series is the main difference between the two unit root tests. The PP test is more resistant to serial correlations and time-dependent heteroskedasticity than other tests (Chen et al., 2009). The Akaike information criterion (AIC) was used to choose the lag length for further investigation.

#### **4.3 Johansen's Cointegration Test**

The paper uses Johansen's co-integration analysis on the time series in consideration to see if they are co-integrated. This test also allows to establish co-integration between sustainable indices and conventional market indices of developed and emerging markets. The absolute series, which is non-stationary, is used for the co-integration test. If the series under investigation turn out to be integrated of the same order, the integrated variables can be tested for co-integration (Madhusoodanan & Kumar, 2008). The approach devised by Johansen (1988) and Johansen and Juselius (1990) is used to perform co-integration tests. The Johansen technique uses the maximum likelihood approach to determine the presence of co-integrating vectors in non-stationary time series (Johansen & Juselius, 1990).

$$\Delta X_t = c + \sum_{i=1}^{n-1} \Gamma_i \Delta X_{t-i} + \Pi X_{t-n} + \varepsilon_t \tag{1}$$

Where  $X_t$  is a vector of non-stationary variable,  $c$  is the constant and  $n$  is the lag length based on AIC,  $\Delta$  is the difference operator,  $\Pi$  and  $\Gamma$  is the matrix of parameters to be estimated, and  $\varepsilon_t$  is the error term. The  $\Pi$  determines the long-run relationship indicating  $\alpha$  and  $\beta$  contain adjustments and co-integrating vectors (Kumar Soni, 2014). Johansen’s co-integration test is based on two test statistics. They are trace tests and maximum eigenvalue tests.

$$\lambda_{traces} = -T \sum_{i=r+1}^n \ln(1 - \lambda_i) \tag{2}$$

$$\lambda_{max} = -T \ln(1 - \lambda_{r+1}) \tag{3}$$

The null hypothesis in the trace test is that the number of different co-integrating vectors is less or equal to the number of co-integration relations ( $r$ ). The maximum value test examines the null hypothesis of exactly  $r$  co-integration relation with the alternative of  $r + 1$  co-integration relation (Kishor & Singh, 2016).

**4.4 VAR Granger Causality test**

Methods of conducting causation tests or, more precisely, Granger causal tests can be considered for the VAR. It will be applied to the stationary series. The first differences in the index series are therefore applied (Rajkumar, 2015). Thus, the Granger Causality Test analyses the cause and direction of causality between the developed and emerging markets indices. According to Granger (1969), the test answers the question of whether the  $Y$  series causes another  $X$  series. To test the causality, the following models are specified:

$$\Delta Y_t = \phi_y + \sum_{j=1}^n \gamma_{y,j} \Delta Y_{t-j} + \sum_{j=1}^n \beta_{y,j} \Delta X_{t-j} + \phi_y ECT_{y,t-j} + \varepsilon_{yt} \tag{4}$$

$$\Delta X_t = \phi_x + \sum_{j=1}^n \gamma_{x,j} \Delta X_{t-j} + \sum_{j=1}^n \beta_{x,j} \Delta Y_{t-j} + \phi_x ECT_{x,t-j} + \varepsilon_{xt} \tag{5}$$

Where  $\varepsilon_{yt}$  and  $\varepsilon_{xt}$  are the random error terms and  $n$  is the maximum number of lags.  $\gamma_j$  and  $\beta_j$  are parameters,  $\phi_y$  and  $\phi_x$  are constants.

**4.5 Impulse Response Function**

VAR Granger cannot identify the exact depth of feedback between one variable and another variable. So, Shan, (2005) introduced IRF in order to resolve this problem. An IRF can be explained in very simple terms as a method used to examine the path of a variable after a shock. A shock transmission could be monitored using an IRF to properly evaluate a variable's behaviour (Victor et al., 2021). Since the error term or innovations are generally correlated, therefore share some common factors. We use the Cholesky ordering to capture the impulse and response variables. The IRF graphically shows each index expected response to shocks to itself and the other indices. This feature allows the dynamic interactions between variables to be characterised, and the speed of system adjustments can be observed (Madhusoodanan & Kumar, 2008).

**5. RESULTS AND DISCUSSION**

**5.1 Descriptive Statistics**

In order to obtain comparative insights on the sustainability indices and conventional indices, this paper computes descriptive statistics presented in table 1, i.e., the mean, medians, minimum, maximum, standard deviation, the skewness, and kurtosis to understand the behaviour of the series, as well as the p-value of Jarque-Bera statistics to check the normality of the series. It can be seen from the results that mean, and median all the series are closer to each other except sustainable index of USA and conventional index of China. Both sustainable and conventional indices of the UK exhibits the lowest variation followed by India, while the sustainable index of China exhibits the highest variation followed by the USA. Conventional indexes of the USA and UK are negatively skewed, having a long-left tail, but all other indices are positively skewed. The kurtosis value of all indices except the conventional index of the UK is lower than the threshold value of three, implying the series are lower peaked i.e., platykurtic. The probability value of Jarque-Bera indicates that all indices are not normally distributed except the sustainable index of the UK, which is normally distributed.

**Table 1. Descriptive Statistics of Sustainable and Conventional Indices**

Descriptive Statistics	LOGUSA_ STD	LOGUSA_ ESG	LOGUK_ STD	LOGUK_ ESG	LOGCHI NA_ STD	LOGCHI NA_ ESG	LOGINDIA_ STD	LOGINDI A_ ESG
Mean	7.658753	4.823881	7.041987	6.563482	4.254919	7.118522	6.205503	7.197268
Median	7.619957	4.781968	7.045510	6.547067	4.195019	7.075153	6.206190	7.190093
Maximum	8.367783	5.518882	7.277461	6.800440	4.864414	7.948531	6.654471	7.772643
Minimum	6.955305	4.158133	6.527790	6.082070	3.795175	6.425515	5.757058	6.714879
Std. Dev.	0.320118	0.305265	0.108688	0.112969	0.215003	0.349882	0.177469	0.248944
Skewness	-0.001383	0.027778	-0.562947	0.098364	0.572189	0.286477	0.174215	0.144633
Kurtosis	2.406375	2.475915	4.064805	2.971017	2.439813	2.115081	2.528869	2.351103
Jarque-Bera	38.32327	30.20546	261.1574	4.300209	176.5459	120.8600	37.34123	54.89067
Probability	0.000000	0.000000	0.000000	0.116472	0.000000	0.000000	0.000000	0.000000
Observations	2610	2610	2610	2610	2610	2610	2610	2610

Source: Author’s calculation

**5.2 Unit root tests results and lag selection**

The unit root tests of all time series are reported in table 2. Test statistics of both ADF and PP test for unit root test indicates that all series are non-stationary at level. However, the hypothesis of the unit root is strongly rejected in their first differenced form in all series. So, we conclude that the series under consideration are integrated at the order I (1). This means that all indices are integrated individually so indices are efficient and information is effectively disseminated. The optimal lag is selected based on AIC criteria. Selection of lags tests showing that six lags as the optimal lag.

**Table 2. Unit Root Test**

Sectoral Index	Augmented Dickey-Fuller (ADF)		Phillips-Perron (PP)	
	At Level	At First Difference	At Level	At First Difference
LOGUSA_STD	-0.2394 (0.9310)	-11.7179*** (0.0000)	-0.0504 (0.9527)	-60.0032*** (0.0001)
LOGUSA_ESG	-0.1370 (0.9436)	-11.8786*** (0.0000)	0.0357 (0.9606)	-60.4741*** (0.0001)
LOGUK_STD	-2.4544 (0.1270)	-11.6658*** (0.0000)	-2.7827* (0.0609)	-50.1043*** (0.0001)
LOGUK_ESG	-2.1752 (0.2156)	-12.0416*** (0.0000)	-2.5610 (0.1014)	-49.5427*** (0.0001)
LOGCHINA_STD	-1.4797 (0.5440)	-19.4086*** (0.0000)	-1.3630 (0.6019)	-47.5587*** (0.0001)
LOGCHINA_ESG	-0.9042 (0.7874)	-30.4143*** (0.0000)	-0.8652 (0.7995)	-49.4979*** (0.0001)
LOGINDIA_STD	-1.4929 (0.5373)	-15.4694*** (0.0000)	-1.2702 (0.6455)	-50.7864*** (0.0001)
LOGINDIA_ESG	-0.8133 (0.8148)	-15.8516*** (0.0000)	-0.4803 (0.8926)	-51.7054*** (0.0001)

a: (\*)Significant at the 10%; (\*\*)Significant at the 5%; (\*\*\*) Significant at the 1%

Source: Author’s calculation

**5.3 Johansen’s Co-integration Test Results**

Since the differenced series are stationary, the paper employs Johansen’s co-integration test to check their long-run co-integration. Table 3 presents the test statistics and critical value of the co-integration test. The critical value of the trace test and maximum eigenvalue test is greater than the corresponding trace statistics and Max-Eigen Statistic indicating to accept the null hypothesis of no co-integrating equation. The results imply no long-run relationship between the conventional indices and sustainable indices of developed and emerging markets. To further explain the short-run causality relationship VAR Granger causality test is performed.

**Table 3 Johansen's co-integration results (Trace test and Maximum Eigen Value)**

Hypothesised No. of CE(s)	Unrestricted Cointegration Rank Test (Trace)				Unrestricted Cointegration Rank Test (Maximum Eigenvalue)			
	Eigen	Trace	Critical	Prob.**	Eigen	Max-	Critical	Prob.**

	value	Statistic	Value at 0.05		value	Eigen Statistic	Value at 0.05	
None *	0.0181	140.0611	187.4701	0.9166	0.0181	47.5928	56.7051	0.2996
At most 1	0.0094	92.4682	150.5585	0.9975	0.0094	24.7312	50.5998	0.9970
At most 2	0.0084	67.7370	117.7082	0.9971	0.0084	22.1538	44.4972	0.9866
At most 3	0.0050	45.5831	88.8038	0.9980	0.0050	13.1443	38.3310	0.9999
At most 4	0.0044	32.4388	63.8761	0.9851	0.0044	11.5493	32.1183	0.9971
At most 5	0.0039	20.8895	42.9152	0.9422	0.0039	10.3134	25.8232	0.9532
At most 6	0.0023	10.5760	25.8721	0.8981	0.0023	5.9964	19.3870	0.9560
At most 7	0.0017	4.5796	12.5179	0.6574	0.0017	4.5796	12.5179	0.6574

Trace test and Max-eigen value test indicates no co-integrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Source: Author’s calculation

5.4 VAR Granger Causality Test

The short-term causal effect was assessed using the Granger causality test after no evidence of a long-run relationship between the variables. Log differenced variables are considered to fulfil the precondition of the Granger causality test. The results presented in table 4 exhibited that the conventional index of the USA granger causes both conventional and sustainable indices of China and India but not vice versa. However, the USA’s conventional and sustainable indices are only caused by the UK’s conventional and sustainable. But UK’s indices are not caused by any of the indices. Both indices of India are caused by conventional and sustainable indices of the UK and sustainable indices of the USA. While the conventional index of India is only caused by its sustainable index.

Table 4 Granger Causality Test Results

Dependent	Independent							
	Wald $\chi^2$ Statistics							
	$\Delta$ LOGUSA_S TD	$\Delta$ LOGUSA_E SG	$\Delta$ LOGUK_ STD	$\Delta$ LOGUK_ ESG	$\Delta$ LOGCHIN A_STD	$\Delta$ LOGCHI NA_ESG	$\Delta$ LOGINDI A_STD	$\Delta$ LOGINDI A_ESG
$\Delta$ LOGUSA_STD	-	7.9935 (0.2386)	30.8213*** (0.0000)	31.3490*** (0.0000)	7.8783 (0.2472)	6.8863 (0.3315)	1.5573 (0.9556)	4.7945 (0.5704)
$\Delta$ LOGUSA_ESG	5.4941 (0.4822)	-	32.2790*** (0.0000)	31.8870*** (0.0000)	7.5924 (0.2695)	6.6057 (0.3589)	1.6532 (0.9487)	5.1791 (0.5211)
$\Delta$ LOGUK_STD	4.8400 (0.5645)	9.3349 (0.1556)	-	9.7038 (0.1377)	6.6250 (0.3569)	10.5576 (0.1030)	3.6260 (0.7271)	3.0357 (0.8044)
$\Delta$ LOGUK_ESG	5.4695 (0.4851)	8.9905 (0.1741)	8.1866 (0.2247)	-	4.1180 (0.6607)	7.3101 (0.2931)	4.5251 (0.6060)	4.0009 (0.6766)
$\Delta$ LOGCHINA_ST D	15.3755** (0.0175)	9.3205 (0.1563)	4.4592 (0.6148)	7.8345 (0.2505)	-	9.8434 (0.1314)	6.0544 (0.4171)	7.7960 (0.2534)
$\Delta$ LOGCHINA_ES G	20.3769*** (0.0024)	12.4310* (0.0530)	7.8813 (0.2469)	11.1555* (0.0837)	12.3835* (0.0539)	-	8.0865 (0.2318)	10.1111 (0.1201)
$\Delta$ LOGINDIA_ST D	12.7554** (0.0471)	16.2747** (0.0124)	17.0049*** (0.0093)	15.8151** (0.0143)	5.3589 (0.4987)	7.2340 (0.2997)	-	17.0581*** (0.0091)
$\Delta$ LOGINDIA_ES G	14.4982** (0.0245)	18.2446*** (0.0056)	182631*** (0.0056)	17.3640*** (0.0080)	5.1113 (0.5296)	6.6708 (0.3524)	8.2863 (0.2179)	-

a: (\*)Significant at the 10%; (\*\*)Significant at the 5%; (\*\*\*) Significant at the 1%

Source: Author’s calculation

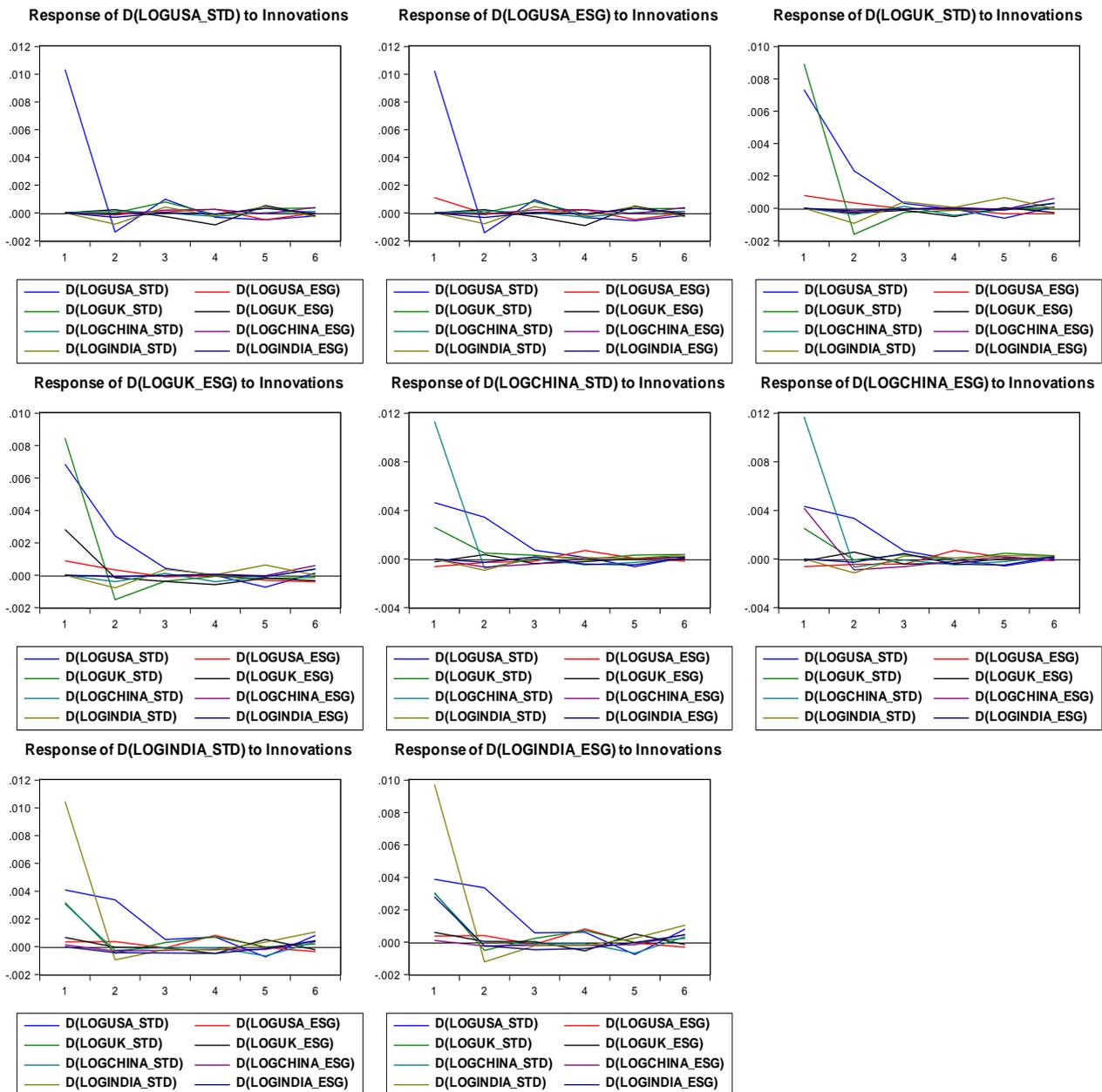
5.5 Impulse Response Function Results

This study also employs impulse response to determine the impact of one variable's shock on other variables, their degree of response, and the time it would take to normalise. The IRF is shown in Figure 1. The expected response of each index to shocks to itself and shocks in other indices is represented visually by IRF. From the

graph plot, it can be evident that all the indices of other countries, whether its conventional or sustainable index, started responding positively to one standard deviation shock given to the conventional index of the USA during the first three periods and in the subsequent period, it fades away. One standard shock given to both conventional or sustainable index of UK, started with a positive response by both conventional or sustainable index of India, however no significant response of any indices to the shocks given to both conventional or sustainable index of India. However, it can be seen that the conventional index of India reacts positively to the shocks given to the sustainable index of India. There is a significant response of all indices to the shocks given to their own lagged values.

Figure 1 Impulse Response Function

Response to Cholesky One S.D. (d.f. adjusted) Innovations



6. CONCLUSION

Environmental, social, and governance equity indices are becoming increasingly popular among investors engaged in long-term investment. ESG equity indices require companies to demonstrate superior sustainability performance and beat their counterparts in a thorough examination of economics, the environment, and social factors. These companies are regarded as sustainability leaders as a result of their efforts. We explore the integration of the newly formed MSCI ESG equity indices in the developed (USA and UK) and emerging markets (China and India) with their equivalent MSCI standard equity indices in the same countries. ADF and PP unit root tests indicate that all the time series are stationary at the first difference. The Johansen co-

integration test reveals no long-run integration between the conventional and sustainable indices of the developed and emerging markets. However, the Granger causality test indicates short causality among the indices indicating the flow of information among the countries in the short run. There is no bi-directional causality found among the indices. Further, IRF shows consistent results with the Granger causality test. Both conventional and sustainable index of India is most influenced by the indices of the USA and UK. However, the indices of the UK are the least influenced one, followed by the USA.

Our findings suggest that sustainable equity indices in the countries have not fully matured to the point where they can demonstrate long-term integration with conventional equity indices. As a result, these sustainable equity indices must be promoted further to become completely incorporated into these countries' financial systems. Arbitrage prospects would be minimal if the markets were integrated. The lack of arbitrage opportunities may result in a low level of speculation, which would benefit small investors. Financial managers and professionals are invited to learn more about investment decisions. The study also advises that their portfolios should include both indexes for risk diversification and hedging and enjoy the profits of both.

Additionally, the government may utilise such data to develop public policies, and civil society organisations may use it to monitor and regulate a company's social and environmental responsibilities. The scope of the studies is limited to four countries' MSCI index data. Further studies may investigate the long-run relationship among conventional indices and sustainable indices of the India and other developed countries.

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**A REVIEW ON IMPORTANCE OF NEW PRODUCT DEVELOPMENT IN MARKETING PROGRAM, FOCUSING ON CAPITAL GOODS**

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**J. Phani Krishna<sup>1</sup> and Dr. Ashok Kumar Katta<sup>2</sup>**<sup>1</sup>PhD Research Scholar, Department of Management Studies, VELS Institute of Science, Technology and Advanced Studies (VISTAS), Chennai<sup>2</sup>Associate Professor & Research Supervisor, School of Management Studies, VELS Institute of Science, Technology and Advanced Studies (VISTAS), Chennai

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**ABSTRACT**

*New product development (NPD) is the process of bringing a new product to the marketplace. Your business may need to engage in this process due to changes in consumer preferences, increasing competition and advances in technology or to capitalise on a new opportunity.*

*Successful new product development is a critical cornerstone of firm success. Significant incentives exist for firms to continuously introduce viable new products to the markets they serve. The financial payoff from successful new product introductions can help many firms overcome the slowing growth and profitability of existing products and services that are approaching the maturity stages of their life cycles.*

*Innovative businesses thrive by understanding what their market wants, making smart product improvements, and developing new products that meet and exceed their customers' expectations. Firms that have multiple successful products in their portfolios can command greater attention and priority treatment, such as preferred space and payment terms, from various vertical buyers.*

*The paper summarizes NPD success factors, suggests metrics that should be used to measure these factors, and proposes minimum evaluation tools and techniques to make use of these metrics in a modified popular BAH model. However, the modified model can be reworded and can be deployed in many firms that are in capital goods context.*

*Key words: Consumer behavior, Capital goods, BAH Model, NPD, Market Management*

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**PREFACE:**

With a well-considered new product development (NPD) strategy, firm can avoid wasting time, money and business resources. An NPD strategy will help firms to organise product planning and research, capture respective customers' views and expectations, and accurately plan and resource firm's NPD project. Decent strategy will also help you avoid:

- overestimating and misreading your target market
- launching a poorly designed product, or a product that doesn't meet the needs of intended target customers
- incorrectly pricing products
- spending resources one don't have on higher-than-anticipated development costs
- exposing firm's business to risks and threats from unexpected competition.

**Problem Definition:**

Without a good NPD process firms cannot efficiently manage the inherent risk of new product development. However, even a good NPD process is inherently complex to manage. A significant measure of complexity results from the fact that communications and information management technologies now allow, and even encourage, the process to be rightfully dispersed – both organizationally as well as geographically.

The study of measuring the success factors in each phase and framework to measure the success factors is vital. The tools required to evaluate these measured values are equally important.

**Objectives of Research:**

Identify the defining stages in NPD w.r.t capital goods and narrow down to promulgate success factors for each stage and create a template to measure the success factors. List the minimum tools required to evaluate these measured values specifically to Capital Goods environment.

**Scope of Research:**

A key factor in successfully managing the complexities of new product development in any organization is having a clear understanding of the process. Capital goods include buildings, machinery, equipment, vehicles,

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and tools. Capital goods are not finished goods instead part of a system, but they are used to make finished goods or process systems. These are physical assets that a company uses in the different processes to produce products and provide services that consumers will later use.

Current scope of research surrounds in the industrial verticals where the NPD focussed on innovation and developing new products that are necessary to compete in dynamic markets focussing on capital goods. Various stages are detailed and metrics for measuring are categorically mentioned. Tools to evaluation are generalized that can be future study. Commercialization is beyond scope of work.

### **Theoretical Framework:**

The NPD process, four elements of the environment can be delineated to be more important – and these are customers, technology, competitors and suppliers. To be successful NPD team actions should be sensitive to the needs of customers, and to competitors, technology, and suppliers. New product development cannot be managed successfully without a clear understanding of customers and their changing needs.

Organizationally, the NPD process operates best when it can capitalize on key inputs from multiple functional areas within the firm, including marketing, engineering, production, finance, etc. In general, no single organizational unit optimally represents at the same time the voice of the customer, as well as all the technical, operational, and financial competences of the firm. The interactions between multiple organizational units are instrumental in influencing the efficacy of the NPD process and, in turn, the likelihood of introducing commercially viable products. The process clearly benefits from inputs gathered from sources outside of the organization – from key customers, from important competitors, and from strategic partners such as the firm's principal suppliers

### **Identify key issues and approaches**



There are many tasks involved in developing a product that is appropriate for your customers. The nature of your business and your idea will determine how many of these steps you need to take. You may be able to skip or duplicate certain stages or start some of them simultaneously. Key tasks include:

- generating and screening ideas
- developing and screening concepts
- testing concepts
- analyzing market and business strategy
- developing and market testing products
- implementing and commercializing products.

Several detailed NPD models have been developed over the years, the best known of which is the Booz, Allen and Hamilton (1982) model, shown in Figure 1, also known as the BAH model, which underlies most other NPD systems that have been put forward. This widely recognized model appears to encompass all the basic stages of models found in the literature. It is based on extensive surveys, in depth interviews, and case studies and, as such, appears to be a good representation of prevailing practices in industry.

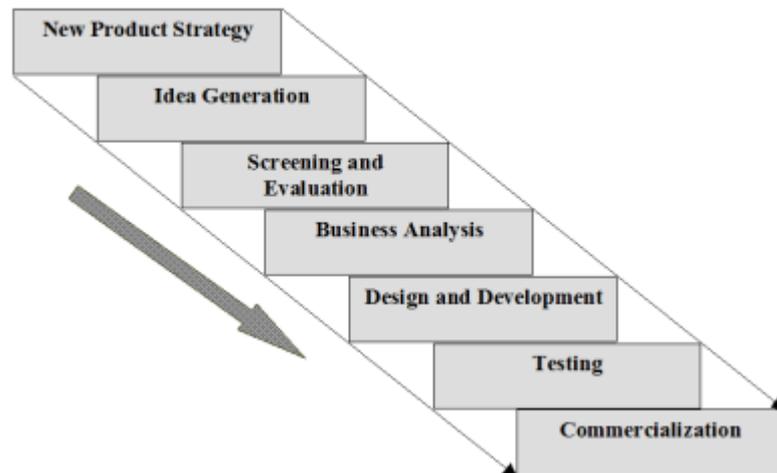


Figure 1. Stages of New Product Development (NPD) (Booz, Allen & Hamilton, 1982)



The stages of the model are as follows:

- New Product Strategy: Links the NPD process to company objectives and provides focus for idea/concept generation and guidelines for establishing screening criteria.
- Idea generation: Searches for product ideas that meet company objectives.
- Screening: Comprises of an initial analysis to determine which ideas are pertinent and merit more detailed study.
- Business Analysis: Further evaluates the ideas based on quantitative factors, such as profits, Return-on-investment (ROI), and sales volume.
- Development: Turns an idea on paper into a product that is demonstrable and producible.

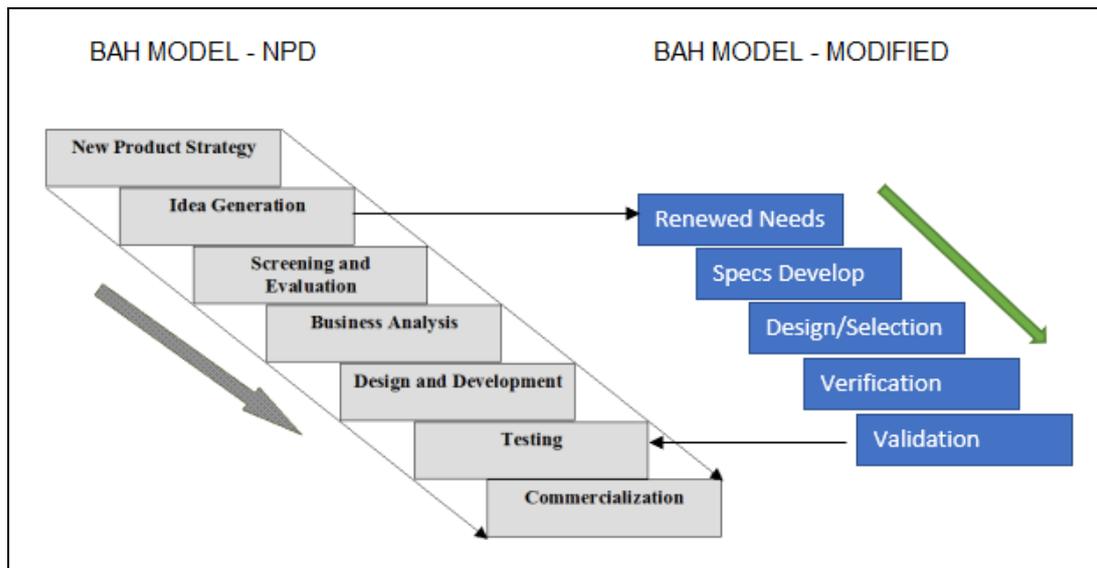
- Testing: Conducts commercial experiments necessary to verify earlier business judgments.
- Commercialization: Launches products.

A not-so-deviation from the BAH model, adopted to capital goods from a continuous production firm will improve the results of objectives.

The NPD works on improvements to existing models or adding additional features inline with updating in technology, availability of materials etc to meets renewed requirements. The modified BAH model in Figure 2, is reliable for the renovation and extending the existing core designs but with modified accessories to suit the renewed needs.

The stages of the BAH modified model are as follows:

- New Product Strategy: Links the NPD process to company objectives and provides focus for idea/concept generation and guidelines for establishing screening criteria.
- Renewed Needs: Reviews the existing designs and possible modifications that can improve market penetrations.
- Specifications Develop: Renewed needs translates by exploring to improve specifications and new technologies that are commercially available and feasible.
- Design and Selections: Transform concept into preliminary technical product, Perform Design Review (Intermediate), Update verification & Validation Plan
- Verification and Validation: Verify the design, Complete the design & ready for Validation, Finalise on drawings & specifications (release for Prototype), Ensure performance (Factory Test)



**Figure 2 Modified BAH model**

Modified BAH model originates from the existing designs and tuned them for meeting renewed needs at buyers’ requirements. Given that this is now a well-known fact, the idea is to determine what factors in NPD are essential for success, and how to measure the extent of this success. The challenge is to design a process for successful product innovation - a process whereby new product projects can move quickly and effectively from the idea stage to a successful launch and beyond.

A metric tracks performance and allows a firm to measure the impact of process improvement over time. Metrics can play an important role in helping companies to enhance their NPD efforts and are important for at least three reasons.

First, metrics document the value of NPD and are used to justify investments in this fundamental, long term, and risky venture.

Second, good metrics enable decision makers to evaluate people, objectives, programs, and projects to allocate resources effectively.

Third, metrics affect behavior. When NPD team members are evaluated on specific metrics, they often make decisions, take actions, and otherwise alter their behavior to improve the metrics.

Metrics and Evaluation Tools over BAH model modified:

<b>BAH Model-Modified</b>	<b>Metrics</b>	<b>Evaluation tools</b>
Renewed Needs	Modified designs-Sales inputs Program management Existing operational data	Financial analysis Business plans
Specifications Develop	Vendor’s development Design tools	Commercially viability
Design and Selections	Design reviews Appropriation and decisions Degree of functional integration	Prototype test feedbacks Documented Lessons
Verification and Validation	Different materials/options	Lab trials tests Customer involvement Scaled models Customer-Perceived Value

The right metrics align employees' goals with those of the corporation; wrong metrics are counterproductive and lead to narrow, short-term, risk-avoiding decisions and actions. If companies had reliable metrics to gauge their performance, then specific problem areas could be addressed, and managers might see the same improvement in their NPD efforts that they come to expect from their quantifiable total quality management programs.

**DISCUSSIONS AND CONCLUSIONS:**

New product success remains the uphill challenge for many firms. This framework proposes that to achieve success, NPD firms should have a clear and well communicated new product strategy. Firms should have well defined new product arenas along with long term trust, with clear goals. Successful businesses and teams of NPD have a dedication towards the voice of the customer. It is critical that firm should gather as many ideas as possible and many these should come from customers so that the firm can be able to design and develop winning new products. Up-front homework prior to the initiation of product design and development is found to be a key factor in a firm’s success. Firms should try to shorten the development time to minimize the chances that the development and customer needs have changed when the product comes into the market. It is important to verify and validate product performance requirements and design specifications along with customer’s acceptance before launching the product into the market via validation and user field testing.

This paper explored and analyzed the NPD process from prominent BAH model to modified model in capital goods context and attempted to identify ways in which firms can improve their performance when developing new products, mainly through the study of factors that are critical to success. The evaluation tools are important and handy in evaluation the performance of NPD process that are commonly missed to documented whereas it is essential. These are necessary for firms to review the direction in which product strategy originally envisaged is going in right track or not.

However, the modified model will be useful for many firms in capital goods market segment for improving their market promotion and penetration in existing markets.

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**THE INHERENT REFLECTION OF DISPLACEMENT AND NOSTALGIA IN AFTERNOON RAAG AND A NEW WORLD- A POSTCOLONIAL PERSPECTIVE**

**T. Jasmine Shalini Ebeneser<sup>1</sup> and Dr. S. Felicia Gladys Sathiadevi<sup>2</sup>**

<sup>1</sup>Research Scholar (Part Time), Department of English, Sarah Tucker College, Tirunelveli

<sup>2</sup>Head & Research Supervisor, Department of English, Sarah Tucker College, Tirunelveli

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**ABSTRACT**

*Indian English fiction has witnessed a remarkable change in the last three decades. A good number of new novelists, hailed from multiple professions, produced a good body of literature with their solid contribution. They have presented the problems of own professions, keeping their region and culture as background, besides highlighting social problems. They are primarily the victims of nostalgia who never forgot and ran away from their roots, region, and culture. Outstanding among the novelists of new generation is Amit Chaudhuri, a young, delightful, and brilliant contemporary writer. This research paper focuses on Chaudhuri's recreation of the state of a young man coming to terms with loneliness, reminiscence, and hostility. And also how the author puts forth his conflicts at various levels namely remembering the music teacher, explaining the ragas, the narrator's choice between India and Oxford, his nostalgic desire for India. In A New World he captures the essence of life in upper-class Calcutta society, its nostalgia.*

*Key words: nostalgia, music, domesticity, loneliness*

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Postcolonial theory is a body of thought primarily concerned with accounting for the political, aesthetic, economic, historical, and social impact of European colonial rule around the world in the 18th through the 20th century. Postcolonial theory takes many different shapes and interventions, but all share a fundamental claim: that the world we inhabit is impossible to understand except in relationship to the history of imperialism and colonial rule. This means that it is impossible to conceive of "European philosophy," "European literature," or "European history" as existing in the absence of Europe's colonial encounters and oppression around the world. It also suggests that colonized world stands at the forgotten center of global modernity. The prefix "post" of "postcolonial theory" has been rigorously debated, but it has never implied that colonialism has ended; indeed, much of postcolonial theory is concerned with the lingering forms of colonial authority after the formal end of Empire. Other forms of postcolonial theory are openly endeavoring to imagine a world *after* colonialism, but one which has yet to come into existence.

Postcolonial theory holds that decolonized people develop a postcolonial identity that is based on cultural interactions between different identities (cultural, national, and ethnic as well as gender and class based) which are assigned varying degrees of social power by the colonial society. In postcolonial literature the anti-conquest narrative analyzes the identity politics that are the social and cultural perspectives of the subaltern colonial subjects—their creative resistance to the culture of the colonizer; how such cultural resistance complicated the establishment of a colonial society; how the colonizers developed their postcolonial identity; and how neocolonialism actively employs the 'us-and-them' binary social relation to view the non-Western world as inhabited by 'the other'.

Amit Chaudhuri was born in Calcutta and raised in Bombay, then sent to England for his university and postgraduate education, it is hardly surprising that so many of the characters in his fiction feel like outsiders in the place where they happen to reside. During his summer visits to relatives in Calcutta, Chaudhuri became aware of the subtle cultural differences even between two cities in the same country.

In *Afternoon Raag* (1993), Chaudhuri describes how even the most minor details remind him that he is far from home. The central character in this novel is a man from Bombay who is completing his education at Oxford University. Unsuccessful in his attempts to reach out to English students, he turns for solace to two Indian women. However, much of the time he simply retreats into memory, imagining himself in his own familiar room in Bombay.

It is about the life and emotions of an Indian student and three 'Asian friends' at Oxford University. The story moves back and forth between Oxford, where the student studies and Bombay, where his parents live. The novel deals with the experiences and impressions of the student who studies English literature at the University of Oxford. Sharma, the student often returns in his thoughts to his domestic life home in Bombay and later to Calcutta. He straddles the two worlds literally – on his trips back and forth – and more importantly imaginatively. The new surroundings of the Oxford Campus, as well as the house in Bombay to which the narrator's parents have moved, prompt a range of sensual reaction. Thus, his sojourn at the university, and his

childhood memories of Bombay and Calcutta form the staple of the book. The novel is titled as *Afternoon Raag*, the 'raag' means a piece of classical Indian music. Chaudhuri calls a 'raga,' "the melodic progression of the ordered and systematized notes of a melody." (4). Here, afternoon 'raag' is played just before the evening and the whole novel gradually unfolds the narrator's love for music and his love for the two girls, Shehnaz and Mandira. Shehnaz, thin, small-breasted, vegetarian postgraduate, is divorced and the student of Oxford University. She meets Sharma when she is at the end of an affair. Mandira, an undergraduate, is depressive, avoids taking her exams, moves off campus, works part-time in the covered market. But eventually takes her exams, and returns home to her family, possibly for an arranged marriage.

Sharma, is not like many Indians who go to Oxford and change their style of living. He has generous openness and is adept at picking English customs and making English friends. He doesn't let down that he feels homesick or separated. The narrator is fond of Sharma's company but he does not allow him to disrupt his world of wistful longing, loneliness, and laughter.

From Said in order to capture the nuances of the particular kinds of estrangement and displacements that were created by nationalist movements. As Said suggests, the movements that sought independence from the colonial powers were not wholly representative of the minority ethnic groups in their territories. Here, Said gestures to the movements and migrations of people from their homelands as a central historical fact of colonization which introduced dramatic changes in the composition of 'Third World' societies. Movements and migrations have always taken place throughout history. These pre colonial migrations did not give rise to the creation of racial, religious, cultural and political divisions that were imposed by imperialism. While these divisions were enforced ostensibly for the purposes of administration, the category of 'ethnicity' especially became a colonial strategy to divide and contain the colonized. This is where the exclusionary underpinnings of nationalism lie.

Amit Chaudhuri establishes his conflicts in *Afternoon Raag* by making his protagonist or the author persona to venerate his music teacher Pandit Govind Prasad Jaipurwale. Yet he gives a detailed description of life in Oxford and India. Though the music teacher is remembered, various ragas and the narrator's friends Sharma, Shehnaz and Mandira and his association with them occupy most chapters of the novel. The bulk of the space and time in the novel is occupied by Oxford. Outwardly the form of this novel looks like that of the 'Tanpura' bought by the narrator... Oxford forms the urn and India – Bombay, Calcutta a bit by Rajasthan and East Bengal now in Bangladesh – forms the long neck. The diasporic experience portrayed by the author forms one of the conflicts of the novel. It is in Oxford that the students from India namely the narrator, Sharma, shehnaz, and Mandira try to adjust themselves in their own ways. Each is conscious about of the strangeness of the 'one' that has been chosen "of having travelled great distances, of arriving... at a place that is not home, a feeling that cannot be recalled or understood later..." (63). The relationship they try to establish with each other is charged with the feeling of suppressed anxiety and loneliness, the sense that after the time of social intercourse, lectures, and studying at libraries, fade at night "in the solitary moment before falling asleep. Oxford seems to be a dream one is about to remember... that one has no existence for oneself, except in their absence" (67). The realization of being in transit remains so that all the characters and events only help them to feel the tangibility of the situation which otherwise would melt into dream. "It is the city that ultimately remains a kind of meeting place... never becomes one's own or anyone else's" (74). Amit Chaudhuri while describing India, especially Kolkata, Mumbai and Rajasthan portrays the life of his music teacher and the nuances of various ragas. This explanations form the basic thematic pattern of the novel. The narrator tries to overcome his experiences of diasporic cross-over through his commemoration of India, his music teacher, various ragas taught by him and so on. When the narrator in *Afternoon Raag* arrives in Kolkata on his university summer break, he notices: "In Calcutta, nothing has happened after Marxism and modernism. In tea-shops and street vendors, Bengali men, as ever, indulge in adda, a word that means both a pointless, pleasurable exchange in which it is conducted" (225).

Likewise in *Afternoon Raag*, while observing the English working classes in Oxford, the narrator muses: For them the supermarkets were built, to work in and to shop at. Not Sainsbury's but Tesco, with its long aisles of shopping-trolleys, sides of beef, and ham, frozen chips, mango chutney, and spinach at tuppence less. Towards such centres they gravitate .... Not for them history, old buildings, literature, but an England of small comforts and marriages, happy or unhappy. (206) Life is described here as the epitome of highly routinised consumerism as in Dirk Wiemann's words: "it is life dependent on prominent re-enactments of rituals of shopping, pubbing and soap opera watching" (221). This picture is put side by side with the world of the university campus: "This world is a different world from that of University; they never meet. The state of intoxication here, broken bottles, a beggar's foul breath, is more basic than the students' social drunkenness, a state of the soul" (207). While the description of the English families is reminiscent of a capitalist society, the social drunkenness of

University as well the social gatherings in Kolkata could be disruptive to the logic of capital. While establishing the conflict of the novel, the author has placed the intangible Oxford against the solid background of India. The time-frame used by the author in *Afternoon Raag* in describing India and telling the narrator's relationship with his music teacher is quite interesting. The author has used present tense in telling the present tale of Oxford and past tense while describing the life in India and the narrator's relationship with his music teacher. In this regard Devika Bose makes a pertinent remark on Chaudhuri's art: This is the present indefinite but soon after there is a smooth transit from the present to the past when the narrator describes a time.... Imperceptibly, there is a switch-on to the past where he recollects a few childhood events and then there is to be a journey back to the present. Time is fluid here and the past and the present gently unite creating the atmosphere suitable to hold the musical analogy that runs throughout the novel. (103) Thus it is through the author's eyes that readers note how easily the American-reared Bonny adapts to India, while his father, though a native, remains ill at ease throughout the summer simply because he has not come to terms with his own problems.

A year after his divorce, Jayojit Chatterjee, an economics professor in the American Midwest, travels to his native Calcutta with his young son, Bonny, to spend the summer holidays with his parents. Jayojit is no more accustomed to spending time alone with Bonny—who lives with his mother in California—than he is with the Admiral and his wife, whose daily rhythms have become so synchronized as to become completely foreign to their son. Together, the unlikely foursome struggles to pass the protracted hours of summer, each in his or her own way mourning Jayojit's failed marriage. And as Jayojit walks the bustling streets of Calcutta, he finds himself not only caught between clashing memories of India and America, but also between different versions of his life, revisiting lost opportunity, realized potential, and lingering desire.

Jayojit finds no humor in his parents' eccentricities, but the author draws the elder Chatterjees as an interesting pair whose peculiarities are rather endearing. Ruby's culinary mediocrity and her inability to deal with servants, for instance, are even funnier because she is married to a man who is obsessed with details. The Admiral is a man so inflexible that he considers a former drinking partner's failure to move to Calcutta a real betrayal; Ruby is so disorganized that she can barely see to the laundry. If ever a woman needed an automatic washer, Ruby does; however, her husband has so intense a distrust of modern conveniences that he will not even consider buying one. Chaudhuri's view of life as more often comic than tragic is also evident in his hilarious account of the apartment residents' meeting during which a number of colorful characters state their grievances and then disperse, all feeling much better, even though nothing has been resolved. Even after Jayojit begins to accept the inevitability of change, he does not see how funny it is, for example, that Mrs. Gupta has coped with the death of her husband by transferring her affection to a Pomeranian, whom she now walks daily just as she used to walk her ailing spouse.

*A New World*, then, is a more complex novel than a first reading might indicate. On one level, it is the account of a young man's discovery of some difficult truths about the world and the human condition—among them, that one can neither understand the past nor get rid of it and that the only certainty in this world is change. However, Chaudhuri's novel is also a comedy in which the author gently satirizes both upper-class Indian society and those who, like his protagonist, may have seen a good deal of the world but have not yet learned to laugh at themselves.

Jayojit's discoveries during his months in India involve the inescapable presence of the past. Jayojit sees photographs everywhere of himself as a child, himself with his brother, and Bonny at every stage of his development; although pictures of her are noticeably absent, Amala is, in a sense, a ghost always hovering about the Chatterjees. When his mother fusses about keeping Bonny out of the sun, Jayojit finds himself capitulating; even though her name is never mentioned, Amala is present, silently voicing her fears. She is even more troublesome when Jayojit is alone with his thoughts.

The frequent observations about the weather and the seasons in *A New World* serve as constant reminders of the inevitability of change and also of its unpredictability. For example, shortly after his arrival, Jayojit says that during the spring, one cannot tell in the morning just how hot it will be later in the day. It can only be assumed that as the day proceeds, the temperature will almost certainly rise. The characters in the novel also talk at length about the seasons. As spring becomes summer, they comment, each day will be different from the one that preceded it—generally hotter, but it is uncertain just how hot. Everyone knows, too, that every year the rains will come, but no one can predict exactly when. The only certainty, then, is that the weather will change; even the longtime residents cannot predict exactly how or precisely when.

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Though Chaudhuri means for Jayojit to be seen sympathetically, he does not look at him as a modern –day job but instead as a character too obsessed with himself to see anything humorous either in his own situation or in the social comedy around him.

To conclude in brief, post colonialism also a literary assessment to texts that carry racist or colonial undertones. Postcolonial literature, finally in its most recent form, also attempts to critique the contemporary postcolonial discourse that has been shaped over recent times. It attempts to assimilate this very emergence of postcolonialism and its literary expression itself.

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**THE PORTRAYAL OF URMILA AND SURPANAKHA IN KAVITHA KANE'S "SITA'S SISTER" AND "LANKA'S PRINCESS"****G. Elamathi<sup>1</sup> and Dr. K. Lavanya<sup>2</sup>**<sup>1</sup>M.Phil Research Scholar, Department of English, St. Joseph's College of Arts and Science for Women, Hosur<sup>2</sup>Head, Department of English, St. Joseph's College of Arts and Science for Women, Hosur**ABSTRACT**

Indian literature has mainly two epics. The Ramayana and The Mahabharata. The Ramayana is celebrated for presenting the prototypes of brotherhood and male companionship. It merely tells the story of Lord Ram. Kavitha Kane a mythological fiction writer is known for retelling the stories from the epics. In her novel "Sita's Sister" she brings out the impregnable sisterhood and it is the narration of the Ramayana from the view of Urmila. We come across many instances in the novel where women stand, speak, and support other women. We can also witness several virtues of women. Her other novel "Lanka's Princess" justifies the cruelty of Surpanakha and the reason behind the great war by listing out many situations which turned a soft woman to venomous. This paper will discuss Urmila's unknown story, her sisterhood, her character traits by presenting her as a strong, Positive figure. And, it will give limelight to Surpanakha's inner self where she becomes the victim of the situation.

An Epic is a prolonged poetic version of a hero who achieves many great things in his life. They are based on the theme where the good ones will be praised, and the evil ones will meet their fall. These epics teach us more virtues. Literature is the mirror of life. Indian literature has two jewels: *The Ramayana* and *the Mahabharata* in its crown. They are always appreciated as they teach a lot of lessons to mankind. Truly, they are the backbone of Indian culture. Of the two, *the Ramayana* is the story of Lord Ram which emphasizes on various life skills of Dharma. Ram known as Maryada Purushottama fulfills his PutraDharma.

It narrates the story of the crown prince, Ram who is sent to exile for 14 years due to the mastermind of Kaikeyi. Along with Ram, Sita, the wife of Ram, and Lakshman, the brother of Ram spends their life in the forest. The entire epic is written in Sanskrit by the sage Valmiki. The original epic has 24000 verses with 7 cantos. It tells the story of King Dasarath, his three wives- Kausalya, Kaikeyi, and Sumithra and his four sons- Ram, Lakshman, Bharath, and Shadrugan. It longs to Ram's exile, Sita's abduction by Ravana, Hanuman's army, the great war, his victory with the aid of Hanuman, and his successful return to his motherland.

Mythology refers to the compilation of stories, references, history, the appearance of God to teach Dharma to the world. Its themes include sacrifice, love, affection, penance, truth, chastity, devotion, rebirth, boons, and curses. *The Ramayana* has been hailed as the "Potent Corpus" of Mythology. There emerged a new genre called mythological fiction or mythic fiction which is inspired by themes, symbols of myths, legend, folklore, and fairytales. It is based on mythology loosely. Many writers emerged to write this genre as they have rich mythology as their source. However, the epic has been translated, modified, and deviated from the original version according to religion, people, and culture. AK Ramanujan in his famous essay, "*Three Hundred Ramayanas: Five Examples and Three Thoughts on Translation*" scopes various versions of the epic. Some deviate in terms of plot and character such as *Adbhut Ramayana*, *Dasaratha Jataka*, *Paunachariya*, *Gond Ramayani*, *Ramakirti*, and *Ramakien*.

Many Contemporary writers have tried to retell myths as a revolution to focus the hidden truths and details of it or to showcase the neglected one as a dominant one. Those hidden incidents direct the readers to see that neglected character from a different angle. One among them is Kavitha Kane who stands on the top of the list in bringing out the neglected, minor, unrepresented, and marginalized women characters. The famous writers of this genre include Anand Neelkantan, Chitra Banerjee Diwakaruni, Anuja Chandramouli, Amish Tripathi, and Ashwin Sanghi.

The traditional Ramayana is male-centric. Its approach is to put forth and to showcase male characters as predominant figures such as Lord Ram, Lakshman, Dasarath, Barath, and Asura Raavan. These Characters drive the plot thought-out the epic very seriously. However, these contemporary writers have given a new glimpse of the epic through their writings.

Kavitha Kane is a mythology-fiction writer. All her books are based on Indian mythology. She gives her voice to the minor characters of the epics. She retells the mythology in a different context. She takes her readers to the world of mythology through her characters. By reading her novels, one can witness the happenings of the plot. She presents them in a completely different perception. She carves them to speak out their innermost feelings

and emotions on those lesser-known mythological figures whom the epic would have shadowed, the society would have forgotten, or the legend would have marginalized. Some of her works include *Ahalya's awakening*, *Sita's Sister*, *Lanka's Princess*, and *Karna's Wife-the Outcast Queen*.

In one of her interviews, she clarifies her way of a portrait as she brings them unbiased. She says,

“Mythology, I believe should make you think, not judge. And that’s how I portray my women, without any bias, be it a dark character like Surphanaka in *Lanka's Princess* or the treacherous Menaka of *Menaka's Choice*. Or it is a strong positive character like Urmila. I am simply telling the unheard story of a Surphanaka or a Menaka and a Satyavati. I am not interested in painting the white black or black white.”

-Interview by Chakravarthy, 2018

I have chosen Kavita Kane's *Sita's Sister* and *Lanka's Princess* for this paper. The ancient version of the *Ramayana* Portrays Urmila as the wife of Lakshman. She never roams around in the epic. Truly, most of us would not have known the other side of her. She is presented as a very minor character who mourns for her husband's decision to ongoing exile. But Kavita Kane has brilliantly woven this character to give space to open her mind freely. Kane's Urmila is a good wife who acts according to her husband's wish. When she expresses her wish of accompanying Lakshman, he rejects it. He asks her to fulfill her Dharma i.e. taking care of his old parents and family. He is not aware of the agony and the pain Urmila undergoes. She feels bad for the safety measures of Sita in the forest. But no one knows that Urmila would also spend 14 years in personal exile without her husband in the palace. Kane excellently depicts how Urmila would have felt at that time.

“Both Lakshman and Sita are made their intention clear, they would be accompanying Ram and there was no room for any argument. Lakshman has forsaken her and Sita was going to leave the palace with Ram. The two persons whom she loved the most had left her, without a moment's hesitation.”

(*Sita's Sister*,142)

Kane's Urmila has all the feminine traits of the modern era and at the same time, she is very traditional. She has given voice to the muted Urmila and presented her as a woman of valor. She acts as a virtuous wife who fulfills her husband's wish by taking care of his family and plays the role of a wise daughter-in-law during the demise of king Dasarath. She takes charge of the kingdom and prepares the army for the war with the enemy kingdom. The readers are astonished by her knowledge and guts when she trains the army, investigates the affairs of the palace, and concerns about political issues. She proves herself as a strong woman. She spends her whole fourteen years as an independent wife, a loyal woman who is more confident and graceful.

Urmila is very bold as she delivers her wish openly to her husband in accompanying him for exile. She is outspoken and beautiful. She is very caring, a learned scholar, a great ruler who directs Barath in ruling the kingdom in the absence of Ram and Dasarath. Shekha rightly comments,

“...And among all these women, it is Urmila who comes out as the most influential character - outspoken yet respectful, headstrong yet calm, strong in the face of adversity, a learned scholar, with an ability to forgive, forget and look at the bigger picture, the tapasvi who has achieved understanding”

- Book review (2015)

Kavita Kane has talked about the character of Urmila:

“It is her untold story, her exile, her travails, trials, and tribulations as she waited for him, yet lived her life, without tears and self-sympathy... She was a strong woman but not much is known about her as she, unfortunately, is one of the most overlooked characters in the epic.”

Some critics have criticized Kavita Kane as her Urmila is beyond reality. Urmila comes forward breaking the walls of marginality that is imposed upon her by the male-centric society. Urmila is the biological daughter of King Janak and Queen Sunayana. Hence, she should have been hailed as “Janaki” as she is the daughter of Janak. However, Sita was named Janaki. Sita is “Maithili”, the Princess of Mithila when it is Urmila who should have been crowned with that title and the sole proprietor of that name.

Lakshman's wife Urmila is well educated. She is well versed in the Vedas and the Upanishads, politics, music, art, literature. King Janak had a learning-centered government that allowed all men and women to acquire all kinds of knowledge. His four daughters – Sita, Urmila, Mandavi, and Shrutakirti accompanied him to all the conferences and religious seminars across the country. Urmila is the character who wants to explore things

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around her and to learn her family customs, which she must perform after Sita's wedlock. She was not interested in getting married to anyone.

"Marriage did not hold much interest in Urmila, but it was a social discipline she would have to conform to. She would rather seek knowledge instead of suitor."

*(Sita's Sister, 9)*

When Lakshman and Urmila meet each other, they start to love. Lakshman accepts her. It is evident that Lakshman also is in deep love with Urmila when he expresses that beautiful moment in which Urmila looked at him haughtily in the garden with the pooja thali in her hand. When it comes to marriage, he refuses it. He has completely devoted himself to Lord Ram to fulfill his brotherly duties first throughout his life rather than his personal.

By knowing this too, Urmila still loves him. She says,

"No, I am yours. You are not mine. I love you that does not mean that I possess you, your beliefs, and your loyalties. I assure you that I shall never come between your loyalties your brothers and your family."

*(Sita's Sister,67)*

She appears to be very independent as she doesn't want to lock herself amidst four walls. She wants to upgrade and enhance herself by gaining knowledge. She has given her voice against any wrong or injustice done to her or other female characters in the novel. She fights for the right of the women in the royal family. When she comes to know that Maa Kaikeyi does not accept Sita as Ram's bride, Urmila could not tolerate it. She rushes towards Sita and starts furiously,

"...you shall not take it silently anymore Sita. They have the audacity to think of remarriage dismissing you as if you were some trophy to be replaced! I won't have it, Sita."

*(Sita's Sister, 100)*

Urmila comes to know that her other sister Mandavi is also going to face the same fate as hers and Sita's. Ram, Sita, and Lakshman are embarking on exile for fourteen years while Barath decides to administer the kingdom from Nandigram at the outskirts of the city. She becomes furious and asks him,

"...So be it, Bharath, like your brothers, Ram and Lakshman, you too live a life of ascetic, free from the bond of love and worldly care. Who cares whatever happens to your wife and family?"

*(Sita's Sister, 209)*

She is very adaptive when she finds out there is a vast difference between her motherland Mithila and Ayodhya. Mithila is unbiased and has a learning-centric approach that drives the people in observing knowledge but here Ayodhya seems to be a patriarchal-ridden one. She adapts herself quickly to follow the dharma and at the same time without even tolerating wrong deeds done to her as well as to others.

In the Swayamwar of Sita, when Ram breaks the Shiv Danush, Rishi Parsuram gets furious at him doing so. Lakshman has tried to comfort and console Rishi. However, Rishi Parsuram becomes more infuriated by Lakshman's explanation. It is Urmila who understands the situation better and she consoles Rishi Parsuram to save Lakshman whom she loves wholeheartedly.

"Urmila knew that she was ready to face the full fury of the Rishi anything to save Lakshman from the bloody fight from which he would never escape alive"

*(Sita's Sister, 38)*

On the other hand, Lakshman saves her.

"And while Lakshman had saved her from a violent predicament, so had she, snatching Lakshman from death."

*(Sita's Sister, 41)*

Urmila is a woman of high value. She determines herself in spending her whole life for the sake of her husband. Lakshman appreciates her as she is the very strongest woman, he has ever known. He comments that she is her strength and weakness. Thus, we come to know that Urmila is a highly positive figure who is marginalized in the ancient version.

“*Lanka’s Princess*” focuses on the dark character Surpanakha who plays a vital role in the epic. She is depicted as the queen of the world of destruction. *Lanka’s Princess* begins with one of the rebirths of Surpanakha where she is born with a hump on her back. This novel focuses on how cruel and revengeful Surpanakha is. The author has also tried to bring out the reason behind her hatred. It is the highly celebrated novel of Kavitha Kane in which she has retold the story of a little girl, named Meenakshi, who is born as the Princess of Lanka. Since her childhood, she has been remarked as “ugly” and “cruel” by her mother and brothers. This novel deviates from the versions of the Ram-centric and the Sita-centric to the cruel Surpanakha. Devdutt Pattanaik figures out that Surpanakha approaches Ram to quench her thirst for desire where Ram rejects and toys with her emotions and Lakshman mutilates her nose. He comments,

“Surpanakha is behaving as a creature of the forest would behave. She wants Ram and she expresses her desire freely without embarrassment. But Ram is not of the forest. He clings to dharma and rejects the proposal. Surpanakha responds as forest creatures would, with force, Lakshman then reacts as a city dweller would he has stricken her with the intention of the family her”

(Pattanaik, 64)

Male writers have chiefly dominated our ancient tradition and mythology. The retelling of myths is a major part of feminist writing to bring women into lives. The major motif of retelling myths is to break down the female subjugation and male-centered attitude. *Lanka’s Princess* is one of such novels which attempts to give voice to the ignored or peripheral woman, Surpanakha who is a demon in Valmiki Ramayana. In this book, she is depicted as the truly loving and lovable woman who longs for care and affection.

She is often a misunderstood character. Kane raises the question of whether she is truly a monster or a victim of the situation. Since her childhood, she is neglected, and she is the woman who decides her future and fights for her rights. The story opens with the birth of Surpanakha. It is Kaikesi the mother of her utters these words:

“She hardly looks beautiful or like me. She is quite ugly...She is scrawny and much darker than me”

(*Lanka’s Princess*, 1)

It is evident that the mother Kaikesi also hates her child due to the dark appearance. But Kane flips the story of Ravana’s sister Surpanakha from the ancient version’s dark depiction. She justifies that Surpanakha is not so cruel as the epic portrayed. She lists out various reasons which modified her to a wretch minded. Not all the person in the world is cruel. A person becomes or turns cruel when he is ill-treated or when he loses a thing or a person whom he loved the most. At that point, he plans to take revenge on his rival. The same thing happened in the case of Meenakshi who is none other than Surpanakha. Obviously she is the protagonist who is very strong in taking decisions. She is the fourth child of that family.

Ravana calls her dark. Her mother calls her ugly. It is who Vibishan, the only brother, notices her eyes and compares them to “golden drops”. She was rightly named Meenakshi- a girl with fish-shaped eyes. She has been hated by everyone when she marries her lover Vidhyujiva, the Prince of Kalkeya.

This agony, loneliness, longing for love, childhood trauma and all made her cruel. Like other women, she too had so many dreams of her marriage. Due to her appearance, there were no marriage proposals to her. At this time, she had a chance to meet Vidhyujiva and started to love him blindly which ended in their marriage. She knows very well that Ravan would kill him. She is very fond of her Nany and her uncle. Ram and Lakshman kill them in the forest and so the hatred and the agony prolongs in the form of revenge. She loses her father accidentally, but she thinks that Ravana has killed him.

“You killed all my hopes, my future!”

(*Lanka’s Princess*,171)

Gradually the hatred is getting cultivated. On the battlefield, Vidhyujiva is killed. She loses her loved ones. She moves to the forest with her son Kumar. They start to reside there in Mareech home. She injects her venomous traits into her son too. He wants to kill the person who killed all his mother’s future.

“...go son, achieve the impossible and fulfill your responsibility... I would burn Lanka to another Dandak”

(*Lanka’s Princess* 181-182)

Kumar is also killed by someone in the forest. She could not tolerate the loss of her son. She started recollecting the past. It is Ravana who killed her husband. If he had not killed him, she wouldn’t have settled in the forest. She loved the forest very much as it is the place where she trained her son and pulled him in the chain of

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revenge. This is the place that welcomed her. This is the place that turned that soft Meenakshi to venomous Surpanakha.

“...from today I would be the Surpanakha, she reflected, as she passed the row of members of her family...yes, I am a monster! Screeched Meenakshi, her eyes flashing, baring her claws...if anyone hurts me, I shall hurt them with these!! I am Surpanakha!”

(*Lanka's Princess*, 175-176)

She cleverly calculates that her brother Ravana could be killed by Ram and Lakshman. She wants to trap them brilliantly. Surpanakha goes into the thought of Ravan's weakness and gets to know that it is his lust for women. On the other hand, Ram's weakness is his love for Sita. So, both their weakness is none other than Sita. Amidst this Ravan's wife Mandodari informs her that she has made Ravan lead a war in Lanka. She becomes a monster to execute her plans. She has been a trapper than his sister. Soon the war starts. Many start to lose their lives. When the whole Lanka city is on fire, her happiness knows no boundary. She feels very happy as she is heartless. She lastly has tasted the fruit of success through her revenge without any mercy.

“...hate was bitter, but revenge was always sweet.”

(*Lanka's Princess*, 265)

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**THE ROMANTIC ERA IN ENGLISH LITERATURE**

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**G. Nithya**Assistant Professor of English, St. Joseph's College of Arts and Science for Women, Hosur

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**ABSTRACT**

*The Romantic Movement within the arts is often defined as a “revolution”, artistic moves are inevitable progressions out of the durations preceding them, at first growing slowly, then accelerating, peaking, and subsequently declining. Art additionally moves via area, following paths across countrywide borders. When we trace the direction through the instances and places of Romanticism, the concept of evolution instead of revolution becomes greater apparent. This research paper investigates the development and evolution of French and English. Romantic poetry, French and England have a unique bond of records, political interference, war, adventure, and luck that deserve as a whole lot credit as inventive genius for the literary traits in both countries. The artists usually form fast friendships and end up coaching and helping each other despite the family members of their governments. I even have tracked the evolution of Romantic poetry in those two international locations beginning with Shakespeare. I observe literature via the political and sociological adjustments of the seventeenth and eighteenth centuries to the beginning and top of the English romantic poetry. French Romantic poetry developed after English Romantic poetry became already in decline, and I discover how the English poets inspired the French who were rustic removed.*

*The Romantic Movement coincided with the rapid and some distance-attaining sociological changes swayed and, as the tempo of industrialization and democratization accelerated, finally overtook this style of art. As the arena changed, so did the patterns, issues, and tones of Romantic poetry, even though within United States of America, Romantic poetry encompassed a huge variety of poems. I even have attempted to highlight and give an explanation for those similarities and variations in English and French Romantic poetry with the aid of analyzing distinguished issues, ideas about thought and creativeness, and poetic form.*

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**INTRODUCTION:**

Romanticism (also the Romantic generation or the Romantic duration) became an artistic, literary, and intellectual movement that originated in Europe towards the end of the 18th century and in most regions changed into at its height within the approximate length from 1800 to 1850. Partly a response to the Industrial, it became additionally a rebel in opposition to the aristocratic social and political norms of the Age of Enlightenment and a reaction against the scientific rationalization of nature. It become embodied maximum strongly within the visual arts, tune, and literature, however had a main impact on historiography, training and the natural sciences. Its effect on politics turned into enormous and complex; its long-term effect on the increase of nationalism become likely greater sizeable. The motion proven intense emotion as an actual source of aesthetic experience, setting new emphasis on such emotions as apprehension, horror and terror, and awe—mainly that which is skilled in confronting the sublimity of untamed nature and its picturesque traits: both new aesthetic classes.

**THE START OF ROMANTICISM:**

Robert Burns is taken into consideration the pioneer of the Romantic Movement. Although his loss of life in 1796 precedes what many recall the start of Romanticism, his lyricism and sincerity mark him as an early Romantic writer. His maximum exceptional works are “Auld Lang Syne” (1788) and “Tam o’ Shanter” (1791). Burns stimulated some of the writers for the duration of the Romantic Period.

William Blake became one of the earliest Romantic Period writers. Blake believed in non secular and political freedom and frequently wrote about these issues in his works. Although a number of his poetry became published before the authentic begin to the technology, Blake can be seen as one of the founders of this motion. His works, Songs of Innocence (1789) and Songs of Experience (1794), of his maximum tremendous. These collections of poetry are a number of the first to romanticize children, and in these works Blake pits the innocence and creativeness of adolescence against the tough corruption of adulthood, in particular within the metropolis of London. He became additionally regarded for his beautiful drawings, which accompanied each of those poems.

**ROMANTIC POETRY:**

Scholars say that the Romantic Period began with the publishing of Lyrical Ballads (1798) through William Wordsworth and Samuel Taylor Coleridge. This changed into one of the first collections of poems that strayed from the greater formal poetic diction of the Neoclassical Period. Poets of the period rather used regular words

that the common character could apprehend. This also aided in expressing human emotion. Wordsworth broadly speaking wrote about nature. He felt it may provide a supply of mental cleanliness and religious information. One of Wordsworth's well-known works is "The Solitary Reaper" (1807). This poem praises the splendor of song and indicates the outpouring of expression and emotion that Wordsworth became essential person in poetry. His best piece is *The Prelude* (1850), a semi-autobiographical, communicate poem that chronicles Wordsworth's complete existence. Conversational poetry became the literary genre maximum commonly used by Wordsworth and Coleridge, with the latter writing a sequence of eight poems following the genre shape of conversational verse and analyzing better thoughts of nature, guy, and morality. This poetry is written in clean verse and is extremely private and intimate in nature, with a whole lot of the content material based totally on the writer's lifestyles.

Coleridge and Wordsworth have been superb buddies and the two often prompted each different. While Wordsworth turned into much extra meditative and calm, Coleridge was the alternative and lived a extra uncontrolled existence. Of his three foremost poems simplest one is complete: *The Rime of the Ancient Mariner* (1798). This poem tells the story of a sailor's journey and his stories at the deliver. The sailor is cursed by means of supernatural powers and is best capable of return home while he appreciates the animals and nature round him. He is compelled to wander the Earth sharing his tale due to his in advance errors. His two other lengthy form poems are *Kubla Khan* (1816) and *Christabel* (1816). According to Coleridge, his poem *Kubla Khan* came to him in an opium-induced dream after studying a work about Chinese emperor Kublai Khan. He become never capable to finish the paintings. *Christabel* tells the tale of the name character assembly a stranger named Geraldine who asks for *Christabel*'s help. Ignoring the supernatural signs, *Christabel* rescues and takes her home, however it seems that the stranger isn't normal. Coleridge become best able to complete out of his 5 supposed parts to the poem.

#### **THE FIRST GENERATION OF ROMANTIC POETS:**

The maximum critical Romantic poets may be categorised into two corporations, the first generation and the second one technology. The first generation of poets that created the premise for the later ones covered were Samuel Coleridge (1772-1834), William Blake (1757-1827) and William Wordsworth (1770-1850) Charles Lamb (1775-1834), Jane Austen (1775-1817), and Sir Walter Scott (1771-1832). Charles Lamb is maximum famous for his poem "The Old Familiar Faces" and his essay "Essays of Elia." At one point he turned into mentally unwell and spent a while in a psychiatric health center. His sister went insane and stabbed their mother to dying, substantially affecting his writing for a long term and forcing him to attend to her. Jane Austen is maximum commonly regarded for her novels "Sense and Sensibility" and "Pride and Prejudice." Her novels have been no longer well-known thoroughly and didn't deliver her lots repute while she become alive, but now she has been customary as one of the pleasant authors of the English language. "Northanger Abby" became published once she had passed away and sold excellently for a 12 months. Sir Walter Scott is thought for his poems like "The Lady of The Lake" and his ballads. He centered and confirmed an hobby for Scottish records in his works. Scott turned into study everywhere in the global throughout his time such as readers in parts of Europe and North America.

#### **THE SECOND GENERATION OF ROMANTIC POETS**

Succeeding Blake, Coleridge, and Wordsworth turned into a brand new era of poets, every following the pattern of Romanticism of these before them. John Keats remains one of the most famous of those poets, with his paintings continually read and analyzed these days. Keats aimed to express extreme emotion in his poetry, the usage of herbal imagery to try this. He is widely recognized for his odes, lyrical stanzas that are generally written in praise of, or in determination to, something or someone that the author admires. These odes followed the genre of lyrical poetry and focused on intense emotion the usage of non-public narrative. Among these odes, "Ode to a Nightingale" (1819) and "Ode on a Grecian Urn" (1819) are most famous. Keats was preoccupied with loss of life and getting old throughout his existence, that's proven in every of those two odes. "Ode to a Nightingale" discusses the temporary repute of existence and splendor, but in "Ode on a Grecian Urn," he explores the artistic permanence of the pix on the urn.

Percy Bysshe Shelley become seen as a thorough philosopher for his spiritual atheism and largely ostracized via his contemporaries for his political and social perspectives. One of his most well-known works is *Adonais* (1821). This was a pastoral elegy, a poem combining loss of life and rural existence, written for John Keats. The poem mourns the demise of Keats and his contribution to poetry. Another of his famous works was *Ode to the West Wind* (1819) wherein he discusses the pressure and power of the wild wind and indicates the Romantic author's tendency to connect nature with art.

Lord Byron differed from the writing kinds of Keats and Shelley. He was closely encouraged through the satire and wit from the previous period and infused this in his poetry. His satire Don Juan (1819-1824) is told in 17 cantos, divisions of long poems, and is based at the conventional legend of Don Juan. Byron adjustments the original telling of the story and rather than creating a womanizing individual, he makes Don Juan a person effortlessly seduced by using women. The cantos follow his man or woman's adventure as he travels at some point of Europe assembly numerous girls and continually seeking to break out from problem. Byron's other fantastic paintings is Childe Harold's Pilgrimage (1812-1816), any other lengthy narrative poem. This poem changed into largely biographical and discusses a lot of Byron's private travels. It describes the reflections of a younger man who's in search of new beginnings in overseas nations after experiencing many years of warfare. This poem is good sized as it added the Byronic hero, generally a handsome and smart man with a bent to be moody, cynical, and rebellious towards social norms.

**CHARACTERISTICS OF ROMANTICISM:**

Romantics believed in the herbal goodness of human beings that's hindered by the urban existence of civilization. They believed that the savage is noble, youth is good and the feelings inspired with the aid of each beliefs reasons the coronary heart to leap.

**STRONG SENSES, EMOTIONS, AND FEELINGS:**

Romantics believed that expertise is gained via instinct as opposed to deduction. This is high-quality summed up by Wordsworth who said that "all true poetry is the spontaneous overflow of powerful emotions."

**AWE OF NATURE:**

Romantics stressed the awe of nature in artwork and language and the revel in of sublimity via a connection with nature. Romantics rejected the rationalization of nature via the preceding thinkers of the Enlightenment period.

**CELEBRATION OF THE CHARACTER:**

Romantics frequently accelerated the achievements of the misunderstood, heroic person outcast. Romantics legitimized the individual creativeness as an important authority.

Romanticism emerged as a response in opposition to 'The Age of Enlightenment', which emphasized on cause and logic. Pioneers of the Romantic length wanted to break away from the conventions of the Age of Enlightenment and make manner for individuality and experimentation. The Romantic motion is said to have emerged in Germany, despite the fact that the principle source of concept got here from the occasions and ideologies of the French Revolution. The Industrial Revolution, which started out for the duration of the equal length, is likewise said to be chargeable for the development of this motion. Though Romantic elements have been present in art and literature considering the fact that numerous centuries, turned into the book of 'Lyrical Ballads', a group of poems through William Wordsworth and Samuel Taylor Coleridge, in 1798 that ushered forth the Romantic duration. Let us now recognize this concept in detail.

**FEATURES OF ROMANTICISM:**

Literature became the first branch of artwork to be inspired by using the waves of Romanticism, despite the fact that the concepts continue to be the equal in all the art paperwork. Let us study some of the traits which prompted the Romantics.

**LOVE OF NATURE:**

The Romantics substantially emphasised the significance of nature and the primal feelings of awe, apprehension and horror felt through guy on drawing near the sublicenses of it. This was particularly because of the commercial revolution, which had shifted lifestyles from the non violent, serene countryside towards the chaotic towns, reworking in an individual's herbal order. Nature changed into no longer only favored for its visible splendor, but additionally respected for its ability to assist the urban individual to discover his genuine identification.

**EMOTIONS VS. RATIONALITY:**

Unlike the age of Enlightenment, which centered on rationality and mind, Romanticism positioned human feelings, feelings, intuition and instinct above the entirety else. While the poets inside the generation of rationality adhered to the widespread policies and rules while deciding on a topic and writing about it, the Romantic writers depended on their feelings and feelings to create poetry. This perception can be showed from the definition of poetry by William Wordsworth, in which he says that poetry is the spontaneous overflow of effective feelings. The emphasis on emotions also unfold to the song created in that length, and can be determined within the compositions made by way of musicians like Weber, Beethoven, Schumann, and many

others. Beethoven performed a critical function in the transition of Western music from the classical to the Romantic age.

**ARTIST, THE CREATOR:**

As the Romantic length emphasized on human feelings, the location of the artist or the poet also won supremacy. In the earlier times, the artist was visible as a person who imitated the external international through his artwork. However, this definition became mooted inside the Romantic generation and the poet or the painter turned into visible as a writer of some thing which reflected his individuality and emotions. The Romantic belief of the artist because the writer is high-quality encapsulated by using Caspar David Friedrich, who remarked that "the artist's feeling is his law". It turned into additionally the primary time that the poems written in the first person had been being conventional, as the poetic personality has become one with the voice of the poet.

**NATIONALISM:**

The Romantics borrowed closely from the folklore and the famous nearby artwork. During the sooner eras, literature and art had been taken into consideration to belong to the high-elegance knowledgeable humans, and the lower instructions had been no longer considered match to revel in them. Also, the language used in those works used to be particularly lyrical, which was totally exclusive from what was spoken by using humans. However, Romantic artists took no disgrace from being prompted by the folklore that have been created by the hundreds or the not unusual human beings, and now not by way of the literary works that were famous simplest some of the better echelons of the society. Apart from poetry, adopting folks tunes and ballads changed into one of the very crucial traits of Romantic song. As the Romantics became fascinated and centered upon developing the folklore, lifestyle, language, customs and traditions of their own. They advanced a sense of Nationalism which reflected of their works. Also, the language used in Romantic poems became easy and easy to recognize through the hundreds.

**EXOTICISM:**

Along with Nationalism, the Romantics advanced the affection of the distinctive. Hence, far off and mysterious places have been depicted in the various artistic works from that period. Though this changed into not precisely apposite to the Romantic perfect of Nationalism, separate factions were in no way formed. Exoticism is likewise one of the most distinguished traits in art, together with sentimentality and spirituality.

**SUPERNATURAL:**

Another characteristic of this movement is the notion inside the supernatural. The Romantics have been inquisitive about the supernatural and covered it in their works. Gothic fiction emerged as a branch of Romanticism after Horace Walpole's 1764 novel *The Castle of Otranto*. This fascination for the mysterious and the artificial additionally led to the improvement of Gothic romance, which have become popular for the duration of this period. Supernatural factors also can be visible in Coleridge's *Kubla Khan*, *The Rime of the Ancient Mariner* and Keats' *La Belle Dame Sans Merci*.

As no Romantic artist followed any strict set of regulations or rules, it's miles tough to define the characteristics of this movement correctly. Nevertheless, a number of these characteristics are contemplated inside the works of that duration. Though many writers and critics have known as this motion "irrational", it can not be denied that it changed into an honest try and painting the sector, especially the intricacies of the human nature, in a paradigm-shifting way.

**CHARACTERISTICS OF ROMANTIC LITERATURE**

- a. **Imagination:** In the words of William Wordsworth, 'poetry is the first and ultimate of all information'. The phenomenon of creativeness is the essence or core of romantic poetry. According to romantic poets, it's far possible to achieve a transcendental revel in through imagination. It takes us near to the non secular fact.
- b. **Emotions:** On the subject of romantic poetry, motive and good judgment take a backseat. The one aspect which rules the sector of romanticism is emotion. Romantic poetry is one of the excellent manner to let out one's emotions via words. The overflow of feelings depicted via romantic poetry transcends the boundaries of logical reasoning. Spontaneity in romantic poetry arises from an emotional outflow, and once in a while ache is the foundation.
- c. **Nature:** A romantic poet can let out his/her creativeness inside the procedure of decoding herbal phenomena. It is stated that romantic poetry associated with nature is a sort of a meditative technique. The rationalists tend to view or partner nature with some kind of system. A romanticist's notion of nature is that of an organic phenomenon. Nature is also viewed as a putting or place which gives respite from the artificial international that we inhabit.

- d. **Pastoral Life:** The pastoral life, tradition and traditions are stated on a common basis in romantic poetry. In most instances, at ease and sluggish-paced pastoral lifestyles of shepherds is depicted in those poems. Romantic poetry employs this selection so as to gift before readers the complexities of life in a easy manner. Contrasting capabilities of concrete existence can also be depicted via the portrayal of pastoral life.
- e. **Symbolism:** Symbolism is a manner of expressing so much in so little. The use of symbolism in literature allows inferring / deriving unique meanings from a unmarried expression. Symbolism rouses the interest of readers and also provides a form of enigma to the expressions or thoughts of the poet. Representing a specific aspect allegorically, lies at the middle of symbolism. Repetitive presentation of an item or character is one of the approaches wherein symbolism is depicted in poetry.
- f. **Individualism:** It is one of the vital romantic poetry characteristics. Representation of a hero, a person with brilliant genius, is of common incidence in romantic poetry. Heroes are depicted as personalities which showcase boldness. This great boldness is in comparison with that of restraint depicted in historical classics.

### **ROMANTICISM AND INDUSTRIALIZATION**

The literature research paper on Romanticism in Literature states the alienation inside the face of industrialization that many people started out to specific for the duration of the past due 1700s and early 1800s ended in a reassessment of the traditional approaches of thinking and viewing the external international that had persevered for quite some time. The upward push of the town as the new landscape compelled new parameters for the connection between humans and the world. Although the momentum of progress made it clean that the technological advances have been not going to give up their headway, it changed into increasingly more uncertain what role the man or woman became going to play inside the industrialized international.

### **CONCLUSION:**

Finally, Romantics had been recognized for who prefer solitude and discovering the mysteries of existence individually over social life and residing with the society and pursuit its improvement because this improvement has lead to a variety of wars and destroyed nature and animals' habitats. One of the poets who showed this tendency is John Clare in his poem 'I am'. For instance he said "I long for scenes where guy hath never trod". This solitary existence can provide them a reference to God because we usually are closer to God while we worship him for my part. Another poet who preferred solitude over being inside the society is John Keats. For example, he said that he might drink some thing heavy and fade to the forests where there are no issues. He additionally advised the nightingale to fade into the woodland and revel in life's wonders and splendor.

In end, Romanticism is a set of poets who emphasized the function of nature in our lives and the nation of being on my own whilst taking into consideration nature and worshiping God. They additionally tended to hire their feelings and feelings of their poems. Further, Romantics tended to get away to imagination wherein they are able to get what they want because in truth that is hard to achieve. All in all, no one can deny the position of romantic poets in enriching social sciences, particularly literature and poetry.

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**CHOSEN ELEMENTS OF THE VICTORIAN PERIOD IN THE WORKS BY A.C. DOYLE**

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**U. Monisha, L. Jenniffer and Monisha**Assistant Professor, St. Joseph's College of Arts and Science for Women, Hosur

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**ABSTRACT**

*The 'selected aspects of the Victorian Era' In progress by A. C. Doyle' manages chosen highlights of the Victorian time frame. The primary objective is to exhibit that the story isn't just mainstream analyst fiction yet in addition a dependable social and verifiable reflection. The hypothetical part portrays the picked viewpoints; specifically society and sexual orientation generalizations, science and innovation, and Victorian London versus country life. Down to earth part investigations how the points are imagined in the books by A. C. Doyle and it additionally attempts to discover which hints of naturalistic abstract style are prominent.*

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**INTRODUCTION**

The detective stories about Sherlock Holmes and his companion Dr. Watson by Sir Arthur Conan Doyle are renowned everywhere. With its strange plots, desolate settings and critical characters, it has become a need for every single analyst lovers. By the by, just couple of individuals ponder its verifiable foundation set in the second half of the nineteenth century when the English Realm had numerous abroad states, it can give us a sufficient image of the Late Victorian time frame, among others its rich culture and multicultural society.

The point of this proposition is to attempt to investigate and look in the books by A.C. Doyle for the depiction of the chose parts of the Victorian period. The primary spotlight is on sexual orientation jobs as a significant part of the Victorian culture. The job of ladies had changed all through the period, yet the predominance of men was obvious. Furthermore, since this period is viewed as the second modern transformation in England and is likewise brimming with new disclosures in inherent sciences.

Everybody ought to have some essential consciousness of world history and culture. Nonetheless, just couple of individuals do appreciate examining specific history books or course readings. An awesome arrangement is, subsequently, perusing some well known writing set in the period we need to investigate. Then again, it is difficult to depend on the substance of each and every book. In this manner endeavor to see if the accounts by A.C. Doyle can be viewed as those solid sources and the amount we find out about the Victorian time frame from the writings with Sherlock Holmes and Dr. Watson. The primary objective is to exhibit that the story isn't just well known analyst fiction yet additionally a solid social and authentic reflection.

**VICTORIAN SOCIETY:**

The point of the section is to give an attitude toward the fundamental parts of the Victorian culture to portray the period the books about Sherlock Holmes were written in. Initially, general realities about the period are summed up; later on, the part is centered around two critical parts of the Victorian culture, in particular gender roles and culture life.

Victorian period is molded by the Sovereign Victoria's extended rule, from 1837 to 1901. This long period of the English history is loaded with changes. The most recognizable changes are identified with the mechanical innovations and clinical advancement, metropolitan and populace extension, sexual orientation jobs and religion. It is affirmed by Allen in English writing in setting (2008), where she characterizes Victorian age by three primary words – "progress, expansion, mobility" (Allen 403). Victorian period is separated into three primary parts: early, mid (high) and late. Victorians esteemed strength and custom and as Moran specifies in *Victorian writing and culture* (2006), they envisioned their general public as an amicable 'family' with obligation, compassion and regard (Moran 2). They recognized themselves with the Sovereign Victoria, who had a cheerful and enthusiastic marriage. She was both a ruler just as cherishing mother in a similar time, in spite of the fact that it was fairly romanticized by the Victorians (Veldman, Britannica).

Toward the start of the nineteenth century, religion assumed a significant part in individuals' life. Educator Richard J Evans says in his talk at Gresham School that "the Victorian Age was certain a strict age" and "numerous victorians accepted that the Bible was the best, indeed in many cases the only guide to a moral life" (Evans, "Religion and Science"). In addition, from the mid-1880s the Branch of Science and Workmanship began to coordinate its endeavors towards auxiliary training for the lower-center and upper-working people and in 1902 another Instruction Act made arrangement for optional schooling (Harrison 203).

In the high Victorian time frame, accomplishments in the spaces like industry, economy, innovation and science were critical and individuals were affected by them additionally in the late Victorian period, when the

progressions continued. Metropolitan expansion were quickly expanding populace were different highlights ordinary for both, high and late Victorian period. The strict confidence was compromised by logical disclosures. Individuals' questions about strict even expanded get-togethers arrival of Darwin's theory of evolution. Thus, strict was at this point not in the frontal area of the general public in the time Doyle was composing his accounts and books about Sherlock Holmes

### **GENDER ROLES:**

Huge contrasts which actually persevered are those associated with gender roles. As Moran specifies in *Victorian writing and culture* (2006), "In Victorian culture, ladies were venerated, ensured and abused" (Moran 35) and their blamelessness, immaculateness and maternal senses turned into a motivation for books as well as paintings (35). It was changing all through the nineteenth century, yet the common ideal Victorian 'vision of the womanhood' was centered around marriage and home. Ladies were required to monitor good and homegrown qualities. Young ladies before marriage were required to be honest (Harrison 157-183). Nonetheless, ladies' life contrasted among the classes and hence, common ladies, working class ladies and privileged ladies should be recognized.

As per Calder in *The Victorian Home* (1977), center and privileged ladies were not extremely dynamic. They remained at home more often than not, teaching their workers and doing embroidery. Then again, in the second half of the nineteenth century it arose that occasionally working class ladies needed to make money. Thus, they made an honest effort to wed well so as not to have such a destiny (Calder 22). The existence of the working class ladies was influenced by 'the way of thinking of the different circles'. Ladies were said to suit best for the 'homegrown climate'. Men, interestingly, were professed to suit for the public life, better callings and dynamic life (Moran 35). The privileged ladies were obliged to remain at home more often than not in any case when strolling alone on the roads they were believed to be whores or a lower class-working ladies (Nead, "Ladies and Metropolitan Life in Victorian England"). The situation with ladies began to work on in the second half of the Victorian time. In 1857 the Wedding Causes Act made separation simpler to acquire despite the fact that a proof against their significant other was required and it was difficult to track down adequate proof (Moran 38). From 1878 ladies in England could take full degree courses. Also, in 1882 they arrived at certain rights over their ownership that ladies had possessed before the marriage.

Comprehensively talking, ladies' life in the Victorian period was troublesome since the entire society was influenced by biases and sex generalizations about men's prevalence. Indeed, even at the turn of the twentieth century were ladies seen as second rate creatures however they had more rights and became more as grounded people.

### **CULTURAL ROLE:**

Discussing the way of life, the workmanship assumed a significant part in this period, for the upper as well as working class. The craftsmanship "was seen as a significant indication of the country's ethical well being and a vehicle for passing on friendly qualities" and saw as kind of schooling for the country; agreeable, pleasurable and provocative. In the second half of the nineteenth century, a premium in culture styles, for example, Middle East, India, China and Japan influenced the Victorian culture.

Individuals visited numerous presentations and theaters which were viewed as fundamental get-together. More freedoms in any event, for the helpless classes may be recommended by the free entrance into the Public Exhibition, which empowered the entrance not exclusively to the favored classes yet in addition to the helpless ones music was mainstream among individuals, as well music corridors and shows were joined in. Aside from going to theaters, presentations and shows, perusing was increasingly more well known since printed material became less expensive and the proficiency rates expanded; libraries were available likewise for the working and working classes since they were free. The press can be considered as another unmistakable element; loads of week by week magazines were delivered. In the portion of the nineteenth century, there was an immense extension of papers; among them, *The Daily Telegraph* Transmit as the most famous (Morgan 468).

Openings for the relaxation exercises were higher because of more limited working hours and higher wages. Individuals could travel considerably more and the travel industry formed the general public. In the Victorian time, numerous cutting edge sports were presented; mainstream sports included for example cricket, cycling or croquet (Moran 38).

In the second half of the nineteenth century, generalizations about the sexual orientation jobs were still exceptionally solid, likewise upheld by Charles Darwin's work *The Descent of Man*, and *Selection in Relation to Sex* (1871). His portrayal of man as more grounded, all the more impressive and better over lady may have influenced the Victorian culture.

**SCIENCE AND TECHNOLOGY:**

The subject of science and innovation since they assumed a vital part in the Victorian period. An enormous advancement could be found in regions like science and medication; new inventive methods of voyaging and current innovations were presented. Also, it was a time of serious industrialization. In the books by A. C. Doyle, these points are often behind the scenes of the plot. As Allen calls attention to in English writing in setting in 1831 the English Relationship for the Progression of Science was established. It is clear then, at that point, that science and innovation assumed an essential part during the Victorian time frame. Also, science turned into a piece of the educational program in some main colleges in England (Allen 417-418). Science could be either a leisure activity or a calling.

Discussing the development and new innovations in movement, the quantity of rail routes exceptionally expanded. In addition to the fact that it transported individuals, yet additionally merchandise; it turned into a significant public course framework and it prompted speedier and more secure method of voyaging. As Morgan says in *The Oxford outlined history of England* (2009), in the nineteenth century there were around 8,000 miles of rail route lines and the advancements in transportation framework were a reason for fast urbanization (Morgan 474). In London, aside from the rail line, the underground was set up in 1863 and zapped in 1902. Alternate methods of transport contained taxis, ponies, trucks, cable cars, trams, omnibuses and carts. Doyle's accounts are firmly associated with these spaces since Holmes is a researcher and Watson a specialist. Likewise loads of average folks were keen on science in the Late Victorian time frame. The Victorian period monitored progress also in the area of technologies; there were lots of innovations in travelling.

**URBAN VS. RURAL LIFE:**

Anecdotes about Sherlock Holmes are for the most part set in the capital of the English Realm, London; subsequently, the section investigates the life in the Victorian urban communities zeroing in on the capital of the English Domain. Nonetheless, *The Hound of the Baskervilles* (1902) is set in Devon and *The Valley of fear* (1914) in Sussex, taking us to the country spaces of Victorian Britain. Country regions were influenced by the cycle of urbanization; they became ousted. The part accordingly attempts to draw the two kinds of life in Victorian Britain. Auxiliary writing the part manages *The Oxford delineated history of England* (2009) altered by Kenneth O. Morgan and London: *The Biography* (2001).

Because of advancements in voyaging and advances in the Victorian time, individuals from the rustic regions began to drive to towns; the cycle of urbanization was going on. More freedoms to look for some kind of employment and furthermore higher wages for less long stretches of working prompted country termination; a few group passed on to urban communities, some to the coalfields, some to the settlements and some to the arm. Because of it, the urban areas developed quickly and country customs were separated (Morgan 479). Toward the finish of the nineteenth century, just around one-fifth of the populace lived in provincial spaces of Britain and Ridges. London was, clearly, a 'magnet' for individuals from one side of the planet to the other and its populace expanded staggeringly; from 2.3 million of every 1851 to 4.5 million out of 1911 or 7.3 million with suburbia (474). It was a consequence of generally spread railroads just as industrialization; in the late nineteenth century and the start of the twentieth century 'the second modern transformation' was going on. This upset is principally associated with the quick development of railroads, steel creation, extension of transmit lines and the phone, the beginning of zap, and new information in regions like medication and science, which made the life quicker and simpler (Britannica, "Modern Transformation").

**LONDON:**

London in the nineteenth century can be depicted as colossal; the city pulled in individuals from one side of the planet to the other and was rising unbelievably. Living in London had both, the splendid and hazier side. In the second half of the nineteenth century London was progressively changing and turned into the city of domain; with every one of the lodgings, docks, markets and other public spaces; in addition, there were a few music corridors and numerous venues in the middle, bunches of shops and cafes. In the mid twentieth century new banks and workplaces were assembled (Ackroyd 717). The methods of transport were another benefit; the average image of the roads is the one loaded up with stream of traffic – vehicles like taxis, ponies, trucks, cable cars, hansoms, omnibuses and carts; later, early vehicles and could be seen.

Individuals might have found there everything – lodgings, eateries and theaters - yet in a similar time London turned out to be extremely indifferent and terrifying; it was outlandish for human to remember a particularly colossal spot with every one of the roads. London's unfathomably and development caused anxiety for some 'local Londoners' since it did impact and completely change them. Not only noisy but also filthy was Victorian London. Filth is a negative aspect often associated with Victorian London. Lee Jackson describes the state of the 19<sup>th</sup> century London in *Dirty Old London: the Victorian fight against filth* (2014).

Victorian London could be portrayed as a city of difference. It was an exceptionally alluring city for individuals from everywhere the world since it offered loads of chances. Then again, the life in nineteenth century London was not just wonderful since commotion, rottenness, destitution and guiltiness spread through the city. Rustic life, then again, was more quiet and serene and individuals were nearer to one another however in a similar time provincial tenants needed to buckle down and got less cash for it.

#### **THE ARTISTIC IDEA OF NATURALISM:**

Naturalism is initially a French development that began in the last third of the nineteenth century and carried on in the early long stretches of the twentieth century (Drabble 713). It is a drawn out authenticity, and it is based experimentally. Clinical and developmental speculations of the nineteenth century impacted the style; human person and social collaborations are seen as hereditary not really settled (Ousby 708). Naturalism will not romanticize insight. All in all, naturalism is firmly associated with logical examination and perception. It notices the regular day to day existence of the lower and working classes. Documentation, for example, genuineness and precision of detail is run of the mill. Stress is given to heredity and climate in framing one's disposition. Regular laws influence human existence (Drabble 713). Charles Darwin's hypothesis of development motivated naturalistic journalists.

#### **VICTORIAN SOCIETY AND GENDER STEREOTYPES:**

Moran says in *Victorian writing and culture* (2006) that "in Victorian culture, ladies were venerated, secured and mistreated"; their faultlessness, maternal impulses and aloofness were frequently examined in writing consequently investigates the impression of ladies in the books by A. C. Doyle assuming ladies' mediocrity and guiltlessness. After investigation of the Doyle's books it appears to be that ladies in the books regularly stay 'behind the scenes', which mirrors the truth where ladies were viewed as less significant and prevailing; the majority of the characters are men. Those ladies who are referenced are frequently in an association with their work, which is generally a house cleaner worker. It relates with Doyle's books where a worker or maid is utilized in a large portion of the families. Ladies characters are all the more as often as possible talked about in the books *The Indication of the Four* (1890) and *The Hound of the Baskervilles* (1902) where they assume significant parts for the plot.

At the point when Sherlock Holmes attempts to address a case, he is generally rapidly ready to say whether it was submitted by a man or lady. The model is for example in *An Investigation in Red* (1887). Holmes rapidly notices the location of the crime and arrives at the resolution that "there has been murder done, and the killer was a man. Even however Doyle conceded being impacted by his educator at clinical school in Edinburgh, Dr. Joseph Ringer (Diniejk, victorianweb.org), I assume Doyle to have been roused likewise by Darwin. Darwin in *The Descent of Man*, and *Selection in Relation to Sex* (1871) depicts among different points likewise the contrasts between the genders. Darwin's thoughts which were centered around science as well as sexual orientation contrasts. Doyle may have assessed the Darwin's portrayal of the contrasts between the genders and based on it his person Sherlock Holmes can assume the sex of the lawbreaker.

#### **MARRIAGE AND DIVORCE IN THE NOVEL:**

Marriage was a typical demonstration in the Victorian time. In the Victorian time frame men frequently wedded moderately late in light of the fact that as Calder makes reference to in *The Victorian Home* (1977), "Victorian spouses were required to keep their wives not simply in the style to which they were acclimated, however regularly in the style which they strove for". Love frequently didn't play, for example, significant job and many working class ladies wedded for cash to keep away from the need to make money and in this way, they made an honest effort to marriage. In spite of the fact that marriage assumed a significant part and day to day life was an optimal picture for some, Victorians, Doyle doesn't utilize this theme as often as possible. At the point when he does, it normally doesn't assume a significant part for Doyle's books.

Marriage was seen as a vital demonstration among Victorians. Men were relied upon to give their ladies basically what they were acquainted with before the marriage; also, couples were normally from a similar class. It very well may be grasped in *The Indication of the Four* (1890) from Watson's predicament and trouble when Miss Morstan is going to be turned into a beneficiary; out of nowhere he is uncertain about his opportunity to be with her. Albeit more feasible at the turn of twentieth century, separate was as yet a troublesome and costly cycle for most ladies as properly depicted in *The Hound of the Baskervilles* (1902). All things considered, toward the conclusion of the Victorian age, ladies had more rights and in this way, additionally for the female person in the novel there may be some opportunity of accomplishment. In contrast to different creators of the Victorian period, Doyle doesn't depict family relations top to bottom. Then again, he depicted an ancestral everyday life and polygamy of Mormons in Utah in *A Study in Scarlet* (1887) extravagantly. The dad is

despondent and doesn't her girl permit to marry a Mormon since he says that "such marriage he viewed as no marriage by any means, yet as a disgrace and shame" (80).

**CONCLUSION:**

The 'Selected Aspects of the Victorian Era in the Works by A. C. Doyle' investigated and looked in the books by A.C. Doyle for the depiction of sexual orientation generalizations, science and innovation, metropolitan versus country life in the Victorian time. The point of the proposition was to show that the story isn't just well known investigator fiction yet in addition a solid social and authentic reflection. Besides, I attempted to discover which hints of naturalistic artistic style are conspicuous in the chosen perspectives and which highlights make the writings instrumental for the early analyst story.

The hypothetical piece of the theory summed up and talked about the picked perspectives. The down to earth part dissected how the subjects are envisioned in the books by A. C. Doyle and it likewise attempted to discover which hints of naturalistic abstract style are noticeable. the novels can give the readers a broad picture of the Victorian period, its culture, society, lifestyle and other aspects. When reading the novels, readers can also become aware of the naturalistic style. However, despite the numerous hints on the life in the Late Victorian period, the criminal plot remains the crucial and most discussed issue. The readers thus might not perceive the historical and cultural background.

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## AN AMERICAN PICTURESQUE IN MARGARET FULLER'S "SUMMER ON THE LAKES"

Ms. M. K. Nandhini

M.A., M.Phil., (English Literature), Assistant Professor, Department of English, St. Joseph's College of Arts and Science For Women, Hosur

**ABSTRACT**

*Soon after the English Civil War, as the Anglophone world started changing to a social request organized by market and money private enterprise, the word development, which prior had alluded only to rural cycles, obtained progressively allegorical implications alluding to the improvement of a person's brain, resources, and habits. This expansion of importance mirrored the advancement of new originations of property as a fundamental element of personhood that had started to adjust the meaning of subjectivity. The flow of such metaphorical implications agrees with the ascent of print culture, the improvement of an abstract open arena, and the professionalization of writing in the eighteenth century. These social improvements recommend the relative straightforwardness with which the new origination of property communicated as abstract character coincided close by different types of capital in Britain. Artistic analysis of the most recent forty years has accounted for the numerous manners by which having artistic development served the improvement of a working class economy and philosophy in eighteenth-and-nineteenth century Britain. However the metaphorical significance of development shows up all through American writing of the long nineteenth century, in this way authenticating the idea's transoceanic relocation and transformation to the socio-political environments of the New World, no huge investigations of American writing play considered the part artistic development itself plays in forming American thoughts of character. My examination starts to work with a comprehension of how current meanings of property influenced and affected early American artistic culture.*

By placing American literature of the long nineteenth century in a transatlantic context, I show how work by Margaret Fuller model the relationship between real and metaphorical cultivation at the level of both form and narrative content. I argue that within these works literary personality appears as a threat to the American character unless it directly facilitates the acquisition of real property. That in an American context figurative cultivation is at all times subordinated to real cultivation suggests a suspicion of intellectual development at the very foundations of American culture. I draw on new work in early American literature, eighteenth-century studies, British Romanticism, and on a tradition of Marxist critique to read American personality not as an exceptional and isolated development of the revolutionary era, but as a transatlantic migration of cultural forms and conceptions that adapt and mutate upon arriving on New World soil. To understand these migrations and mutations, I map the importation of European aesthetic concepts and literary sources within American productions. My readings make sense of the contradictions within the anti-literary American ideology often articulated in the content of works, whose forms nevertheless reveal a comprehensive engagement with literary history. Doing so allows me to demonstrate the complex ways in which early American authors depicted literary cultivation as either a means of acquiring real property or as a moral redress against the self-interest of a speculative economic culture.

"I have not been particularly anxious to give the geography of the scene, inasmuch as it seemed to me no route, no series of stations, but a garden interspersed with cottages, groves and flowery lawns, through which a stately river ran... What I got from the journey was the poetic impression of the country at large; it is all I have aimed to communicate."

In figuring out the organization of *Summer on the Lakes*—explicitly the creator's continuous interference of the observational realities of the excursion "with irregular affiliations or with inclusions of shamelessly superfluous matter, particularly with specially appointed beautiful flights," as one baffled peruser put it, thoughtful pundits have clung to Fuller's own detailing of her compositional system as "the graceful impression of the country at large," an assertion she makes toward the finish of the text's third section. Locking on to this implication to an unmistakably heartfelt type of reasonableness certain in her expression "graceful impression," Fuller's heroes, as a rule, endeavor their guard of the work's structure through weakened thoughts of Heartfelt feel.

Susan Belasco Smith, summarizing Lawrence Buell, for example, proposes in her prologue to *Summer on the Lakes* that the general notoriety of the movement sort in the nineteenth century was because of "the ascent of sentimentalism with its weight on person experience." Her examination stresses the significance of the seeing subject, reminiscent of the valorization of reasonableness in the eighteenth and nineteenth century, however Smith avoids recognizing the text's liking with a specific strain of Romanticism. All things being equal, she adjusts the class to sex as opposed to the acts of a particular stylish development, "*Summer on the Lakes*

follows the custom of portfolio and sketchbook composing that started at the turn of the nineteenth century and was to a great extent a work of art rehearsed by ladies." Likewise, John Matteson, Fuller's latest biographer, references Romanticism in his appraisal of the text's structure by adjusting the piece to the German scholarly culture Fuller knew so indeed, asserting that "[t]he interwoven nature of Fuller's story is expected partially to her needing to mix her book with a portion of the soul of the German Romantics. His recognizable proof and meaning of a particular Romantic tasteful or practice stays as superficial as Smith's, just validated by the case that German Romantics remain "by and large less worried about recounting consistently associated stories than they were with uncovering philosophical and mental truth." Stephen Adams in his article, "That Tidiness We Always Look for in Woman: Fuller's Summer on the Lakes and Romantic Aesthetics" because of his title seems to guarantee a more intensive commitment with tasteful hypothesis, however definitely shuns the subject through a topical perusing of the works' unique materials. Imagining "Heartfelt scholarly experimentation" as a formal abstract classification in itself, Adams argues "[p]erhaps the letters, stories, sonnets, extricates from books, and different materials apparently disconnected to the excursion don't only cushion out a generally meager account, however help control furthermore, and direct the book's shape and major themes." Flattening the meaning of the Romantic travel account as a type to "some sort of journey out and back," he bunches Summer on the Lakes with works like *The Prelude*, *Childe Harold's Pilgrimage*, "Tune of Myself," *Walden*, and *Moby-Dick*, contending that a "journey" capacities as a "free story spine" for such "Heartfelt experimentation" on the grounds that "[t]he center movements from the scene... to emotional or on the other hand internal exploration." Thus, with his topical investigation Adams never sufficiently peruses Fuller's work through the tasteful way of thinking of the eighteenth and nineteenth century. I start with these agent instances of normal clarifications of Summer on the Lakes since they show an overall basic inclination in the investigation of nineteenth-century American writing to understand European Romanticism as basically a solid late eighteenth-mid nineteenth-century abstract privileging of emotional experience. In doing as such such readings play out an extraordinary insult to Summer on the Lakes as a text, and Fuller as an creator and scholarly. They likewise jumble quite possibly the main models in American writing of a variation of an especially European origination of abstract and stylish development for the exceptionally exacting and scholarly reasons for developing another American landscape. Fuller's text double-crosses a profound agreement and commitment with the codes, shows, and speculations of the British pleasant development, a mindfulness she as of now recommends through her most fundamental authorial decision: to compose a home grown travel story as "a idyllic impression of the country at large."

Numerous pundits decipher Fuller's comprehension of American writing as "a new verse" and "new savvy growth" because of the geographic and verifiable split between the United States and Europe, as it is required to an American writing without any association to Old World scholarly practices. Smith, for example, composes that Fuller was "a main advocate of the improvement of a particularly American writing that would not be imitative or then again dreary of British traditions." Fuller's own composition, notwithstanding, never makes such discount divisions among American and European social creations, a consequence of her profound commitment with European writing. Colleen Glenney Boggs contends specifically that "interpretation empowered Fuller to characterize social way of life as a model of personhood that depends on a discourse with others in a country whose culture arises in worldwide contexts." Fuller's own words revise Boggs' attestation, zeroing in less on a model of subjectivity, than a hypothesis of social capital zeroed in on European sources. In her article "Americans in Europe" from 1847, for example, Fuller distinguishes three kinds of Americans she experienced during her time abroad as a columnist. The principal she names "the subservient American," whose fundamental premium as an European explorer is "to go through his cash and enjoy his tastes." His definitive end is to assemble sufficient European social 'accessories' to "win importance at home" "among those less travelled and as uninformed as himself."

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**BRITAIN-AFRICA RELATIONS POST BREXIT: AN EGALITARIAN APPROACH OF “GLOBAL BRITAIN”****Lopamudra Ghosh**

Student (Second Year) BA History Honors, Independent Researcher, and HundrED Youth Ambassador  
Representing India at the Finland based organization called “HundrED”  
Institutional Affiliations: University of Burdwan and HundrED, Helsinki, Finland

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**ABSTRACT**

*High-flying illusions of supporters and evil predictions on the part of critics have shown controversy around Brexit. This research examines five of the most important issues that are at great risk and determine post-Brexit relationships between Britain, the European Union (EU), and Africa. These five key issues are access to financial markets, Foreign Direct Investment (FDI), foreign aid, national and international geopolitical security, and the type of the geopolitical and economic partnership between the European Union (EU), Britain, and Africa. This analysis focuses on the alternative economic and geostrategic policies of those sub-Saharan African countries in the Commonwealth, because key aspects of their potential geostrategic and economic developments will determine the British government's success or failure in promoting the ideology of “Global Britain”. Moreover, Britain's mission of promoting the ideology of “Global Britain” relies heavily on its strengthened cooperation with the Commonwealth nations. The key researches on potential geostrategic and economic developments in these sub-Saharan African countries show that the expectations of Brexiteers and African politicians are alike with the aim to develop relations between Britain and the post-Brexit Commonwealth countries. Although the post-Brexit United Kingdom has increased the geostrategic, political, and investment opportunities for African countries in terms of providing more preferable trading partners, there is still doubt as to whether London can donate something unique and new that other global geopolitical players around the world such as China, the United States of America (USA), Australia, India, South Korea, and Japan having their own growing geopolitical and economic interests in Africa, did not already accomplish in their previous geostrategic and economic pursuits.*

*Keywords: Africa, Brexit, Britain, European Union, Financial Markets, Foreign Aid, Foreign Direct Investment (FDI).*

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**1. INTRODUCTION**

Controversial discussions about the potential consequences of Brexit highlight the future geostrategic and economic impacts of the withdrawal of the United Kingdom (UK) from the European Union (EU) at the end of March 2019. These discussions also focus on the potential geostrategic, political and economic impacts of Brexit on Africa and are always characterized by high flying illusions on the part of the supporters as well as disagreeable predictions from the ones who are sceptical about Brexit. Five years ago, shortly after the pro-Brexit vote of June 2016, Ansorg and Haastrup (2016) published a highly influential research overview and analysis of the major problems that could risk African economy and geopolitics, which was also supplemented by an exhaustive study on the impact of Brexit on African Commonwealth countries. The study was completed in October of the same year (Langan 2016). Subsequently, additional studies have been completed and have also revived this image of Brexit, including the most exhaustive and comprehensive report from the European Centre for Development Policy Management (Bilal and Woolfrey 2018). This research is a geopolitical, geostrategic, and economic evaluation that analyses and summarizes these studies in light of the new developments in sub-Saharan Africa post-Brexit. Looking at the highly controversial Brexit policy and the fact that neither a “no deal” hard Brexit nor a “second referendum” soft Brexit can be easily ignored (Bellamy 2018; Kettle 2018), some of the conclusions presented in this research will necessarily remain consistent and tentative.

**2. GEOPOLITICAL, GEOSTRATEGIC, AND ECONOMIC IMPACTS OF BREXIT: KEY ISSUES AT STAKE FOR AFRICAN COMMONWEALTH COUNTRIES**

Drastically different perspectives on the potential geopolitical, geostrategic, and economic impacts of Brexit on the African Commonwealth countries have shaped the recent controversial debates between current scholars (Bilal and Woolfrey 2018). Brexit could create more resistance, resilience, tensions, and ambiguity, but it has also showed its capabilities to generate new opportunities and investments for the sub-Saharan African countries and the African Commonwealth countries. But what exactly are the issues that stake economic growth in post-Brexit Africa? In the following research, I focus on five issues that could have a significant impact on the sustainable cooperation between the United Kingdom and Africa and the European Union and Africa. These five key issues are market access, Foreign Direct Investment (FDI), foreign aid, geopolitical security and

economic partnership. This review of potential geopolitical, geostrategic, and economic developments and challenges focuses on the 19 Commonwealth provinces of sub-Saharan Africa including heavyweights such as South Africa, Nigeria, Kenya, Egypt, and Ghana. This is so because the British government's vision of promoting the ideology of "Global Britain" relies heavily on strengthened and reinforced cooperation and partnerships with the Commonwealth nations.

- i. African Commonwealth Nations will have Improved Access to International and Global Financial Markets:** For most of the African countries in the Commonwealth and in sub-Saharan Africa, Britain has been by far the largest international market for their exports. According to the British Parliament, the post-Brexit free trade policy and liberalized economy should boost trade prospects in the African economy (RAS-APPG 2017). It is somewhat likely that most of the Anglophone governments in sub-Saharan Africa will try to negotiate or even withdraw from anti-EU trade agreements following Brexit. Tanzania, for instance, has already rejected the proposed Economic Partnership Agreement (EPA) between Brussels and the East African Community (EAC) countries, citing the "economic turmoil" that engulfed the European Union following the Brexit vote and the twisted terms of the Brexit agreement (Gutteridge 2016). The Dar es Salaam government announced in February 2017 that it would not sign an EAC-EPA until it had conducted a thorough study of the current situation, especially with regard to issues such as the geostrategic, geopolitical, and economic impacts of Brexit (Gutteridge 2016). The government in the United Kingdom currently says that it will protect the newly established African industries with its post-Brexit trading policy followed by economic liberalization, which must stand in stark contrast to the EU's EPAs (RAS-APPG 2017). However, in the case of a "no deal" or hard Brexit, African countries in the Commonwealth will no longer be able to enjoy preferential access to the United Kingdom if the British government fails to negotiate new bilateral agreements with the African Commonwealth governments ahead of time. Due to the limited time remaining before March 2019, this then seemed rather unlikely. The government's economic policy of exclusion from the preferential access to the free market economy of the United Kingdom is not only valid for the signatories of the EPAs, but also for those involved in the EU's free trade agreement and the EU's general economic preference program, including the duty-free and quota-free market access under the "Everything but Arms" initiative that was started by the European Union. Serious and adverse geopolitical, geostrategic, and economic side effects are predicted for countries such as South Africa, Nigeria, Egypt, Kenya, and Mauritius, because of the fact that approximately the UK accounts for about 25 to 30 percent of their exports to the European Union. These geopolitical, geostrategic, and economic side effects will be exacerbated if the economy of the United Kingdom suffers a drastic recession followed by inflation as a result of the Brexit deal (Bilal 2016; Ansorg and Haastrup 2016). Moreover, within the rest of the European Union, African Commonwealth countries in the sub-Saharan Africa will no longer depend on the United Kingdom as an economic mediator and geostrategic advocate. This could lead to a strong tendency towards supporting the Francophone and Lusophone prejudice in the European Union's trade relations with the African Commonwealth countries at the expense of the African countries located in sub-Saharan Africa (Bishop and Clegg 2018: 5). On the other hand, the European Union is unlikely and unwilling to reconsider EPAs in the near future in order to adapt them with the Brexit agreement. Last but not the least, there is still doubt whether the United Kingdom by itself can compete more effectively with other trade interests and key geopolitical players such as China, India, USA, South Korea, Australia, and Japan, as compared to the EU's cooperation in the global economic competition for Africa's resources.
- ii. Increased Foreign Direct Investment (FDI) at the stake of the African Commonwealth Countries in the sub-Saharan Africa:** During the G20 Summit in Hamburg in July 2017, the British Prime Minister Theresa May announced comprehensive and easy to execute post-Brexit plans that were aimed to reduce the African Commonwealth countries' geostrategic, geopolitical, and economic dependence on foreign aid (Little 2018). The British government aims to boost Africa's long-term geostrategic, geopolitical, and economic prosperity through integrated trade programs such as the "Aid for Trade" (OECD 2017), financial instruments (see section 4), and the promotion of more and more Foreign Direct Investment (FDI) in African Commonwealth countries located in the sub-Saharan African region (UK Government 2017). The total amount of United Kingdom's trade and economic investments in Africa that doubled between 2005 to 2014 from GBP 20.8 billion to GBP 42.5 billion, were supposed to have been enhanced by the Brexit deal. Among all other African Commonwealth countries in the sub-Saharan African region, South Africa is the most likely to remain a major recipient of the Foreign Direct Investment (FDI) provided by the government of the United Kingdom (Vines 2018: 122-123). It had already accounted for approximately 29.8 percent of the United Kingdom's total (outward) Foreign Direct Investment (FDI) in the entire

African continent in the year of 2014 (Hardie 2016). Industry, mining, and financial services were the largest employment generating sectors in the South African economy that had received enormous amounts of the British government's Foreign Direct Investment (FDI), with the first two accounting for 54.4 per cent and 34.3 per cent of the total UK FDI in Africa in 2014 respectively (Hardie 2016). However, a British accounting company expects Britain's post-Brexit Foreign Direct Investment (FDI) to go down and decrease drastically as compared to the UK FDI that could have increased if there would be no Brexit deal (Vines 2018: 123). As a complement to the expansion of FDI, Prime Minister Theresa May also announced at the G20 Summit in Hamburg that the British government would seek to increase the integration of African countries into global financial markets after Brexit. Among other things, the British government promised to contribute GBP 60 million to building a strong and transparent African financial market (UK Government 2017). According to Theresa May's rather exaggerated announcement, the UK will seek to promote new financial systems, improve the independence of the African banking sector, and allocate financial resources where they are the most needed. Besides restoring the role of the privately financed sectors of the UK economy within the framework of the British economic development strategy as a "hallmark of building Global Britain" (DFID 2017), the British government has also aimed to use the unique role of the publicly financed sectors of the British economy to expand its financial markets (Price 2018b). Therefore, the former Prime Minister Theresa May gifted her African peers a strong geostrategic, geopolitical, and economic partnership with the "City of London" so that the city could become a financial hub for Africa and could also compete with other former colonial powers. This was achieved by moving and liquidating private funds to former colonial countries in Africa and elsewhere.

### **3. BRITAIN-AFRICA RELATIONS POST BREXIT: GLOBAL BRITAIN'S INCREASED FOREIGN AID FOR THE AFRICAN COMMONWEALTH COUNTRIES IN SUB-SAHARAN AFRICA**

The British government's views and opinions on the future of foreign aid and geostrategic aid between the UK and Africa in the aftermath of Brexit are largely hampered by Britain's trade and financial policies. This applies especially to London's focus on "aid for trade", "trade, not aid" economic policy leading to the development of the private sector as described above. Although Prime Minister Boris Johnson has repeatedly stated in 2019 and 2020 to reaffirm the British government's commitment of spending 0.7 percent of Gross National Income (GNI) on foreign aid (enacted in 2019, see Heppell, Crines, and Jeffery 2020), it is possible that Brexit could lead to a decline in UK aid to Africa, for the following reasons.

- i. Mismanagement of Foreign Aid has led to the Growth of Anti-Aid Sentiment in the United Kingdom:** Intensifying the scandal within Oxfam and other development NGOs, anti-aid sentiment in Britain has grown in recent years, and unsuccessful allegations regarding mismanagement of foreign aid have been raised as complaints. In addition, divorce from the EU will deprive the UK of many repetitive and substantial consequences that might have multiplied UK's foreign aid in terms of assistance for African countries (Price 2018a). In fact, the British government had already stated in 2013 that the EU's collaborative economic provisions provide the "magnitude and reach of EU's financial instruments" including the European Development Fund (EDF) which is the EU's key financial instrument for providing development assistance to African, Caribbean and Pacific Group of States (ACP) – to "outweigh those the UK could bilaterally bring more friendly economic policies" (UK Government 2013, quoted in Price 2018a: 3). This has allowed the UK to focus on "scarce national resources on priorities elsewhere" in periods of tightness and insecurity (UK Government 2013, quoted in Price 2018a: 3). Thus, the British government apparently envisioned the EU as its very own catalyst that can help the UK to improve its aid. Given this, Britain's determination to keep its promises of aid can be greatly reduced.
- ii. Depreciation of the United Kingdom's Currency:** Another reason for the decline in aid would be the reduction of the value of the UK's national currency, i.e., the Pound Sterling or Great Britain Pound (GBP). This has resulted in creating a negative impact on the value of British foreign aid in Africa and elsewhere. This could be further exacerbated by a possible depreciation of the British Gross National Income (GNI) as a direct or indirect consequence of Brexit. Given the forecasts predicting relatively slower economic growth in the UK, this raises questions about the UK government's ability to fulfil its aid commitments (Bishop and Clegg 2018: 5). In addition, the British government may be allured to utilize the funding from scarce resources for domestic use in response to pressure from popular politicians (Ansorg and Haastrup 2016; Price 2018a).
- iii. Strengthened Focus on Bilateral Cooperation and Partnerships within the European Union:** The British government could focus on bilateral cooperation by contributing its funds and foreign aid to the

many international development and cooperation initiatives established by the United Nations and the European Union. These programs include the United Nations Development Program (UNDP); United Nations International Children's Emergency Fund (UNICEF); United Nations Volunteers; World Health Organization (WHO); United Nations Environment Program (UNEP); World Bank, including the International Development Association (IDA); International Monetary Fund (IMF); and the Global Fund to Fight AIDS, Tuberculosis and Malaria. The Brexit has resulted in a drastic decline in UK's foreign aid that could be further exacerbated by a reduction in the EU's overall development assistance, given the UK's leading role as one of the largest contributors to the EU aid budget and as the staunch advocate of 0.7 percent target for foreign aid within the EU (Ansorg and Haastrup 2016).

#### **4. BRITAIN-AFRICA RELATIONS POST BREXIT: AUGMENTATION AND STRENGTHENING OF THE GEOPOLITICAL, GEOSTRATEGIC, AND ECONOMIC SECURITY FOR THE AFRICAN COMMONWEALTH COUNTRIES:**

The European Union still plays a key role in African Peace and Security Architecture (APSA) and the African Peace Facility (APF) (Ansorg and Haastrup 2016). The African Peace Facility (APF) is a key supporter of the European Union. Since the year of 2004, the total amount of foreign aid provided by the European Union is equivalent to more than EUR 2.7 billion with the objective of augmenting and strengthening the efforts of the African Union and the African Regional Economic Communities which are established to sustain regional peace and security in the African continent (EC 2018).

The Peace Fund aims to provide the necessary financial resources to APSA for its proper operationalization. A total of USD 25 million was disbursed by the Peace Fund in 2017. Through this organization of the European Union, Britain, which bilaterally contributed only 3 percent to APSA in 2014, was also able to contribute continentally rather than just bilaterally to the African peace and security programs. Britain made this possible by utilizing the multiplier effect of the EU's 75 per cent APSA funding in its own interest (Nathan et al. 2015). Thus, the support for the British bilateral funding was much lower than that for the German bilateral funding which was four times greater. Germany accounted for approximately 12 percent of the total bilateral and continental funding for the APSA.

The British government has repeatedly stated that its defense costs are the largest in the EU, and that it has the largest defense industry. Moreover, the UK government has also added that it has frequently participated in many of the EU Common Security and Defense Policy (CSDP) programs (Duke 2018: 44). However, Britain has apparently exaggerated its deliberate strategies to improve its position for negotiating a new post-Brexit economic and security cooperation with the EU, which will include defense, cyber security, and foreign migration issues (Duke 2018: 44-45).

According to the data from the European University Institute, Britain has provided only 2.3 percent of the cost of all CSDP missions, and only 4.3 percent foreign aid to those missions in which it has deliberately taken part (Duke 2018: 44-45). This is much smaller, for example, as compared to France, Spain, or Italy's contributions to civilian and military service. In addition, the UK did not participate in many of the civil and military operations in Africa, other than the mission at the Horn of Africa which was intended to protect the sea routes from Europe to Asia. Instead, France took the lead in almost all of these civil and military operations.

#### **5. BRITAIN-AFRICA RELATIONS POST BREXIT: GLOBAL BRITAIN'S EGALITARIAN APPROACH FOR ESTABLISHING COLLECTIVE CLIENTELISM**

Some Brexiteers and African politicians have expressed their hope for the golden age characterized by a revitalized but deep-seated relationship similar to the post-Brexit Commonwealth relationship. African governments are planning to utilize their negotiation advantages and are developing their global image as much-needed partners for safeguarding African domestic markets and infant industries (Westcott 2018). This strategy could work in areas where British products and services do not compete with African markets. However, it is still doubtful whether the UK will allow strong tax rates and non-tax barriers to trade, flexible economic, trade, and investment laws, or greater protection against British service exports if the British service and exports industry is adversely affected.

In addition, a more liberal economic attitude on the part of Britain with regard to African imports – for example, in terms of rates and other tax-free barriers – could increase the cost of future trade agreements between the UK and the EU, especially post-Brexit. Although the British government is proud of its strong bilateral ties with the Commonwealth network, these relations, especially with the key players of Africa, viz., South Africa, Nigeria, Ghana, and Kenya, did not exist without controversy – for example, the controversies concerning brain drain from the former British colonies to the UK.

Finally, because of post-Brexit economic consequences, it is unlikely that new and better deals between Britain and Africa and the EU and Africa can be renegotiated and formulated. This is so because the UK and the EU will focus first on the world's most important trading partners and competitors as they re-examine their relations with the geopolitical world (Westcott 2018).

Under these conditions, an equitable partnership between the UK and Africa is impossible because it may lead to a win-win situation on both sides. In addition, Brexit will not only challenge European integration but will also put African regional integration efforts at risk (Ansorg and Haastrup 2016; Henkel 2017: 70).

African regional trade is adversely affected due to the fragmentation of regional organizations with competing agendas. The EU's past experience in negotiating with EPAs has proven to be a daunting task that has failed to integrate incomplete African regional projects. There is no doubt that Britain will be very successful in this regard. However, if Britain repeats the existing patchwork of EPAs and other EU trade arrangements across Africa instead of seeking a continental solution, this is likely to add to the existing barriers to intra-continental free trade agreements (Murray-Evans 2017).

The same applies to the recent African Continental Free Trade Area (ACFTA) initiative (Ezeani 2018). The most common strategy for many of the least developed African countries, especially small ones, is to induce patronage or "collective clientelism" (Ravenhill 1985: 3, 43; Price 2018a). Collective clientelism is meant to negotiate non-commercial issues, such as voting behavior at the UN or other separate assets, in order to achieve better market access and economic protection. Thus, governments, especially those of the sub-Saharan African countries, may go back to the traditional policies that they initially used to effectively destroy international economic players during the Cold War.

## 6. CONCLUSION

On 28<sup>th</sup> August 2018, Prime Minister Theresa May began her third trip to Africa to build new trade relations with key nations ahead of Brexit. During her travels to South Africa, Nigeria, and Kenya, she highlighted the great opportunities presented by the British post-Brexit policy. She introduced plans to seek prominence that are supposed to strengthen Brexit's strong momentum for British firms and investors and promised to turn Britain into a global nation that does business globally with growing powers to promote global economic growth. On the second day of the trip, during her visit to Nigeria, she presented a proposal to build the first UK-Africa FinTech Partnership in Lagos.

At the first glance, these developments seem to support hope regarding post-Brexit relations between the UK and African Commonwealth nations. In view of the long-running and successful Chinese economic invasion of Africa, however, it remains doubtful that London could offer anything new as compared to other countries with a growing interest in Africa, because such countries already have similar plans in their agenda. African leaders are in a good position to choose: a developed partnership with China, a major EU bloc, a potential US resource, or a historically linked UK.

Most likely, African countries will play as each other's economic and geopolitical partners by choosing the best for their customers. By doing so, they will be well aware of the unique economical and geopolitical value of each trading partner, a consideration that will not favor the UK given the strong negotiating position of the major competitors.

In 2015, total trade (imports and exports included) between Africa and the UK amounted to \$ 36 billion (GBP 28 billion), but EU-Africa trade was USD 305 billion and China-Africa traded USD 188 billion (Madowo 2018). Despite its historical ties with many countries on the continent, the UK may therefore not be the first choice for African countries due to its declining competition in terms of trade volume.

Time is running out in the United Kingdom. London has recently begun to introduce legislation aimed at ensuring that African businesses will have access to the UK market on the same terms as they currently do under various trade regimes (Madowo 2018).

Finally, the issue of migration, which is closely linked to the Brexit vote, will not disappear with Britain's withdrawal from the EU. Reconstruction of economic incentives for interests and reconciliation, within the framework of international humanitarian aid, will be one of the major themes of post-Brexit relations between Britain, the EU, and Africa (Collier 2018; Baldwin, Collier, and Venables 2017).

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**TO ASSESS AWARENESS AND STRESS LEVEL REGARDING COVID-19 PANDEMIC AMONG BANKER**

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**Prof. Archana Maurya<sup>1</sup>, Ms. Vishakha Meshram<sup>2</sup>, Ms. Khushboo Mungle<sup>3</sup>, Mr. Viwek Nade<sup>4</sup> and Ms. Payal Nanotkar<sup>5</sup>**

Professor of Department of Pediatric Nursing <sup>1</sup>, B.Bsc.Nursing Final Year<sup>2,3,4,5</sup>, Smt. Radhikabai Meghe Memorial College of Nursing, Datta Meghe Instituted of Medical Sciences (Deemed to be University), Sawangi (Meghe), Wardha

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**BACKGROUND OF STUDY:**

*The WHO has designated the outbreak as a global epidemic, requiring country to tighten its statewide lockdown in order to prevent the illness from spreading and to put an end to the outbreak in its several states. This study is designed to establish how many bankers are aware of the Corona Virus. Most of people are sensitive to fear of sickness or death, feeling hopeless, and being stereotype at the group level, just as they are at the individual level<sup>1</sup> the epidemic has a negative effect on public mental health, perhaps leading to psychiatric crises.<sup>2</sup>*

*Objectives: To assess the awareness and stress level regarding covid-19 pandemic among bankers.*

*Material and method: An Descriptive research design study was undertaken to assess awareness and stress level regarding covid-19 pandemic among bankers. In this study the total number of 100 who fulfill the inclusion criteria were selected banks in Wardha city. The study was non-probability convenient sampling technique used and the tool was the structured questionnaires on awareness of covid-19 and also modify PSS scale. The data gathering process began based on the objectives and the hypothesis the data was statistically analyzed with various tests such as descriptive statistics and inferential statistics.*

*Results: This study is planned to assess to assess awareness and stress level in bankers regarding covid-19 pandemic. The result is shows that the awareness of bankers, 6% of bankers had average, 83% of bankers had good and 11% of bankers had excellent level of awareness level. Minimum awareness score was 6 and maximum awareness score was 18. Mean awareness score was  $13.51 \pm 2.01$  and mean percentage of awareness score was  $68.55 \pm 10.08$ . The stress level of banker's shows that 7% of bankers had moderate stress, 80% had severe and 13% of bankers had extreme stress. Minimum stress score was 22 and maximum stress score was 65. Mean stress score was  $37.59 \pm 10.50$  and mean percentage of stress score was  $59.48 \pm 12.75$*

*Conclusion: To assess overall awareness and stress level in bankers regarding covid-19 pandemic. We conducted a survey with a representative sample of the Wardha city. Our research study concluded that the bankers have good knowledge related to covid-19 and suffer from high level of stress. One sensible option is to give expert counselling to reduce this unnecessary stress. We recommend that deep breathing exercise, meditation, yoga can also help people to eliminate stress.*

*Keywords: Awareness, stress level, banker, covid-19, pandemic.*

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**INTRODUCTION:**

In December of this year in Chinese Wuhan the new coronavirus disease 2019 (COVID-2019) was first appeared (Hubei province).<sup>3</sup> The disease induced by the Severe Acute Respiratory Syndrome Corona virus (COVID 19) (SARS-CoV-2) and quickly spreading over the world. By 4 August 2020, the WHO received reports with 697,222 deaths of 18,446,766 declared COVID-19 cases.<sup>4</sup>

The most frequent signs of this infection are fever, myalgia, tiredness and dry secretions. The additional symptoms listed include shivering, coryza, throat infection, diarrhea, nausea and vomiting<sup>5</sup> these droplets can be inhaled by close individuals or fall over items and surfaces that someone else can contact and infect your nostrils, eyes and mouth.<sup>6</sup> These symptoms are usually moderate and there are no indications or symptoms for some infected people.<sup>7</sup>

The working conditions have likewise significantly changed, a lot of people temporarily or permanently lost their work, Many people online work from home, sometimes inadequately and those who work in important areas seem to face excessive workloads, increased stress levels and increased anxiety.<sup>8</sup>

In India more than 2, 63,580 confirmed cases have been reported in India. Approximately 3.4 percent of COVID-19 cases recorded worldwide have resulted in death. In the absence of efficient medications and immunizations, lockdown and social isolation are regarded to be the only viable preventative measures.<sup>9</sup>

This pandemic also causing a major worldwide economic crisis (Thunström et al. 2020), with a severe psychological impact and a wide variety of emotional depression and mental conditions including mental stress, depressed and worries.<sup>10</sup> It has been discovered that 98 percent of state-owned bank transactions are not digital, despite the fact that 99 percent of the country's banking is done through branches, 27%. As a result, throughout this period of lockdown, banks are kept open.<sup>11</sup>

**Method:** Non-experimental descriptive research approach was selected for this study. The study was conducted in banks of wardha city. The population of the study was bankers of wardha city. Sample size was N= 100. 100 employees were selected by using a non-probability convenient sampling technique. This study included those who are bankers and permanent bankers present at the time of the study. The demographic performs structured questionnaires on awareness of covid-19 and also modify PSS scale with a formal teaching program in this research.

The investigator obtained permission from the concerned authorities of Smt. Radhikabai Memorial College of Nursing and the banks in Wardha city respectively. Informed consent is taken from the participants. The subject is requested to complete the tool after assuring confidentiality of the information. Consent is obtained from the subject. Explained what is the need and purpose behind conducting the research. The participant's actively participated data got collected and finally the investigator thanked all of the research samples as well as the authorities for their assistance after the data collection process was completed.

### Result:

The findings are organized and presented in four parts as shown below:

#### SECTION A: DISTRIBUTION OF BANKERS WITH REGARDS TO DEMOGRAPHIC VARIABLES.

This section deals with percentage wise distribution of bankers with related to their demographic variables. An appropriate sample of 100 subjects was given from the study population, who were from selected banks of the city. The data gathered to describe the sample characteristics including (age, gender, marital status, education, type of bank, years of experience, and designation respectively).

n=100

Demographic Variables	No. of Bankers	Percentage (%)
<b>Age in years</b>		
20-30 yrs	29	29
31-40 yrs	47	47
41-50 yrs	24	24
51-60 yrs	0	0
<b>Gender</b>		
Male	68	68
Female	32	32
<b>Marital Status</b>		
Married	72	72
Unmarried	22	22
Divorced	4	4
Separated	2	2
<b>Qualification</b>		
SSC	5	5
HSC	9	9
Under graduation	46	46
Post-Graduation	38	38
Other	2	2
<b>Type of bank</b>		
Nationalized Bank	44	44
Private Sector Bank	45	45
Co-operative Bank	11	11
Other	0	0
<b>Years of experience</b>		
<5 yrs	29	29
5-15 yrs	43	43

16-25 yrs	19	19
26-35 yrs	9	9
36-40 yrs	0	0
>40yrs	0	0
<b>Designation</b>		
Manager	10	10
Employee	56	56
Clerk	10	10
Cashier	14	14
Peon	10	10
<b>Type of employment</b>		
Permanent	65	65
Temporary	34	34
Ad hoc	0	0
Other	1	1

**Table 4.1: Percentage wise distribution of Bankers according to their demographic characteristics**

**SECTION B: ASSESSMENT OF LEVEL OF AWARENESS AND STRESS LEVEL REGARDING COVID-19 PANDEMIC AMONG BANKERS**

This section deals with the assessment of level of awareness and stress level regarding COVID-19 pandemic among bankers. The level of awareness is divided in the headings of poor, average, good and excellent and level of stress is divided in the headings of no stress, mild stress, moderate, severe and extreme stress respectively.

n=100

Level of Awareness	Score Range	Level of Awareness	
		No of Bankers	Percentage
Poor	0-5	0	0
Average	6-10	6	6
Good	11-15	83	83
Excellent	16-20	11	11
Minimum score		6	
Maximum score		18	
Mean awareness score		13.51 ± 2.01	
Mean % awareness score		68.55 ± 10.08	

**Table 4.2: Assessment with level of Awareness**

The above table shows that 6% of bankers had average level of awareness, 83% had good and 11% of bankers had excellent level of awareness level. Minimum awareness score was 6 and maximum awareness score was 18. Mean awareness score was 13.51±2.01 and mean percentage of awareness score was 68.55.

n=100

Level of Stress	Score Range	Level of Stress	
		No of Bankers	Percentage
No Stress	0	0	0
Mild Stress	0-13	0	0
Moderate Stress	14-26	7	7
Severe Stress	27-40	80	80
Extreme Stress	>40	13	13
Minimum score		22	
Maximum score		65	
Mean stress score		37.59 ± 10.50	
Mean % stress score		59.48 ± 12.75	

**Table 4.3: Assessment with level of Stress**

The above table shows that 7% of bankers had moderate stress, 80% had severe and 13% of bankers had extreme stress. Minimum stress score was 22 and maximum stress score was 65. Mean stress score was  $37.59 \pm 10.50$  and mean percentage of stress score was  $59.48 \pm 12.75$ .

**SECTION C: CORRELATION BETWEEN AWARENESS AND STRESS LEVEL REGARDING COVID-19 PANDEMIC AMONG BANKERS**

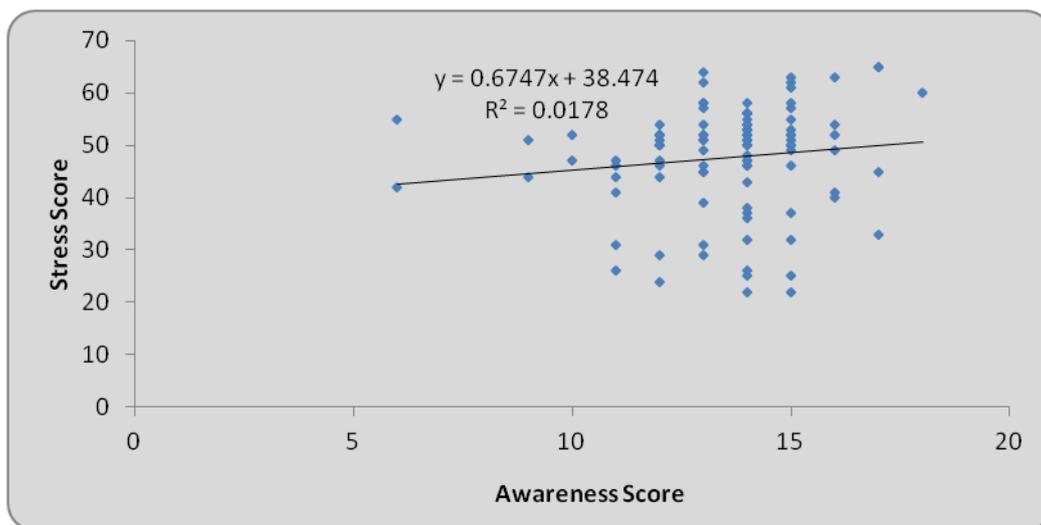
This section deals with the correlation between awareness and stress level regarding COVID-10 pandemic among bankers. The hypothesis is tested statistically with correlation between awareness and stress level regarding COVID-19 pandemic among bankers. Significance of difference at 5% of significance of level is tested by student’s unpaired (t) test and tabulated (t) value is correlated with calculated (t) value. Also the calculated (p) values are correlated with acceptable (p) value i.e. 0.05.

n=100

Overall	Mean	SD	t-value	p-value
Awareness	13.51	2.01	0.13	0.18
Stress	47.59	10.20		NS, $p > 0.05$

**Table 4.4: Correlation between awareness and stress level regarding COVID-19 pandemic among bankers**

This table shows the correlation between awareness and stress level regarding COVID-19 pandemic among bankers. Awareness and stress score are compared and Pearson’s correlation coefficient is applied at 5% level of significance. Positive correlation was found between awareness and stress score. Thus the  $H_1$  is accepted.



**Graph 4.9: Correlation between awareness and stress level regarding COVID-19 pandemic among bankers**

**SECTION D.1: ASSOCIATION OF LEVEL OF AWARENESS AMONG BANKERS REGARDING COVID-19 PANDEMIC IN RELATION TO DEMOGRAPHIC VARIABLES**

This section shows that the association of awareness among bankers regarding covid-19 score with demographic variables. All demographic variables which are correlated with awareness of covid-19 in bankers, is greater than the calculated (F) value at 5% significance of level. Also the calculated (p) value is greater than the acceptable significance of level i.e. (p) =0.05 Therefore, it i represent that demographic variables such as age, gender, marital status, qualification level, type of bank, years of experience, designation and type of employment is statistically not associated with the awareness score.

**SECTION D.2: ASSOCIATION OF LEVEL OF STRESS AMONG BANKERS REGARDING COVID-19 PANDEMIC INRELATION TO DEMOGRAPHIC VARIABLES**

n=100

Designation	No. of bankers	Mean stress score and SD	F-value	p-value
Manager	10	$55 \pm 6.41$	5.27	0.0001
Employee	56	$44.80 \pm 9.76$		S, $p < 0.05$

Clerk	10	49±9.92		
Cashier	14	45.92±11.34		
Peon	10	56.70±5.41		

**Table 4.19: Association of level of stress regarding COVID-19 pandemic among Bankers in relation to designation**

This table shows the association of stress score with designation of Bankers. The tabulated (F) values was 2.46(df=4, 95) is less than the calculated (F) i.e. 5.27 at 5% level of significance. Also the calculated (p) =0.0001 is less than the acceptable level of significance i.e. (p) =0.05. Therefore, it represent that designation of Bankers is statistically associated to heir stress score.

n=100

Type of employment	No. of bankers	Mean stress score and SD	F-value	p-value
Permanent	65	44.53±9.87	17.51	0.0001 S, p<0.05
Temporary	34	54.17±6.35		
Ad hoc	0	0±0		
Other	1	22±0		

**Table 4.20: Association of level of stress regarding COVID-19 pandemic among Bankers in relation to type of employment**

This table shows the association of stress score with type of employment of Bankers. The tabulated (F) values was 3.09(df=2, 97) is less than the calculated (F) i.e. 17.51 at 5% level of significance. Also the calculated (p) =0.0001 is less than the acceptable significance of level i.e. (p) =0.05. Therefore, it represent that type of employment of Bankers is statistically associated to their stress score.

**DISCURSION:**

The present study was the cross sectional study carried out in wardha city among 100 participant from banks employees in banks were include in the study.

Findings are discussed based on the objectives of the study. This section looks at determining, the awareness and level of stress among bankers with covid-19. The awareness is divided by the heading poor, average, good and excellent. And also the stress level is divided by the heading No stress, mild stress, moderate stress, sever stress and extreme stress respectively. The level of awareness shows that 6% of bankers had average level of awareness, 83% is good and 11% of bankers had excellent level of awareness level. The level of stress shows that 7% of bankers had moderate stress, 80% had severe and 13% of bankers had extreme stress.

This section deals with the correlation between awareness and stress level regarding COVID-10 pandemic among bankers. Positive correlation was found between awareness and stress score. In our study, the stepwise multiple regression analysis shows that the association between awareness and stress level among bankers regarding covid-19 score with demographic variables. The association between level of awareness, it represent that all demographic variables such as age, gender, marital status, qualification level, type of bank, years of experience are statistically not associated with their level of awareness score. In level of stress scores the designation (p=0.0001) and type of employment (p=0-0001) are statistically associated with their level of stress score.

**CONCLUSION:**

After the detailed analysis, this study leads to the following conclusion that:

This thesis leads to the following the conclusion, after the detailed analysis this section looks at determining, the researcher performed cross-sectional study on a topic, to assess the awareness and stress level among bankers regarding covid-19.

The bankers have good knowledge related to covid-19 and suffer from high level of stress. One sensible option is to give expert counselling to reduce this unnecessary stress. We recommend that deep breathing exercise, meditation, yoga can also help people to eliminate stress. Hence based on the above cited findings, it is clear that the stress level regarding covid-19 among bankers are associated the relations to demographic variables.

**DELIMITATION:**

Study is limited to banks employees in banks of Wardha city.

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**ASSESS THE ATTITUDE RELATED ONLINE LEARNING AMONG MID SCHOOL STUDENTS****Darshana Kumari<sup>1</sup>, Swity Besekar<sup>2</sup>, Karishma Wadsariya<sup>3</sup>, Minal Ughade<sup>4</sup>, Aditya Utkhede<sup>5</sup> and Pranay Wankhede<sup>6</sup>**

<sup>1</sup> Assistant professor, Department of Child Health Nursing, <sup>2</sup>Clinical Instructor, <sup>3,4,5,6</sup> B.BSc Nursing, Smt. Radhikabai Meghe Memorial College of Nursing, Sawangi (Meghe), Wardha, Datta Meghe Institute of Medical Sciences (Deemed to be University) Maharashtra, India.

**ABSTRACT**

**BACKGROUND:** Due to the extreme COVID-19 outbreak, education has changed remarkably. Schools and colleges were immediately closed and converted to a digital platform so that education could continue. The aim of this study was to look into the attitude of middle school students in online courses, as well as their expected results. The mid school students are facing tremendous problem regarding various subjects during online classes. There have been few studies including middle school students, despite the fact that this form of education has been found to be beneficial for older children. If the trend of younger students learning online continues, it will become a major element of middle school tutoring, demanding greater study in this area. We know how important it is to be educated in this era, but in this difficult time, everyone is doing their best to acquire new skills, and it's getting easier to enroll in online classes and finish their academic sessions. **OBJECTIVE:** 1. To assess the attitude of online classes among students. 2. To find the attitude associated with demographic variables. **METHODS:** This study was based on a Quantitative research approach. Convenient sampling technique was used. The population was all mid-school students from selected school area consisted of 200 samples. And there was structured attitude scale. **RESULT:** The study show that there is a high (positive) attitude of students towards the online classes

**KEYWORD:** Attitude, mid school students, online learning, classes.

**INTRODUCTION:**

Due to the extreme COVID-19 outbreak, education has changed remarkably. Schools and colleges were immediately closed and converted to a digital platform so that education could continue. We also know how important it is to be educated in this era, and learning new things and using new technology is a part of today's world.

The country was in the midst of a serious crisis in every sector as a result of the COVID-19 breakout across the globe. The worst-hit sectors were the education sector, the students who study in Zila Parishad schools or government schools from rural areas and who belong to the poor family have faced lots of problems as they won't get many facilities like the electronic gadgets. During the lockdown, the students were facing a big loss in their co-curriculum activities and academics due to a lack of resources. Also, the online classes were organized but the students were unable to cope up with new techniques of learning which were self-study in mid schools. The students' attitudes are changes with the situation and specially tremendous variation are seen in their attitude regarding educational system specially with online classes.

As the world changes, so does the educational system, which has altered and transformed its approach. We are aware that educational apps were launched in the past, but they were not free, but owing to the current situation, education is becoming easier and free to attain a certain aim. According to Nichols (2003: 01), online learning is a collection of integrations of different kinds of technology aimed only at promoting education. Online learning is a broad term that contains a wide range of online learning methods which render more use digital information and communication technology (ICT)<sup>1</sup>

For middle school students, online learning has taken the lead, and it is now finding its way into high schools. There have been few studies including middle school students, despite the fact that this form of education has been found to be beneficial for older children. If the trend of younger students learning online continues, it will become a major element of middle school tutoring, demanding greater study in this area.

The benefits and drawbacks of online learning have been established. Individualized pacing, electronic resources, and the ability to receive fast or personalized feedback are all positive features. While the disadvantages are related to increased student responsibilities and technological abilities, the positive aspects are related to increased student responsibilities and technological abilities.<sup>2</sup>

**OBJECTIVES OF THE STUDY:**

1. To assess the attitude of online classes among students.

2.To find the attitude associated with demographic variables.

#### MATERIAL AND METHOD OF THE STUDY:

In present study quantitative research approach was used and research design was descriptive. Sampling technique was non probability convenient sampling. Sample was selected from School of Scholars, Sawangi(M) and New English Highschool, Wardha. Study population was mid school students and sample was 200.

#### Research Variable:

- Attitude regarding online learning classes.

#### Demographic variable:

In this study the demographic variable are age, gender, grades, Area of residence, type of family, education of father, education of mother, occupation of father, occupation of mother and duration of online classes.

**Tool:** Structured attitude scale.

#### SAMPLING CRITERIA:

##### 1) INCLUSION CRITERIA:

- The students from mid school.
- The students of 7th and 8th std.
- Those who are present at the time of study.
- Students who are willing to participate.

##### 2) EXCLUSION CRITERIA:

- Those who have participated in similar type of study.
- Students from 1st to 6th std.
- Students from secondary and higher school.

#### MAJOR FINDINGS OF THE STUDY:

- **Percentage wise distribution of students according to their demographic characteristics.**  
n=200

Demographic Variables	No. of students	Percentage(%)
<b>Age(yrs.)</b>		
12-13 yrs.	112	56.0
14-15 yrs.	88	44.0
<b>Gender</b>		
Boy	94	47.0
Girl	106	53.0
Transgender	0	0
<b>Grades</b>		
7 <sup>th</sup> standard	100	50.0
8 <sup>th</sup> standard	100	50.0
<b>Area of residence</b>		
Urban	105	52.5
Semi Urban	55	27.5
Rural	40	20.0
<b>Type of family</b>		
Joint	71	35.5
Nuclear	112	56.0
Extended	7	3.5
Single Parenting	10	5.0
<b>Education of father</b>		
Uneducated	11	5.5
Primary	29	14.5
Secondary	20	10.0

Higher Secondary	45	22.5
Graduate	59	29.5
Post Graduate	36	18.0
<b>Education of mother</b>		
Uneducated	13	6.5
Primary	18	9.0
Secondary	34	17.0
Higher Secondary	34	17.0
Graduate	62	31.0
Post Graduate	39	19.5
<b>Occupation of father</b>		
Farmer	34	17.0
Businessman	57	28.5
Private Employee	59	29.5
Govt Employee	38	19.0
Laborer	12	6.0
<b>Occupation of mother</b>		
Homemaker	136	68.0
Private Employee	27	13.5
Govt Employee	24	12.0
Other	13	6.5
<b>Duration of online classes</b>		
Less than 2 hrs.	30	15.0
2-3 hrs.	58	29.0
3-4 hrs.	59	29.5
>4 hrs.	53	26.5

➤ **Assessment with level of attitude score** n=200

Level of attitude score	Score Range	Level of Attitude Score	
		No of students	Percentage
Strongly Disagree	0-20%	0	0
Disagree	21-40%	0	0
Neutral	41-60%	21	10.5
Agree	61-80%	149	74.5
Strongly Agree	81-100%	30	15
Minimum score		23	
Maximum score		50	
Mean attitude score		35.98±4.68	
Mean % attitude Score		71.97±9.37	

The above table shows that 10.5% of the students were neutral, 74.5% were agreed and 15% of them were strongly agree for attitude towards online learning. Minimum attitude score was 23 and maximum attitude score was 50. Mean attitude score was 35.98±4.68 and mean percentage of attitude score was 71.97±9.37.

➤ **Association of attitude score related to online learning with demographic variables:**

The given table shows the level of significance and not significance association of attitude demographic variables.

Significant	Non-significant
Association of attitude score among online learning in mid school student in relation to age.	Association of attitude score among online learning in mid school student in relation to gender.
Association of attitude score among online learning in mid school student in relation to grade.	Association of attitude score among online learning in mid school student in relation to area of residence
Association of attitude score among online	Association of attitude score among online

learning in mid school student in relation to types of family.	learning in mid school student in relation to education of father.
Association of attitude score among online learning in mid school student in relation to occupation of mother.	Association of attitude score among online learning in mid school student in relation to education of mother.
	Association of attitude score among online learning in mid school student in relation to occupation of father.
	Association of attitude score among online learning in mid school student in relation to duration of online classes.

**RESULT:** According to the findings of the current study, students had a positive attitude about online classes, i.e., It proves that as the attitude of mid-school children is high.

#### DISCUSSION:

**Liaw SS, et al, Sep 16, 2011**, “A study investigating learners’ attitude towards e-learning”, In this study, 424 university students use the Blackboard system for two months and then complete a questionnaire. According to research, male students had more positive views on e-learning than female students, and internet skills is a key predictor of self-efficacy and excitement for e-learning. Self-efficacy and motivation, both intrinsic and extrinsic, are also important indicators of e-learning behavioural intention.<sup>3</sup>

**Ramadan K, et al, Oct13, 2019**, An analysis of “factors affecting learner’s attitude towards the integration of e- learning into the higher education system in Libya”, Examining students' perceptions about e-learning is essential since it is a widely used approach that contributes to our knowledge of the challenges associated with adopting such technologies into the educational processes. The findings show that MU students value e-learning. It was also shown that learners' views differed depending on their instructional subject, prior exposure with ICT technologies, and English ability. Furthermore, the findings indicate that a thorough understanding of those factors is necessary for creating an interactive platform that can improve students' knowledge and make learning more efficient and enjoyable.<sup>4</sup>

**Peytcheva-Forsyth R, Dec 10, 2018**, “Factors affecting students’ attitude towards online learning, the study shows distance learning is becoming increasingly prevalent in Bulgarian higher education”. The study's overall goal is to assess the implications and dependencies of various impact on pupils' attitudes toward online learning and distance education. In aspects of the provisions of online and distance teaching at Sofia University, the data show a significant population of students' willingness and favourable attitude toward the use of educational technology. The technological advances integration into educational journey, as well as the availability of a virtual education mode, are among the next steps to be taken, yet the importance and role of face-to-face learning should not be neglected.<sup>5</sup>

**Malkawi E, et al, Oct 14, 2020**, UAEU students’ “satisfaction and attitudes towards e-learning and virtual classes during COVID-19 pandemic”, The findings show that learners’ satisfaction with eLearning and virtual classes is high overall, with differing degrees of satisfaction between objects. For the independent variables, there was no substantial difference at the level ( $\alpha=0.05$ ). According to the findings, there is an analytical significant difference in students' satisfaction and attitudes toward e-learning systems and virtual classrooms for such independent variables of academic background.<sup>6</sup>

#### RECOMMENDATION:

Recommendation for the further studies based on the analysis of the present research study following recommendations could be:-

- A study to assess the attitude regarding online learning classes among selected institutes.
- A similar study could be conducted on the overall middle class age group students.
- To assess the attitude regarding online clinical session towards medical students.
- A comparative study can be conducted regarding online learning classes with medical and non- medical students.
- A study can be conducted regarding online classes among the new admission for undergraduates.

**CONCLUSION:**

The study aimed to assess the attitude regarding online classes among mid-school students. The data was collected in online mode with confidentiality also the selected areas for schools was School Of Scholars, Sawangi and New English Highschool, Wardha. The objectives were set so that it was helpful for the researchers to reach the desire findings. For the data collection, the tools were distributed in three sections i.e., demographic variables, structured scale to assess the attitude. The findings of the present study show a high attitude regarding online learning among mid-school students.

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**POWDERS FROM TANKER UNLOADING TO STORAGE EQUIPMENTS USING PNEUMATIC CONVEYING SYSTEM**

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**<sup>1</sup>Revannath. P. Nale, <sup>2</sup>Abhishek D Lokhande and <sup>3</sup>J Phani Krishna**<sup>1</sup>Sr. Engineer – Design, RIECO Industries Limited, Pune, Maharashtra, India<sup>2</sup>Asst. Manager: Engineering, RIECO Industries Limited, Pune, Maharashtra, India<sup>3</sup>Head: Engineering Projects, RIECO Industries Limited, Pune, Maharashtra, India

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**ABSTRACT**

*Tanker Unloading Systems are designed to handle dry bulk solids and powder material. This system ensures direct transfer of powders from Tanker to various Storage Silos. Tanker Unloading Pneumatic Conveying system can be designed to unload the tanker and fill the Silos ranging from a capacity of 10–50 TPH (tons per hour). The Bulk Tankers will be unloaded by different methods based on the type of tanker and the material properties. Bulk Tankers and unloading systems are offered in various types namely, conical discharge, aerated bottom type, screw discharge etc. depending on the material being handled and its properties This article presents the study of tanker unloading system using pneumatic conveying system. This system helps better to avoid humidity in powders during storage and transport. By use of this system Manpower saving is done. Also, spillage and material wastage are very less.*

*Keywords— Tanker Unloading, Storage, Pneumatic Conveying, Bulk Solids.*

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**I. INTRODUCTION**

Bulk solids have quite a low bulk density, which leads quickly to the handling of large volumes of materials. There are different formats to handle bulk, like bags which can contain as much as 25-50 kg, or Big Bags which can contain 1-2 m<sup>3</sup> of material, however for large industries this can lead to a lot of handling for a given mass throughput. One of the solutions is then to transport the bulk material on trucks equipped with a tank on the trailer. These tanks have typically a size of 30 m<sup>3</sup>, sometimes more. Taking the example of sugar, this allows in one operation to handle the equivalent of 960 bags or 30 Supersacks. Factories have thus a lot of interest to get their bulk materials in tankers, if they are equipped with silo to hold the discharge material, as it allows to convey in one time a lot of products, reduce drastically the needs for manual handling, and thus allows a higher factory throughput. Many bulk solids are handled in road silo tankers, such as flours, sugar, but also chemicals or plastics. This kind of bulk solids tanker has to be discharged pneumatically in order to be able to empty the tank efficiently, discharge quickly enough, and send the product to a silo. The objective of this paper is to list some design considerations that one must have in mind to design and operate a pneumatic conveying system to discharge a road tanker into a silo.

The main objective of this paper is to study the Tanker unloading system used in many industries to unload bulk material. Material, Powder OR dust like Wheat Flour, Talc Powder, Animal feed, Hydrated Lime, Cement, Gypsum, Limestone, Fly ash, Corn, Quartz, Sinter dust, ESP dust etc. can be unloaded to storage silo by using tanker unloading pneumatic conveying system.

**II. LITERATURE REVIEW**

[1] David Mills - Pneumatic conveying design guide 2004. Pneumatic conveying systems are basically quite simple and are eminently suitable for the transport of powdered and granular materials in factory, site, and plant situations. The system requirements are a source of compressed gas, usually air, a feed device, a conveying pipeline, and a receiver to disengage the conveyed material and carrier gas. The system is totally enclosed, and if it is required, the system can operate entirely without moving parts meeting the conveyed material. High, low, or negative pressures can be used to convey materials. For hygroscopic materials dry air can be used, and for potentially explosive materials an inert gas such as nitrogen can be employed. A particular advantage is that materials can be fed into reception vessels maintained at a high pressure if required

[2] Er. Tobin Thomas – Design of Pneumatic conveying system IJIRST –International Journal for Innovative Research in Science & Technology| Volume 3 | Issue 11 | April 2017 ISSN (online): 2349-6010 Conveying of powder like substance in industries are used by conventional conveyors such as bucket elevators, screw conveyors. In case of volatile or expensive materials such as Titanium dioxide, which is used mainly in paint industries, usage of conventional conveyors is not economical. Titanium dioxide powder is used to produce inks, plastics, textiles, ceramics etc. It is commonly produced by the chloride route process of Rutile grade pigment. Due to the fine powdering nature of the material this system has certain problems like frequent spillage and fine powder escaping. Though some amount of powder is regained with the help of filtrate recovery

process, this process is time consuming and expensive. Thus, this spillage and other associated troubles are found to be one of the serious problems faced by the industries. Here fully refined powder material is wasted whereby the industries suffer huge losses both directly and indirectly. Hence this study is to determine the reasons behind this problem and to suggest a suitable remedy. As a long-term solution, replacement of the conventional conveying system with a Pneumatic conveying system was suggested.

[3] Dr David Mills - A Quick Check Method for The Design of Pneumatic Conveying Systems. advances in dry processing 2002. www.powderbulksolids.com. The design of pneumatic conveying systems is usually carried out based on scaling data obtained from the pneumatic conveying of the material to be transported. If previous experience of conveying a given material is not available, data is generally derived for the purpose by conveying the material through a test facility. Most manufacturers of pneumatic conveying systems have such test facilities for this purpose. If it is required to make a quick check on the potential of an existing system, or to provide a check on design proposals, there is little information readily available for the engineer to use. Pneumatic conveying does not lend itself to simple mathematical analysis, and it is likely that many engineers would not be able to undertake such a task easily, particularly if it were a low velocity dense phase system.

[1] [4] Prof.S.B. Bansode - "Design and Fabrication of Pneumatic Conveyor System" International Research Journal of Engineering and Technology (IRJET) Volume: 04 Issue: 04 | Apr -2017. Pneumatic conveying system is a conventional material handling system like belt conveyor or chain conveyor. The main advantage of pneumatic conveying system is that material is transferred in close loop, thereby preventing the environmental effect on the material and vice versa. In these topic different parameters like air velocity, pressure, particle size and shape, distance to be conveyed, which govern the design of the system, are described. The research work carried out on the pneumatic conveying system in the last decade considering these parameters are also presented. No standard procedure is available for the design of pneumatic conveying system. As the configuration of the system changes, variable involved also changes, and one must change the design considerations based on the applications. So, there is wide scope for experimentation in the field of pneumatic conveying system.

[2]

### **III. WHY PNEUMATIC CONVEYING SYSTEM, SILO STORAGE AND TANKER UNLOADING SYSTEM.**

- Total hygiene is maintained due to zero human intervention as required in Food Industry.
- Storage Silo is extensively used where the requirement is for nonstop production during supply chain disruptions. This bulk storage also ensures high quantity of powders handled in production line as manual handling does not suffice to such huge production requirements.
- It also provides a clean and dust free operation ensuring zero contact of human on the product.
- Less spillage resulting in good yield recovery.
- Flexibility in routing – can be transported vertically and horizontally by the addition of a bend in the pipeline.
- Automized powder handing ensuring better process controls, less manpower, safety in plants.
- Total hygiene is maintained due to less exposure of manhandling.
- Dust free operation, less spillage resulting in good yield recovery.

### **IV. TANKER UNLOADING PNEUMATIC CONVEYING SYSTEM CONSIST OF –**

1. Compressed Air Source.
2. Compressed Air piping.
3. PRV: pressure Regulating Valve.
4. Ball Valves – Manual Type.
5. Non-Return Valve.
6. Tanker with Material filled and ready for Unloading.
7. Flexible Hoses at Inlet and outlet of Tanker.
8. Inlet and Outlet Hose Cam Lock Couplers.

9. Destination Silo
10. Target Box at Silo Top.
11. Vent Filter with Centrifugal Fan.
12. Breather Valve.
13. Level Switches – High & Low & Level Transmitter.
14. Fluidization arrangement.
15. Local Control Station.

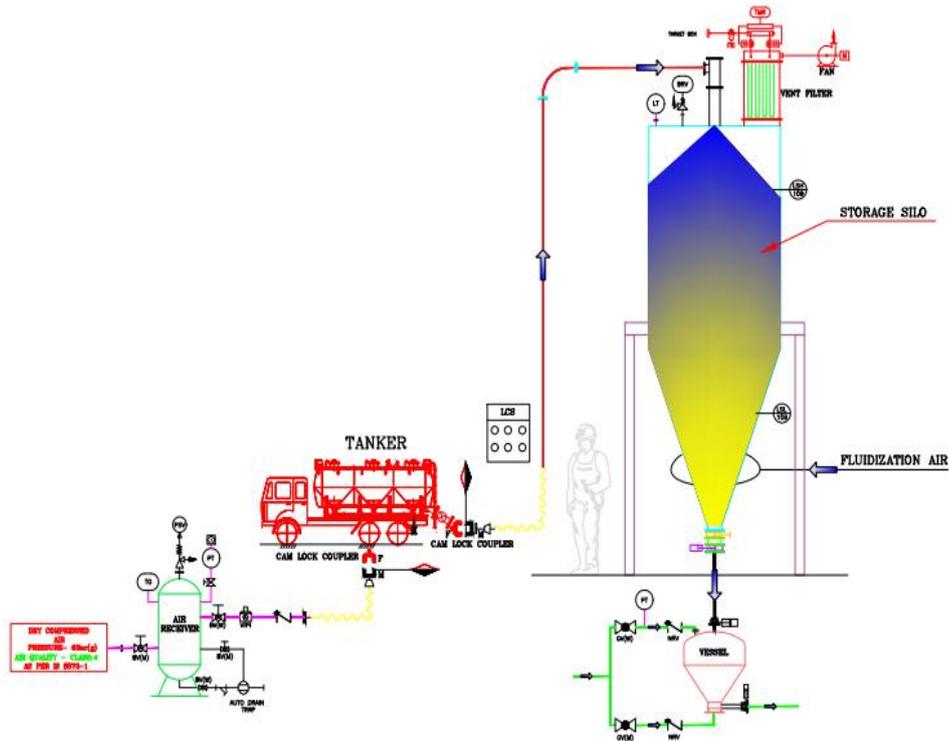
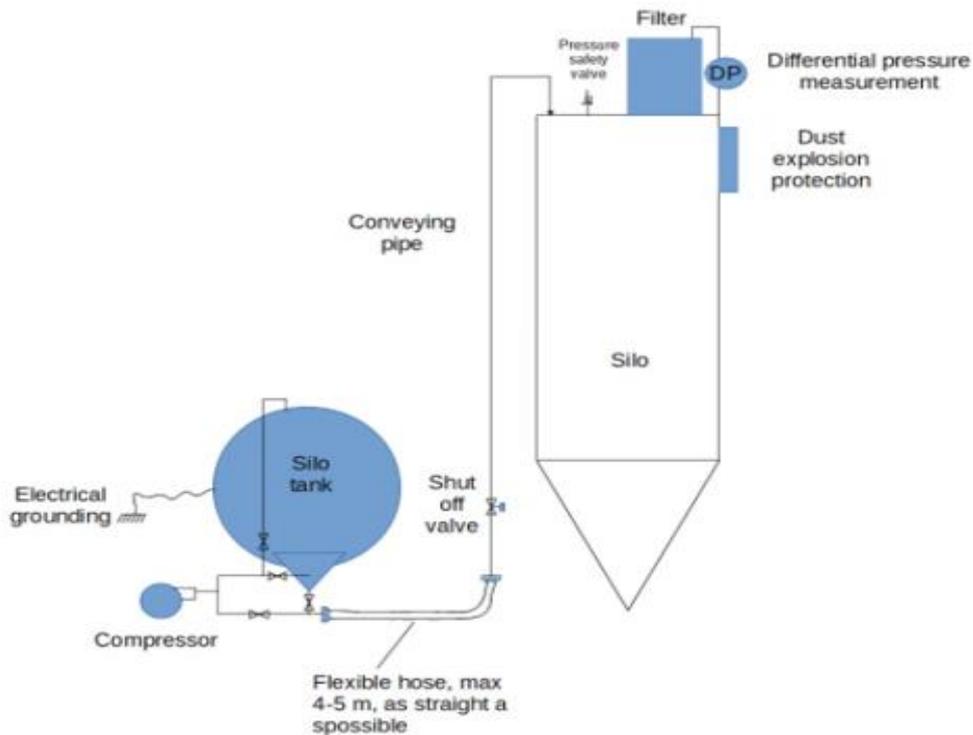


Fig. – 1 Process Flow Diagram of Tanker Unloading using Pneumatic Conveying System



**Fig. – 2 Silo Tank Pneumatic Unloading System**



**Fig. – 3 Tanker Valve Manifold.**

**1. Compressed Air Source.**

For Tanker unloading compressed air is used. Source of compressed air used either Roots blower OR compressor air generated by compressor.

**2. Compressed Air piping.**

Compressed air is passed from source to tanker inlet through pipe. Pipe used for air conveying shall be either mild steel or stainless steel depends upon the requirement of industry.

**3. PRV: pressure Regulating Valve.**

Pressure reducing valve PRV is used at the outlet of Air receiver to adjust the air pressure required for tanker unloading. PRV can be adjustable manually during commissioning/unloading of tanker. Fig. -4 shows the PRV.



**Fig. – 4 Pressure Reducing Valve.**

**4. Ball Valves – Manual Type.**

Ball Valves are used at inlet and outlet of Air receiver for flow ON/OFF purposes. Also, this valve can be used for maintenance if any required when compressor is running OR compressed air is at air receiver.

**5. Non-Return Valve.**

Non return valve is used in airline just before the tanker unloading inlet connection. Non return valve is used as safety to avoid any back flow of material from tanker.

**6. Tanker with Material filled and ready for Unloading.**

To fill the silo with material tanker must be available with bulk material. Tanker with inlet and outlet couplings shall be checked for connection with flexible hoses at inlet and outlet nozzle connections.

**7. Flexible Hoses at Inlet and outlet of Tanker.**

Flexible hoses are used while tanker unloading. One is connected to compressed air line to Tanker inlet nozzle. And second flexible hose is connected between tanker outlet nozzle and to the conveying pipe which will go to

silos. Flexible Hoses have one end Cam Lock coupler arrangement and other end fixed with pipe by means of hose clamps. Fig. 4 shows flexible hose connection.



**Fig. – 5 Hose and Cam Lock Couplers**

**8. Inlet and Outlet Hose Cam Lock Couplers.**

To avoid compressed air leakages from inlet Hose Cam Lock coupler arrangement is used. Similarly at outlet i.e., discharge connection if coupled with cam lock coupler. After making of these connections only tanker unloading compressed air source is started through Local Control panel. Fig. -4 shows cam lock couplers arrangement with Hose.

**9. Destination Silo.**

Storage silos are the destination silos where Bulk material is stored as per process requirements. The capacity of storage silos may vary up to thousand tons. Many accessories Like, Target Box, Vent Filter, Fluidization arrangement, Level Switches are used on silo for safety purposes and easy filling and discharging of silo. Fig. – 1 & Fig. -2 shows silo with all other accessories.

**10. Target Box at Silo Top.**

Target Box is the metallic part having cylindrical shape with entry of conveying pipe on shell portion. Target box has bottom opening for discharge of material coming from conveying line. Also baffle plate arrangement is provided to avoid direct strike of material on body and easy filling of silo with increase in area of conveying line.

**11. Vent Filter with Centrifugal Fan.**

Vent filter is the type of filter used for fast evacuation of conveying air coming into the silo. For the suction effect centrifugal fan is used at the outlet of vent filter. This arrangement helps to avoid explosion of silos and easy complete filling of silo without any air in the stored material. Vent filter with centrifugal fan is used as a safety device which gives signal through differential pressure switch when filter gets clogged.

**12. Breather Valve/Pressure relief Valve.**

These valves are designed for balancing and avoiding over pressure and negative pressure in silos or hoppers when charging and discharging material from/to silos. These units are used in silos, hopper, containers where positive or negative pressure is not desired.



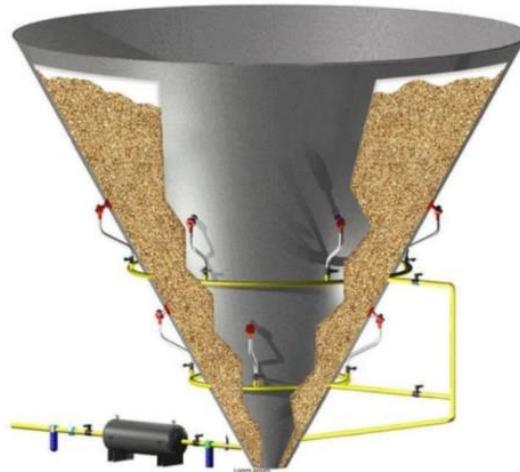
**Fig. – 6 Breather Valve.**

**13. Level Switches – High & Low & Level Transmitter.**

Level switches are also used as safety and to understand the silo level whether going to very low or going high to take necessary actions to stop or start filling of material to the silo. Level transmitter gives the level of material inside the silo. This will give exact idea of quantity of material available in silo.

**14. Fluidization arrangement.**

Fluidization prevents rat-holing, bridging, segregation, or material residues at the bottom of the silo/Hopper cone. Various materials exhibit perfect mass flow the moment a certain amount of air is added at regular intervals during bin or silo discharge. The air enriched material gains desired flowability.



**Fig. – 7 Silo Fluidization arrangement.**

**15. Local Control Station.**

Local control station is electrical panel from where system start, and stop is carried out. When all assembly is ready for conveying then blower OR compressor system is started through to unload the material into the silo. Also, when signal of silo filled comes then conveying system stopped through control panel. Control panel is Located near to silo with support legs for operation.



**Fig. – 8 Local Control Station.**

**V. CONCLUSION AND DISCUSSION**

Here from this paper, we have studied the Bulk Tanker unloading system with its all applications where this system can be used. Tanker unloading gives the bulk material filling into storage silos with less time and without any spillage of bulk material.

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**MODELLING THE RELATIONSHIP BETWEEN GREEN BANKING PRACTICES AND GREEN EQUITY: THE MEDIATING ROLE OF GREEN IMAGE, GREEN TRUST AND GREEN LOYALTY****Deepthi S Pawar<sup>1</sup> and Dr. Jothi Munuswamy<sup>2</sup>**<sup>1</sup>Research Scholar, CHRIST (Deemed to be University)<sup>2</sup>Associate Professor, School of Commerce, Finance and Accountancy, CHRIST (Deemed to be University)**ABSTRACT**

*Green banking is strategically a novel concept which has been gaining attention due to the increasing call for global environmental sustainability. It is basically a form of banking which primarily takes into consideration the social and environmental aspect of all banking activities. Though previous studies have addressed this concept from various dimensions, it has been observed that not many researchers have focused on green banking from the marketing perspective. Thus, the present study proposes a conceptual model of green banking, with a set of constructs, which are an outcome of the bank's green initiatives and practices. The purpose of this study is to develop an original framework, which clearly delineates the linear relationship between green practices and green equity. This research is conceptual in nature and the required data have been retrieved from various published works relating to Green Banking. The necessary links and references have been duly made towards validation of the proposed model on Green Banking Practices. The conceptual model outlines the influence of green initiatives and practices on green equity, which is further mediated by the role of green image, green trust and green loyalty. The development of the proposed constructs will aid the banking institutions in enhancing their customers' perception positively. Thus, the banking institutions can impactfully support the transition towards a green economy by rightfully investing in fostering the proposed constructs, which will thereby enhance the customers' perception, while also improving the banking institutions environmental performance.*

*Keywords: Green banking, Green image, Green trust, Green loyalty, Green equity*

**1. INTRODUCTION:**

The concept of sustainable development has transcended across various disciplines, organizations, civil society's, media and academia, and even to the commercial banking industry in the form of "sustainable banking" (Mendez & Houghton, 2020). Sustainable development and the protection of the environment has been recognized as an alarming subject of concern globally, due to the harsh ravages caused by mankind (Munitlak-Ivanovic et al., 2017) (Sinha, 2013). The exhaustive consumption of limited resources has jeopardized the ecosystem and its repercussions are being reflected in the form of global warming, greenhouse effect, climate change, pollution etc. This deleterious situation calls for immediate actions and solutions from across global institutions (Khairunnessa et al., 2021) and banks being the major players of an economy, they play a decisive role in directing capital towards various facets of development in the country. They have huge capabilities in potentially incorporating sustainable attributes, and significantly guiding the economic players in the transition towards a sustainable ecological banking system. These institutions can implement and foster green policies and initiatives, support green technology and also encourage its clients to adopt sustainable green practices (Miah et al., 2021). They can provide crucial guidance for the economic transition that will unfold new financing opportunities, investment projects, as well as portfolio management for the creation of a favorable green economy (Rajput et al., 2013). As these institutions have substantial influence over multiple stakeholder groups, they can significantly impact on mitigating the environmental problems that are threatening the growth of a country (Bukhari et al., 2020b)

Green Banking is an emerging concept, which intends to integrate and address environmental issues through its business activities and develop new innovative green models to foster sustainable development in the banking industry. The United Nations Environment Programme (UNEP) defines the green economy as "the process of reconfiguring businesses and infrastructure to deliver better returns on natural, human and economic capital investments, while at the same time reducing greenhouse gas emissions, extracting and using fewer natural resources, creating less waste and reducing social disparities". According to Indian Banks Association (IBA, 2014) a green banking system is like a normal banking system, which considers social and environmental factors with an aim to promote environmental sustainability, while ensuring optimum utilization of natural resources. Thus green banking coherently fosters environmental sustainability, through the adoption of sustainable practices in the banking industry.

The banking institutions have huge capabilities in fostering environmental sustainability. As the financial standing does not determine the level of environmental involvement of banks (Zabawa & Kozyra, 2020),

several banks are internally reorienting their strategies and policies, in the form of implementing green practices and initiatives to reduce their carbon footprint on the environment (Miah et al., 2021) (Ch, 2014) (Mozib Lalon, 2015). On the contrary, they are externally influencing the activities of their stakeholders in the form of financing companies which leave positive impacts on the environment, while also impeding finance to other carbon sensitive industries (Li et al., 2018). Additionally, these institutions are also incorporating environmental criteria into the banks credit risk management system (Weber et al., 2015). Several banks have already started investing to mitigate climate risk, though the process is still slow and needs utmost acceleration (Odeku, 2017). A lot of banks have been innovatively designing green products for their prospective customers (Choudhury et al., 2013). Green bonds, being a conservative and sustainable innovative product of the banking industry (Maltais & Nykvist, 2020), provide huge opportunities for financial players to explore further on the strands of sustainability in the global capital markets. Thus, the banking sector in the emerging economies play a proactive role in fostering the transition, by incorporating environmental consideration as a prior commitment in all their business activities (Zhixia et al., 2018).

Previous studies have focused on different dimensions of green banking. It has been found that not many studies have addressed green banking and its impact from the marketing perspective. Thus, this paper addresses this gap by developing a conceptual model, based on a thorough review of literature. Studies pertaining to green banking both from the Indian and as well as the Global context have been reviewed to develop a conceptual model of the same. This paper is structured into three parts. The first part of the study throws light on the concept of green banking and the scope of its implementation in the banking industry, while the second part deals with modelling the conceptual framework and channeling the proposed constructs. The last part of the study includes conclusion and scope for future research based on the proposed model of green banking.

## **1. CONCEPTUAL FRAMEWORK**

The concept of green banking has gained significant attention in the recent past. Presently, the green banking adoption is not merely considered a change in the banking strategy, but is treated as an ideological shift in the banking industry (Bukhari et al., 2020a), which involves reorienting the banks' objectives, strategies and practices in line with sustainable developmental principles. With the adoption of green banking, the banks can undoubtedly impact alleviating environmental problems, which are presently hampering the growth of the economy. Previous few studies from the bankers point of view have acknowledged the role of stakeholders (Asim Ali Bukhari et al., 2019), the management (Okoyere-Kwakye & Md Nor, 2021), committed leadership qualities (Javeria et al., 2019), perceived ease of use, perceived usefulness, performance expectancy and the effort expectancy (Shafique & Khan, 2020) as a few attributes which have led to the adoption of green banking concept. (Rehman et al., 2021) affirmed that there is a significant influence of policy, daily operations, and investments on the adoption of green banking practices. The green banking initiatives, being a multi-stakeholder approach (Hoque et al., 2019) can robustly bolster the transition towards a greener economy. Acknowledging their role in the transition towards a sustainable economy (Mulder & Koellner, 2011), globally several banks have adopted various strategies, policies and practices which promote environmental sustainability. While some banks have adopted in-house green practices like effective utilization of resources, centralized computer networking system, restructuring of banks infrastructure, developing social and environmental management system etc. (Zhixia et al., 2018)(Ch, 2014) (Mozib Lalon, 2015) (Mehedi & Kuddus, 2017), other banks are strengthening their green marketing activities, encouraging their customers to avail their products and services through internet and mobile banking interface (Shakil et al., 2014) (Yadav & Pathak, 2019) (Lekakos et al., 2014) (Herath & Herath, 2019). Further, certain banks have adopted green financing mechanisms, to provide capital only to projects and industries which foster environment sustainability (Akomea-Frimpong et al., 2021) (Azhgaliyeva & Liddle, 2020) (Zheng et al., 2021) (Odeku, 2017) . In this manner, the banking institutions have been promoting socially responsible investments in the economy (Martini, 2021) (Li et al., 2018). Presently, a few banks are also investigating the project's carbon footprint on the environment. This has led to the inclusion of environmental criteria into the bank's credit risk management system (Weber et al., 2015) (Cui et al., 2018). Additionally, some banks are following green reporting practices, which ensure transparency in the banking industry (Kaium Masud et al., 2017). Thus, these green initiatives and practices have the potential to create better opportunities, which can boost the bank's environmental performance, and as well as retain and earn new prospective customers (Sharma & Choubey, 2021) These green initiatives and practices influences the green equity in the banking institutions. Green equity is defined as the customer's subjective and intangible assessment of environmentally friendly products or services provided by an institution, above and beyond its objectively perceived value (Kayaman & Arasli, 2007). As the success of any banking institution is attributed to its relationship with the customers, it is imperative to consider the impact of green practices on customers' perception. A study by (Wu et al., 2016) confirms that Perceived green experiential quality of practices and

products significantly influences green equity of institutions. A positive customers’ perception on green banking practices will enhance the environmental performance of banking institutions. Thus, the banking institutions should comprehensively reorient and restructure its practices, innovate quality products and services in line with green principles, which will foster environmental sustainability while also influentially impacting the customers’ perception and green equity in the banking institutions.

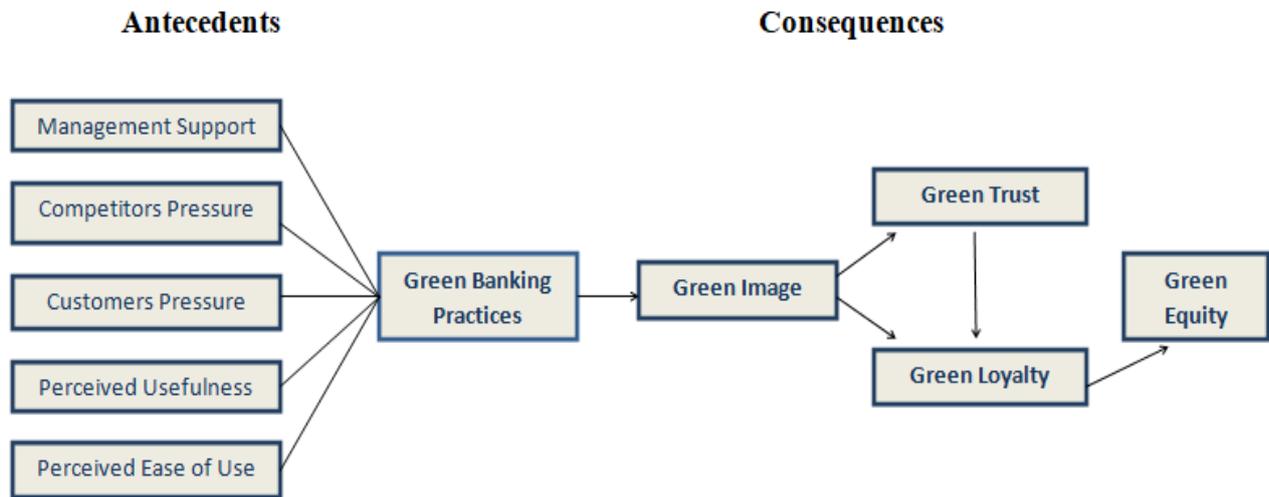


Figure 1: Proposed conceptual model

The above model clearly delineates the relationship between green banking practices and green equity. The green banking practices creates an image in the cognitive minds of the customers. This is primarily termed as green image. (Chen, 2010) defines green image as that which represents the customers’ perception of a companies’ environmental commitments and concerns. Studies have empirically proven that green banking initiatives have a significant and positive impact on the green image of the banks (Ibe-enwo et al., 2019) (Bashir et al., 2020). The green image further leads to the creation of green trust among the customers of the bank. Green trust can be defined as “a willingness to rely on a product, brand or service or expectation arising out of its ability and credibility because of its environmental performance” (Chen, 2010). It is empirically proven that green trust mediates the relationship between green image and green loyalty (Chen, 2010) and strongly influences the customers repurchase intention towards green banking products and services (Lam et al., 2016). While the customers further intend to repurchase green products and services from a particular institution, there is a sense of loyalty which gets instilled among customers towards the green products and services. Customer loyalty is basically defined as satisfied customers who are inclined to purchase or utilize the goods and services from a particular vendor or institution. These are the customers, who show repetitive purchasing intention of products and services, suggest it to others, and also oppose all types of propaganda (Rashid et al., 2020). When customers have a positive attitude towards green products and services and are loyal to one particular bank, their perceptions regarding green banking positively changes and they intend to purchase more eco-friendly products and services, thereby impacting the green equity in the banking institutions. A study by (Chen, 2010) empirically proves that that green brand image, green satisfaction, and green trust are positively related to green brand equity. This was supported by (Khandelwal et al., 2019) who also confirmed that green brand image, satisfaction, trust, loyalty and green advertisement are strong agents that influence customer’s attitude towards green brand equity. Thus, these green constructs positively enhance the customers’ perceptions and green equity in banking institutions. Therefore, in order to enhance green equity, it is essential to foster the proposed constructs, improve the quality and credibility of the institution, while building trust and reliability in environment friendly products and services (Delafrooz & Goli, 2015).

**CONCLUSION:**

The proposed green banking model consists of six constructs, which have been chosen for the study after an in-depth review of literature. The conceptual model put-fourths a sequence of activities which follow after the implementation of green banking practices. This paper traces the impact created by green banking practices on green equity with the help of various set of constructs relating to green banking. From the present study, it is evident that green banking practices impactfully influences the green equity in banking institutions. This paper also theoretically supports and is in line with previous studies which prove that green image, green trust and green loyalty play a mediating role between green banking practices and green equity. A thorough understanding of the relationship between each construct will help the banking institutions in formulating a

coherent mix of green strategies, implementing guiding green policies, adopting productive green practices and developing innovative green products to positively influence customers' perceptions, while also robustly supporting and expediting the transition towards a sustainable green economy.

The proposed conceptual model is of great use and importance to the banking institutions. Primarily, this study approaches the concept of green banking from the marketing perspective, which is not adequately addressed in previous studies. Secondly, the paper improves the understanding of green banking and its related constructs with substantial links and references. Lastly, it provides a structural framework for banking institutions to positively enhance their customers' perception and also create a robust customer base by strengthening the proposed constructs. Lastly the present study is subjected to a few limitations. As the study proposes a conceptual model, future studies can empirically validate the proposed model. The model can also be further extended by taking into consideration few other constructs like customer satisfaction, green innovation, green advertisements etc.

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**CONTEMPLATE, CAPTIVATING, AND CREATIVE: 3CS OF LEADERSHIP COMMUNICATION FOR DEVELOPING PROFESSIONALISM**

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**Ashwini Sonawane**

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**ABSTRACT***Research Objectives:*

1. To identify the interrelationship between leadership and effective communication.
2. To classify the different leadership styles with the variance of communication skills.

*Research Design:* The selected articles for this study are collected from EBSCO, UN resources, WHO and ProQuest databases and Google Scholar. Articles in all three databases are searched for the keywords "Leadership" and "Communication". Altogether 72 articles retrieved from the above databases. After careful reading abstracts and sometimes the main bodies of the articles, the irrelevant articles were left out. Consequently, 64 articles were found relevant. After carefully reading the main body of each article, 11 articles were excluded as these articles are beyond the scope of this study. The final dataset consists of 52 articles. The researcher has used ATLAS.ti 8.0 for thematical categorization between leadership and effective communication skills and thematic analysis is performed to identify the interrelated factors.

*Findings:* The leader must adjust his leadership style by keeping in mind the intellectual level and maturity of the employees. Here maturity does not refer to the sensitivity or age, but it means work stability, tendency to handle complex situations, the potential of achieving the given target.

*In line with expectations,* the study showed that leadership is mainly communicative, while task-oriented leadership is significantly less communicative. The communication styles were strongly and differentially related to knowledge sharing behaviors, perceived leader performance, satisfaction with the leader, and subordinate's team commitment

*Results show that there exists a connection between leadership communication style and personality traits. Also, the finding revealed that leadership communication style determines organization productivity. More so, the finding established that personality traits and communication styles have a combined effect on organizational productivity*

*Implications:* Despite the fact that employing executive worthy communication abilities and talent are measured to be the furthest authoritative skills an executive essentially possess. Aimed at an operative executive it is compulsory to confirm encouragement, accountability, calculated and professional relationship, forming and handling a worth scheme and to deliver sustenance and inspiration to his groups.

*An executive is capable to undertake entire effort by concrete leading, effective preparation, observing and communicating. In the middle of these statement factors flawless and accurate communication is of paramount significance. Effective communication turns as profitable for a spearhead to lead meritoriously. So, on the foundation of the research of the preceding effort done by countless researchers and authors in the previous era, the researchers have made an endeavor to discover in what way leadership is exaggerated through communication.*

*Limitations:* The data collected may not be sufficient to explain the concepts in a broader way. Due to Copyright issues, delay in taking permission for refereeing some of the best papers. Future research needs to collect more data and resources related to leadership communication to write a good conceptual paper and developing a better conceptual model.

*But due to time lack of time and inability to get access to libraries and portals it was difficult to collect all resources. The data collected may not be sufficient to explain the concepts in a broader way.*

*Keywords – Effective Communication, Leadership Styles, intellectual level, worthy, professional relationship.*

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**INTRODUCTION -**

Effective and precise communication perform as an imperative element to produce as a well-organized and fruitful leader or executive. To accomplish specialized victory executives essentially be operative and considerable conversationalists. It is imperative that executives and their groups essentially absorb the how-to interconnect effortlessly as this will resolve not only to assist groups to widespread their missions efficaciously

but also permit establishments to accomplish achievement and progress (Lee Froschheiser). According to numerous academics, the portent is one who has the capacity to take responsibility, straight, inspire, or arouse others. They have an assertiveness to influence others and to make them monitor the objectives or the participles well-defined by them. They are outcome leaned henceforth, well versed skilled and professional in monitoring tough to challenging circumstances and support to boost the productions of groups operational through him. A leader might be anybody, as the individual who has custody, captivating boldness is a leader. The person could be a President of any nation-state or a managerial employed in an association. These individuals consume a constellation of leadership potentials but are not able to lead if they are not good communicators. Communication empowers them to stake what they partake and what they expect from others. So, it is active and J. Barrett, 2006). Worthy communication skills support to progress improved thoughtful understanding and philosophies amongst individuals stimulate them to monitor the ideologies and beliefs which their leader needs to indoctrinate in them. When there is a lack of worthy communication skills, an executive flops to accomplish the objectives established by him and by the establishments and a mark him an unproductive leader. By intermingling more proficiently with his group and associates, an executive can rise his perspective and will be able to get the effort done by associates of his group. Virtuous leaders are actually well awake with the statement that dynamic communication is not a single means of method relatively there are two vital crescendos which widespread communication procedure: language and attending i.e speaking with indulgent. They recognize that they cannot mark this practice lasts until they received and implicit fittingly by their group associates. To mark this progression even means smooth an active executive has sounded prearranged and strategic objectives in his mind which he has assumed to be achieved after communicating. For achieving the objectives of the communication leader imagines the opinion, emotions and knowledge level of the receiver and prepares action to support communication so as to make others understand the message wants to deliver. He conveys the sounded, premeditated messages with encouragement and describes them to the desire and determination to be achieved with the support of communication. Requesting for confirmation or consideration of the communication tortuously is one of the significant annotation abilities of a respectable leader. Though getting any note, he keeps all his flaps open and attempts to figure out the central indication. Even in circumstances of undesirable feedback he doesn't drop his sentiment and take it as a chance to acquire new-fangled things. He continuously attempts to comprehend the weedy topics and analyze the effectiveness of the communication. In the circumstance of miscommunication taking counteractive amounts to resolve the blunder is also imperative and essentially be done by the executives or leaders. Henceforward, to inaugurate oneself as a countless and operative leader one must be an effective convincing communicator and needs to learn skilfully the art of extraordinary communication, this would promote further, upkeep executive and his group to accomplish new heights of eminence leadership. Attitude is also interim as an imperative characteristic of operative leadership. It is essential for a leader to be subtle towards ethical philosophies. Rendering to an exploration on leadership, the belief is a aspect which any distinct individual needs to have before succeeding someone unreservedly in any state of affairs, whether it may be a battlefield or conference room and want to get guaranteed that the leader they are going to shadow is ingenious and moral (James Kouzes and Barry Posner, 1993). In emerging this belief factor a leader must be capable to segment his idea with them by interrelating with them. Hereafter, for operative leadership, operational communication helps as a weighty component.

#### Further Discussing about 3Cs of Leadership Communication For developing Professionalism-

1. Contemplate
2. Captivating
3. Creative

Above three mentioned Points are the key important aspects of the Leadership Communication.

*“Leadership is hard to define and good leadership even harder. But if you can get people to follow you to the ends of the earth, you are a great leader.”*

-- Indra Nooyi, PepsiCo

*“If your actions create a legacy that inspires others to dream more, learn more, do more and become more, then, you are an excellent leader.”*

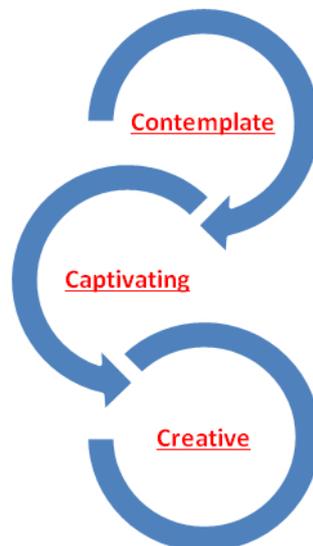
-- Dolly Parton, singer-songwriter

1. **Contemplate** – The perseverance of contemplate on leadership is to increase a healthier considerate of ourselves (our values, knowledge and skills), so we can absorb from our involvements, and familiarize and reply to new leadership trials. The contemplate course includes: Acting on our wisdom about ourselves and

our competence. Self-contemplate in leadership means artefact out time to evaluate yourself as a leader and is grave for your leadership progress. ... Self-reflection also quickens enhancement in your leadership skills and rehearsal – and qualifies you to improved recognize others.

2. **Captivating** – Operative communication can upsurge employee captivating, enhancement workroom efficiency, and determination commercial evolution. Communication is the keystone of an engaged employees. A business's staff represents its most important speculation and lastly controls the accomplishment or disappointment of the organization. Captivating competencies is very crucial part in leadership communication .It is very effective and effortful for upcoming sceniors in the era of globalisation.
3. **Creative-** Creative leadership communication energies efficiency and nurtures accomplishment in a company. Creativity leadership communication is one of the greatest imperative talents of a contemporary business leader. Creativity itself is the desertion of unbending assemblies, a very necessary trait for folks in leadership places to have in a business location. Creative leaders have the skill to look at gears in novel habits and solve glitches by seeing things others don't. Substitutes of creativity include words like inventiveness, imagination, innovation, vision, progressiveness, originality, and resourcefulness just to name a few.

**These three are cyclic in nature. Its never ending stories.Continuous process is always in the form.**



**Fig. 1: 3 Cs of Leadership Communication**

## II. COMMUNICATION: A DYNAMIC CHARACTERISTIC TO A LEADER'S FORTUNE

The supreme indispensable strategic key to prodigious leadership is communication (Towler 2003). A Leader is between one of the personnel with incomparable expertise set and in one condition or extra he has potential to footstep headlong to take custody and guide others who dearth knowledge and dexterity set, try to instruct aids by inspiring them and assist them in accomplishing their single, group and managerial marks. To develop an inordinate leader one should be a pronounced communicator. Principled leaders are constantly reflected as exceptional communicators, they have a vibrant set of ideals and they constantly trust in stimulating and indoctrinating those principles in others. It is due to this motive that their groups escalate them and shadow them as a leader. Actually, an inordinate communicator does not mean pronounced conversationalist. There is an enormous transformation among the two, the plunge of attaining extra facts divides outstanding communicator from a noble conversationalist, who dearth information and gets muddled while interrelating with others, however inordinate communicator express in buoyancy and under no circumstances get muddled because of the data they retain. They have the capability to link to desires and determinations while communicating their thoughts with others. They are awake of the entity that if nosedives to link with the spectators they might not be capable permit their knowledge to them and drive of communication will not be accomplished. The superlative communicators constantly have exceptional excellence of listening tranquility to what others are communicating. This makes them worthy spectator and empowers them to recite an individual or group's attention by analyzing the brashness, behavior, happenings, standards, apprehensions and are capable to amend their messages rendering to the state of affairs. Influential who interconnect commendably to boost and inspire their society are measured to be the superlative cream of the crop or executives. They warrant the

effort, self-control, and a sense of accountability between-group followers. They have the sturdy and exact set of functioning ideologies and trust to integrate the identical in their groups and ever since of this they are exceedingly esteemed and shadowed by their group fellows (Lee Froschheiser). When a leader motivates his group, cluster or individuals nearby him by communicating his philosophies and intentions flawlessly make them enough well-ordered to accomplish the complete prearranged assignment smoothly that concept is Leadership communication. It has been detected that all the executives or leaders are typically tiring in collaborative with lone or another while operating and devote 80 to 95 percent of their period in clutch or group relations each time (Mintzberg, 1973; Eccles & Nohria, 1991) and there is a significant increase in this percentage with the invention of new communication technologies like mobile phones, e-mail, messaging, social sites, etc. This vast percentage of time spent by managers in communicating highlights the importance of strong communication skills for leaders who want to expand their leadership positions. Even many kinds of research have explained the concept that it is effective communication that takes an individual from a lower level to the leadership spot. In fact, it has been proved that individual who can communicate exceptionally, capable of taking the significant decision and are able to get the work done by others is recommended more frequently for a leadership position in an organization (Bowman, Jones, Peterson, Gronouski, & Mahoney, 1964). Good communication skills support in creating an atmosphere for exceptional understandings of what is being communicated and encourage teammates to blindly follow their leader. Thus, to become an expert in leadership communication is an indispensable priority for managers who want to attain excellence and remarkable growth in their professional careers. A leader should make sure that communication is continuous and also ensure the appropriate use of both informal and formal approaches (Bill Back). It is very good to use a combination of formal and informal approaches while communicating. The informal mean of communication helps to get exact and more regular evaluations to report concerns more rapidly. Informal interaction during breakfast meetings, roundtable meetings are always proved effective and helpful for discussing and finding solutions to various issues like trust and credibility whereas formal approaches require proper planning and execution.

### **III. MANAGEMENT OR LEADERSHIP COMMUNICATION**

Leadership communication is well-defined as stimulating and boosting an individual or a crowd by the methodical and expressive distribution of data by means of outstanding communication abilities. Leadership communication is a difficult procedure that flinches from emerging policy for communicating, inscription exactly and then speaking effectually to switch to problematic circumstances. Leadership communication has three main features: Fundamental, Management, and Commercial. With an upsurge in leader's collection, there is a necessity to extemporize communication abilities to achieve huge prospects and to develop abundant or extra active entirely conceivable states. So, intricacy upsurges with a rise in the glassy of leadership. The Fundamental Facets Method comprises inscription and speaking; these are the personalized abilities and are essential to be extended, to top and accomplish higher assemblies or groups. Communicative social identifications, attending tolerantly, group supervision and group conferences, providing exercises and training amenities and mentoring are the talents that help to succeed gigantic clutches and are Management Facets Method of leadership communication. The Commercial Facets Approach are the abilities mandatory at considerably advanced altitudes of leadership, and there is an essential to interrelate with an outside scope, abilities which are maximum wanted: continue operative associations, communication throughout alteration and disasters, broadcasting relations and image building. For an association the prime encounter these times is to gain the belief of its personnel, commercial associates and consumers. An association with influential who are skillful enough to interconnect quick-wittedly and regularly with faultlessly strategic and devoted communication strategies, to aid to inspire not merely workforces, but professional companion and consumers as well to faith on the association. Now the query originates, why a leader is mandatory to shape faith amongst shareholders? The response to this query is; Leaders are the individuals who are shadowed by numerous individuals since they have faith in him. They don't shadow the leader they cannot rely on (Diane Bean). Reliance is a persuasive instrument that can upsurge dependability, truthfulness and stretches you an additional benefit in event of improbability. One cannot construct reliance as it cannot be built but earned or received. For decent and competent leaders it is comfortable to receive reliance because they know the worth and status of the structure and supporting reliance. Leaders have to place entirely conceivable pains with the assistance of their groups which boost commercial associates to have the reliance on the establishment's leadership. Communications theatres a substantial part in constructing reliance by generating an atmosphere that allows leaders to chief proficiently inspiring teams to slog and attaining the last goalmouth (Jodi Macpherson). It develops so interestingly for a leader to arouse, include and grasp their maximum bright group associates if the leader won't believe their messages (Kaufman). If the workforces have belief in their leader and are right well conscious of what is working everywhere, they will be greatest satisfied and invigorated. By allocating

indispensable data with workforces, leaders can grow a philosophy of belief and can effortlessly construct connotations with workforces and additional commercial stations that simplify help establishments to produce more speedily. Reliance constructing actions include communication administration, obtaining the correct webs, optimistic chat about what others to be complete and the response of communication. Reliance is important because it is the trust of the people that has the capability to create a vast form of slightly and convert major into a minor. Hence, it is a must for an organizational leader to make sure that the people associated with them contain the trust factor.

#### IV. LEADERSHIP CHARMS/STYLE PERSUADING EFFECTIVE COMMUNICATION

As we previously identified that communication has an inordinate impression on operative leadership accurately matching with the circumstances is leadership charm. Diverse leadership charms also encourage communication development. There is a vice-a-versa relation between the two (Benita Zulch, 2014). Following are the charms of leadership that shake communication.

- A. **Style or Charm Discussing to the various state** – The charm of leadership is related to the exercise and use of miscellaneous leadership charms under different circumstances rendering to the want of spectators and individual leadership potentials. Under every situation, the communication gets pretentious as some circumstances request straight and harsh communication and in other state leader has to choose for unintended habits of communication. This can level mark communication an operative procedure occasionally or might lead to miscommunication.
- B. **Objective Oriented on Leadership Style or Charm-** Each leader has an aim and objective for him and for his group. This aim and objective are harmonized with structural intentions and ideas. The leaders have to communicate the objectives and goals to his group so as to encourage them to realize them with competence. The leader communicates in a mode so that he will be capable to make others see what he is expecting from them. Group Engrossment, operative listening, unblemished and appropriate communication is the foremost nature of this style or charm. This style or charm of leadership makes communication an actual communication.
- C. **Commanding Leadership Style or Charm** In this flair of leadership, the leader assists his groups to accomplish their individual effort goals and group marks by telling them the suitable approaches and screening the correct instructions to realize those goalmouths. He performs as an executive, who sustenance and allows his group to shadow the track which clues them to attain their goalmouths additionally effortlessly and flawlessly by interacting successfully.
- D. **Developmental Leadership Style or Charm** This style of leadership distinguishes between two rudimentary methods of leadership; one is a work-orientated and the other one is individually orientated. Achievement, motivation, willingness and ability to take responsibility, learnings and information control the mixture of this style. This leadership style does not be prejudiced by on so numerous means, but its pivots on the condition, where and why it has to be cast-off. The significance of this style is that during communication, associations must have adequate attention to make the statement an efficacious one

#### V. HURDLES TO OPERATIONAL LEADERSHIP COMMUNICATION

Communication basically means to transferal the data or message from one individual to another or to a collection. Although operative leadership communication means transmitting a message by keeping in the notice the thoughtful and aptitude of the receiver and to mark indisputable that the receiver will be capable to discover the careful sense of the message or data accepted to the leader. Operative leaders while interacting necessarily safeguard that there would be certainly not fortuitous to any kind of miscommunication or misinterpretations. But, on the foundation of preceding readings, virtually it is not viable for a leader to mark all the communication operationally as countless fences like clatter, fracas, exceptional indulgent stages and unlike traditional upbringings make it tough to make statement operational. While communicating in a set, granting all upright leaders stab to retain attention the listener's point of view, but still it turns problematic to create one and all to realize, what precisely a leader desires to convey. The challenge in communication ascends from the turbulences or hurdles in the broadcasting, either by the leader or by the receiver. Some of the hurdles are as which disturbs noble and operative communication are as follows:

- Absence of arrangement or proper planning and drive before interactive with others confine a leader to interconnect effectually with his group.
- Even if the arrangement is prepared by a leader earlier prior to communicating, but devoid of keeping in mind the kind of spectators will make communication procedures unproductive.

- Selecting incongruous procedures and methods by a leader for performing communication with the group will act as an obstacle and shrinkage the level of a particular understanding of the communication done.
- Selecting incorrect dialectics as a communication method is also one of the major obstacles which make leader communication unproductive.
- Absence of faith on an individual or each other and contempt is an extra feature that creates leader communication fruitless.
- Incorrect supposition about auditor by disregarding their sentiments and compassions, modify communication into miscommunication.
- Use signs, postures, and gesticulations which do not upkeep the arguments used through communication.
- Overlooking the opinion facet while interacting is also a hurdle.
- Absence of self-assurance, standards, bravery, and awareness also halts communication becoming an actual one
- The dearth of foremost management abilities also marks a leader to interconnect hopelessly.
- Incapacity to adjust to deviations is to a sturdy obstruction.

These are the few of the blocks which hamper the operative communication course and disturb the leadership communication skills of a leader. To get free of these blocks they essentially to reach mastery in central abilities.

#### **VI. BY WHAT MEANS COMMUNICATION MENDS MANAGEMENT ABILITIES? : PROPOSITION/PHILOSOPHIES OF OPERATIVE MANAGEMENT COMMUNICATION.**

Communication was previously measured as an easy-going ability that has not at all influence on establishments. Even while employing distinct communication abilities not ever was a chief principle for an appointment. But the notion has been different; communication has an actual very great impression on corporate. It is presumed that active interacting with the leaders kindles personnel to stay involved and to accomplish their obligations competently (Diana Clement, 2008). Upright communication encompasses a pre-arranged strategy. A leader's communication necessarily counterpart with his activities and must be two-way communication. Sharing of immoral bulletin must be done face-to-face in an operational style so as to moderate its undeviating effect. The root cause of many problems is the improper and untimely sharing of information or communication. Effective communication management is a principal leadership skill. Here stated few communication moralities to develop an admirable leader:

- A leader must be assertive enough, through communicating with others. Individuals must trust the communication prepared by their influential. Absence of self-assurance through communicating can create crew associates painful, and unresponsive about their effort. Self-assurance assistance a group to work unruffled to attain preferred objectives.
- Accurate influencer's all the time have to interconnect the instructions accurately to his group and should monitor those directions and instructions himself, which he presumes to be shadowed by others and essentially interconnect ramblingly to his group that he is accomplished enough to do what he presumes from them. He must prime his group by setting instances himself.
- A prodigious leader must be enthusiastic and dynamic while interconnecting. If the leader is cynical, deleterious or detached, no one in the group could relate to him. Only extremely enthusiastic and forceful leaders are measured as active leaders since they have a huge prospective to encourage and to increase the confidence of their groups.
- Pronounced leaders must be sturdy and reliable while they interconnect. There must be a significance, polish, and orderliness when they interrelate with their groups, but can also alter bestowing to the spectators. They have to exaltation their character as a truthful communicator to grow credibility amongst his group and numerous commercial frequencies. A rapid alteration in arrogance is not measured as the leader's superlative value.
- A respectable leader must every time be informal to approach deprived of any obstructions if the group followers are missing with hesitation about the data pooled during the communication procedure. He must be eagerly accessible to his group and to further conduits as well. Isolation creates a leader unproductive and bungling.

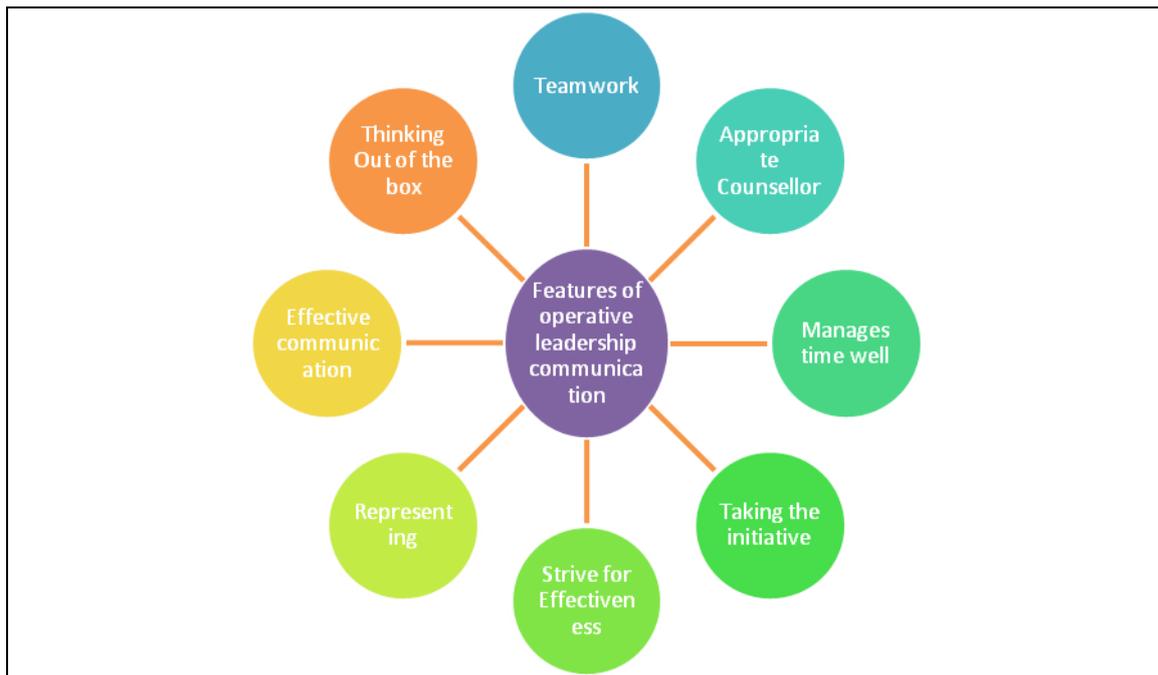
- A leader to develop an operative must have a vibrant thought practice. There must be lucidity in electing communication methods, frequencies and methods by guardianship in attention to the knowledge level and understanding of the spectators. He must actually knowledgeable to achieve complex issues and will be capable to alter them into a humbler system to make his group comprehend and to achieve tremendously healthy.
- Communication by leaders must be vibrant, transitory and also he should worth the opinions, thoughts, and sentiment of others. An outstanding leadership essentially to esteem all philosophies, understanding, edification, ethical standards, numerous demographics and communication predispositions.

## VII. LIMITATIONS

The chief opinions presented in this paper have emphasized the common awareness and accepting of elementary leader's announcements, but still there occur some boundaries such as there is still extra literature that should be studied and allied to this paper and review. But due to time lack of time and inability to get access to libraries and portals it was tough to gather all-important resources. The information gathered may not be enough to clarify the ideas in a wider means. Due to Patent issues, delay in captivating approval for refereeing a few of the superlative papers. The upcoming investigation needs to gather more statistics, facts, information and resources associated with leadership communication to inscribe a worthy conceptual paper and evolving an improved conceptual model.

## VIII. CONCLUSION

As specified in the overview, plenty of revisions and investigations have been completed with a similar resolution of recognizing how communication and leadership are interconnected to each other. Why outstanding communication abilities are necessary to achieve a group at the office or to cope with an association competently? How communication gets pretentious by the altered management and leadership styles? What all are the abilities which make a leader an impeccable communicator? In finishing outlines, we can state that operative communication and leadership composed stretches an operative leadership communication. A leader cannot become an operative leader until unless he is an outstanding conversationalist and necessarily use his this capability to let personality's shadows him. He must have skills and knowledge that will be capable to interconnect that information to others at work. Must have the proficiencies to encourage the group to succeed which appears to be unmanageable for others. Communication creates a leader operational who advances improved thoughtfulness in groups. These understandings bring a logic of hope in personnel on the leader and on collectively other, effort collectively, which additionally emphasize agreeable dealings with group supporters and generates an exceptional graft atmosphere. Though working with such a decent, vigorous, optimistic and affable environment they get encouraged and passionate to effort much tougher. This keenness concerning their work creates it calm to accomplish their objectives swiftly and hence their efficiency upsurges. On the basis of this inference, the author has projected a conceptual model of operational leadership communication in Fig. 1. There is an extra point of view that diverse leadership styles also have an impression on communication. As different communication styles have an impact on leadership similarly different leadership also influences communication (Benita Zulch, 2014). With an alteration, a change in style the influence of communication also alters. In some of the styles like where the leader has to tackle a rough or serious condition, he wants to be slightly firm and leadership style will develop authoritatively but must have control over his communication otherwise it may become a miscommunication or an unproductive one. In additional sample where he has to deal with a crowd with unlike work insolence and polishes here, he wants to be additional people-centric and must interconnect in a means that he will be able to interconnect at discrete heights even while interrelating with a crowd. At the conclusion, we can say that together communication and leadership are connected intensely and cannot be completed independently. But still, there is no such clarification or elucidation to these problems as thoughts may diverge person to individual and every separate has his personal observation about the stuff happening around. On the basis of the directly above conversation and thoughtful of the concept, the author has designed a Conceptual Model for operational leadership communication. According to this model Operational communication and leadership, composed progress improved considerably amongst group followers and the spearhead or manager. More understanding instructs the belief element which is very imperative to effort together. Belief gives amiable dealings which additionally aids to shape a decent waged atmosphere where personnel feels inspired and augmented with self-assurance and work in harmonization and this harmonization harvests the best of their presentation by achieving the given marks; separate as well as group objectives. Given below the model figure:



**Fig. 2:** A Conceptual Model for Operational Leadership Communication

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**ANALYSIS OF BACK PRESSURE & EFFECT OF EDUCTOR UNDER THE ROTARY AIR LOCK VALVES FOR PNEUMATIC CONVEYING SYSTEM**

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**Ashwin Jadhav<sup>1</sup>, Vaibhav Shinde<sup>2</sup> and J. Phani Krishna<sup>3</sup>**<sup>1</sup>Lead Engineer, RIECO Industries Ltd., (India)<sup>2</sup>Lead Engineer, RIECO Industries Ltd., (India)<sup>3</sup>Head of Department - Engineering, RIECO Industries Ltd., (India)

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**ABSTRACT**

*Rotary Airlock Valve has been used for the controlled feeding device for the Pneumatic conveying system for the smooth & uniform solid loading into the pipeline. For the lean phase pneumatic conveying with positive system, back pressure or airlock is major parameter which leads to material blockage issue. With many advantages over conventional conveying system, it stands in a position where in it can replace heavy duty conveying systems in many applications. Its drawbacks are considerable path for the future scope on this conveying mechanism. This paper reviews about pneumatic conveying with rotary airlock feeder using venturi eductor to avoid the back pressure.*

*Keywords: Conveying System, Rotary Airlock valve, Back Pressure, Venturi Effect, Feeder*

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**I. INTRODUCTION**

*Rotary Valves are one of the most common means of feeding pneumatic conveying systems, both pressure and vacuum types. There are many other applications where they are used simply for metering of a controlled feed rate. Given the great numbers of these items in use, it may be tempting to think that the selection of Rotary Valves would be a straightforward and widely understood process. Why do so many troubles come from these apparently simple components? This paper seeks to explain the apparent mystery surrounding the selection of the right valve for the job and warn of the pitfalls awaiting the careless. Commonly thought of as a 'commodity' product it is hoped that with a little understanding of the factors that affect the correct selection of a Rotary Valve, it will be recognized that the choice of type and features to be included from the apparently bewildering variety available is often vital if satisfactory performance for a given duty is to be achieved.*

**II. HISTORY**

*Pressure Differential is always a vital consideration as the higher the differential the greater the leakage of air / gas and can have a great bearing on the final choice of valve size and features. High upward leakage can significantly reduce material flow by both reducing the bulk density through fluidization and by physically opposing flow. High leakage can enhance the abrasiveness of some hard fine particle products, transfer moisture and create unstable flow conditions.*

**III. BASIC COMPONENTS****1. Housing Body and End Cover**

*Generally, the manufacture of Rotary Valves follows good general precision engineering practices with materials of construction selected according to the duty needs or occasionally customer preferences. The Housing is normally of cast construction for rigidity and cost; however, fabrications are occasionally used for non-standard configurations and 'one-off' large valves that cannot be satisfied from cast patterns. Fabrications or machined from solid are increasingly used for critical pharmaceutical use where guaranteed flaw-free validation is essential. The inlet throat design can be critical as it is a very dynamic area and can influence the product flow into the Rotor Pocket, drive torque levels and the effective dispersion of leakage air.*

**2. Housing End Covers**

*This fall into two categories; those with inboard mounted bearings and those mounted on outrigger extensions.*

### 3. Inboard Bearings

These bearings are generally confined to low cost, low duty valves and are typically offered for low pressure differential applications, filter/ cyclone, and general discharge duties where the product does not exhibit difficult handling characteristics.

### 4. Outboard Mounting

This mounting is believed to protect the bearings from direct product contamination, however, there is only limited benefit in this regard as any seal failure usually results in product 'jetting' along the shaft directly at the bearing. The primary reason for outboard mounting is to provide space for accommodating a wide range of alternative shaft sealing arrangements. There is the added benefit for larger rotor shaft diameters necessary to limit rotor deflection under high operating loads.

## IV. APPLICATIONS

Addition of venturi Eductors convert the output of a blower into suction that can be used to entrain and feed powders, pellets, and bulk solids into a pneumatic conveying system. Because they have no moving parts, they can operate almost entirely maintenance-free. The eductor acts to compress the air/solids mixture to a pressure adequate to overcome losses in the downstream convey line. The eductor has three connections:

- Motive Air
- Suction or Product Inlet
- Discharge

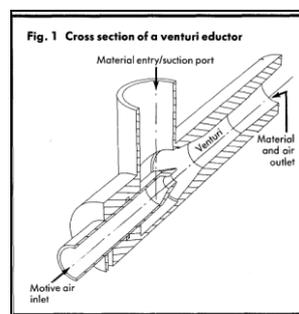
Venturi Eductors are used to feed bulk solids, such as powders, pellets, flakes, and particulates, into positive, dilute-phase conveying systems. They are commonly used in place of rotary valves where airlocks simply cannot perform adequately. Eductors are attractive to install beneath other solids processing equipment because, by creating suction at the product inlet, they enable dust-free material conveying systems. They are commonly installed beneath:

- Baghouses/Dust Collectors
- Volumetric and Loss-in-Weight Screw Feeders
- Screener/Classifier Outlets
- Mixers, Grinders, and Mills
- Bins, Silos, and Bulk-bag Unloaders

In applications involving fine, abrasive, or irregularly shaped products, this is an enormous advantage. Designing with eductor from the beginning ensures the most reliable product feeding available.

## V. RESULTS AND DISCUSSION

The design its eductor to convey product at about 3500 to 4500 ft/min. This is high enough to convey most bulk materials with plenty of margin (fluidization velocity is not a direct function of bulk density) and minimizes line losses and degradation. The nozzle orifice size— carefully chosen – precisely regulates air flow in the line.



Feeding positive pressure pneumatic conveying system represents around 50% of valve application. In general performance terms, pneumatic conveying duties are potentially the more problematic of rotary valve applications.

This is because the performance (throughput) of the valve is usually affected by the pressure differential. Consequently, it is very easy to get cyclic and erratic overall performance if there are weaknesses of design and or construction within the system.

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*As the valve is sited at the interface between the inlet feed system and the conveying system, poor throughput or high wear within the valve is blamed on it. For vacuum conveying system the, the valve sizing and selection should be made considering high through put/high filling, as the material is sucked from valve discharge. For pneumatic conveying the section of valve and its features should be accurate out of experience with the product.*

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**WOMEN ENTREPRENEUR: A SURVEY REPORT ON PROBLEMS AND CHALLENGES FACED BY SMALL SCALE ENTREPRENEURS IN CHHATTISGARH**

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**Dr. Swarnalatha.V<sup>1</sup> and Ms. Advika Dwivedi<sup>2</sup>**<sup>1</sup>Assistant Professor, Christ Academy Institute of Law, Bangalore- 560083<sup>2</sup>II Semester BBA LL.B., Christ Academy Institute of Law, Bangalore- 560083

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**ABSTRACT**

*Entrepreneurship is a driving force behind the country's economic progress. Economic growth is the consequence of entrepreneurs' great efforts, and entrepreneurs can control economic growth by their activities and decisions. Women's entrepreneurship needs to be shaped and shaped by their entrepreneurship and expertise. This will enable women to respond to emerging developments both domestically and globally and to build skills to support and aspire for excellence. The relevance of women's entrepreneurship is highlighted in this study, which also considers the function and participation of women entrepreneurs in the Indian economy. The researcher has interviewed fifteen small scale entrepreneurs and observed, recorded the problems and challenges faced by them. The purpose of this research is to emphasize the role and contribution of women entrepreneur, strategies to overcome the challenges. The present study also highlights Female entrepreneurs make a substantial contribution not only to their families but also to society as a whole.*

*Key words: Women, entrepreneur, economic growth, contribution, challenges.*

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**INTRODUCTION TO ENTREPRENEURSHIP-**

In the modern age, entrepreneurship has become more relevant. The pattern is worldwide. The developing countries also benefit from the growth of entrepreneurship. On the opposite, entrepreneurship has acquired popularity in the recent past in emerging economies such as India. It is regarded as a way to promote self-employment in developed countries. But much beyond that, you need to enhance and maintain the country's economic development. For the growth of an area or nation, it is important to make efficient and optimal use of available resources in general and of human resources. The qualified personnel would certainly use the other services to the best advantage. A developing economy such as India needs businessmen who are using limited natural capital. The growth of the nation needs competent entrepreneurs to take chances and exploit any opportunity to exploit the available natural and physical capital.

But the situation has improved in modern times and women are the most creative and inspiring entrepreneurs. The movement of women entrepreneurship was established in 1970. But in 1991, as the modern industrial policy came into being, the term became popular. Female participation in the entrepreneurial world was also promoted by the desire of women to be economically self-sufficient and the growth of education. But now the situation has completely changed, and in almost all industries, woman entrepreneurs are in the engineering, service, and trade industries. The reasons for this may be the positive reaction of women to changing circumstances and women's perception of financial security and freedom. In reality, government programs and incentives play an imperative part in shaping the growing number of women entrepreneurs. Today it is impossible to neglect the part of women in financial growth, and their economic progress, achievements are very important. However, women's entrepreneurship still has a lot to do with growth.

**Concept of Female Entrepreneurs-**

The equality and liberation of women is a philosophy that has long been associated with us. It has become increasingly important to increase women's quality of life in the developed world. The advantages of women's entrepreneurship in the past are many and diverse. Women make up over 49.6% of the world's population. They are involved actively in all levels of the market. It is also evident that growth and empowerment in entrepreneurship are mutually complementary. Women have been motivated in the educational, economic, cultural, and related spheres through their participation in various enterprise activities. In all business sectors in advanced countries like Canada, the United Kingdom, Germany, Australia, United States, etc., it can be understood that women entrepreneurs have had important effects. Women business entrepreneurs because of different pushing and pulling factors which enable women to have a self-employed job and stand on their legs. The motivating force behind this impulse is, for example, moving towards autonomous decision-making in your life and work. This means that female entrepreneurs embrace tough positions and become economically stable to fulfill their personal needs. In addition, an inherent characteristic of women entrepreneurs who can contribute ideas to both the family and society is a deep desire to do something good. In this digital and diverse age, the demands and opportunities provided for women are increasingly rising, as work seekers become job creators. In particular in developing countries, the growing number of female entrepreneurs is a global trend. Women own

more than 25% of all businesses in emerging market economies. Many claim that women are "pushed" rather than "pulled" into businesses, but recent surveys have shown that many women, particularly younger women, have now been consciously choosing self-employment. Women entrepreneurs can be described as women or a women's association that initiates and organizes and runs a business. Women entrepreneurs' participation depends on their results, which are often influenced by the underlying facilitators and barriers. Women undertakings have been recognized in the last two decades for their substantial contributions to their countries' socio-economic growth.

#### **Female entrepreneurs with context to India-**

In order to address the shifts in demographics, challenges, and global economies, and also be able to maintain and aim for success on the sculpting scene, women's enterprises must have adequate molding and expertise. Women make up 48.04% of India's overall population. Despite this, in many respects, women nevertheless lag behind men. Over the years there have been steadily higher levels of women's literacy and job prospects. They are also engaged in various activities at a late stage. Women participate and join into enterprises and create new kinds of businesses. Women are encouraged to join industrial institutions by the government of India. Women then began to create businesses and work together to build themselves and their economies and emerge with flying colors. Though women played a vital part in the community of India, the low status of women in society does not adequately affect their entrepreneurial ability. Their position was only clearly recognized with a significant change in women's health and female empowerment strategy since the Fifth Five-year Plan onwards. The growth of entrepreneurship among women has become an essential element of the goals of our plans. Various initiatives and programs for women's entrepreneurship are being initiated in India. The attitude towards women has to be changed so that equal rights are guaranteed, as enshrined in the Constitution. The advances inequity between men and women is sluggish and partially because of a lack of funding for the political commitments. According to our former late President APJ Abdul Kalam, Women's empowerment is a prerequisite for establishing a positive government, and a stable country guarantees women empowerment. In India, policymakers and administrators have long acknowledged the significant role played by micro, medium-sized, and small businesses in their national economies and hence have over the years taken concerted action to encourage and foster the development of central and state governments. However, these actions were not especially successful. Today, these companies also face countless challenges that hamper their development and success. The MSME sector continues to suffer from numerous financial, marketing, manufacturing, distribution, and infrastructure problems. While some are more or less general to a variety of small businesses in the country, some have special significance for classes of small businesses in rural areas and the backward regions. In this paper, we are going to emphasize what difficulties do female entrepreneurs face.

#### **ROLE AND CONTRIBUTION OF WOMEN ENTREPRENEURS IN INDIA-**

According to Swami Vivekananda - "*Woman is as courageous as a man.*"

Women entrepreneurship was recognized over the past decade as a significant source of untapped economic development. With education and knowledge dissemination, Indian women have changed to an untraditional level of activity through expanded kitchens, handicrafts, and traditional cottage industries. The government has emphasized in the new industrial policy the need for women to implement unique entrepreneurship training programs so that they can launch their activities. Special cells for woman entrepreneurs have also been developed by financial banks and institutions. This has greatly contributed to women's entrepreneurship in India. The following points illustrate the role of women entrepreneurs:

#### **Economic contribution:**

Women's economic practices directly contribute to growth and effectiveness in addressing informal market issues, and poverty mitigation is a major issue for policymakers. First and foremost, they contributed to the formation of capital. Entrepreneurs employ the issuance of industrial securities to mobilise idle savings from the general public. The efficient utilisation of national capital is achieved through investing public savings in production. This is critical for rapid economic growth and increases the rate of capital formation. Second, there has been an increase in per capita income. Women entrepreneurs in India have taken advantage of chances as well. They convert latent and unused resources like soil, labour, and capital into national revenue and wealth in the form of commodities and services. They help to raise the country's national net product and per capita, both of which are important indicators of economic development. The third step is to create jobs. In India, women entrepreneurs are involved in the creation of jobs both directly and indirectly. They create jobs for people by establishing small enterprises.

**Social Contribution:**

Female entrepreneurs also greatly strengthen the country's balanced regional growth and living standards. First, balanced Regional Development. To eradicate ethnic economic growth inequalities, women entrepreneurs in India. They build enterprises in underdeveloped locations to benefit from government resource concessions and subsidies. Second, improvement in living standards. Reducing the shortage of fundamental goods and developing new technologies can be accomplished by building up small-scale factories. The women entrepreneurs in this country produce a wide range of products and thus raise standards of living at low prices. Third, innovation, entrepreneurship is vital to innovation. It involves applying an innovation commercially. An innovator, a visionary, and an industry leader are assumed by the businessman. In designing new technologies, as well as current products and services, entrepreneurs have contributed a great deal of creativity. All these have led to economic growth by job generation, more profits, and so on.

**Supplementary contributions:** Women entrepreneurs have also made significant contributions to society's culture. In current society, women are welfare workers who contribute outside the home and obtain a sense of independence. As a result, women entrepreneurs in our country play a key part in the protection of the climate, the backbone, and future integration, either directly or indirectly, serving as charges and so contributing to the country's economic progress.

**Problems faced by Female Entrepreneurs-**

In India, women face multiple challenges in advancing their corporate life. In their attempts to build their business, women entrepreneurs face many problems. In different points, women face many difficulties, starting from the start of their initial business and running their business. In India, women entrepreneurs face the following major problems:

- 1. Shortage of Finance:** They cannot afford foreign financing because of the lack of tangible market stability and credit. Male relatives do not want to spend their money in women's company because their ability to effectively operate is lacking in confidence. Females' businesses are even struggling with the need to finance work capital for daily operations. Since finance is the lifeblood of a company, the majority of female businesses fail owing to a lack of suitable financing options. The challenges that continue to exist in the male sphere are to get money from bankers, run the working capital, lack credit opportunities. Marketing and financial issues are barriers where women are not greatly supported except by education. Any of the challenges are systemic and beyond entrepreneurial reach.
- 2. Marketing problems:** The intermediaries are also used by women entrepreneurs to sell their goods that bring big profits. The women entrepreneurs are exploited by the intermediaries. Women entrepreneurs also face challenges in capturing demand and promoting their brands. In these days of heavy competition from male entrepreneurs, a lot of money is needed for publicity. There is also a lack of energy for women entrepreneurs and extra measures to spend and gain the respect of consumers and make brands famous. The challenges in the selling of their goods are continually facing women entrepreneurs. It is one of the major issues because this area is dominated by men, and even women with significant expertise struggle to have an impact.
- 3. Scarcity of raw materials:** The scarcity of raw materials is one of the most significant problems that women entrepreneurs encounter. It is difficult for women entrepreneurs to acquire in adequate quantities and quality the requisite raw materials and other inputs for manufacturing. Raw material costs are fairly high and fluctuating. The challenge of the lack of raw materials faced women entrepreneurs. The collapse of many women's cooperatives, including basket production, in 1971 was mostly owing to a lack of forest-based raw materials.
- 4. Stiff competition:** The rivalry between women entrepreneurs and men's entrepreneurs from organized industries is serious. Many women's organizations have imperfectly established themselves. However, organized companies have to face intense competition.
- 5. Patriarchal Society:** The social mentality in which she has to live and work is one of the greatest challenges for entrepreneurs. Despite fundamental equality, violence against women exists in India. Women in male-dominated Indian society do not receive fair treatment and the male ego places barriers in their path to success. Historically, entrepreneurship has been perceived as a man's domain, and the idea of a woman running a firm has been regarded as a far-fetched dream. As soon as womenfolk start an entrepreneurial project, they must also face a task dispute. Women face these contradictions and are twin-placed. It is an uphill challenge.

6. **Managerial skills are limited:** Female entrepreneurs may not have been specialists in every aspect of their businesses. She won't be able to dedicate enough time to all of her interests.
7. **Not Being Taken Seriously:** In industry, the views and recommendations of women in comparison with the opinion of a man are not often seen as "expert." And if a woman begins a company, relatives, friends, and others will regard it rather than good-looking business as a hobby or side project for families. Finding additional assistance may help combat this stigma, but it is a real gender impediment for women.
8. **The desire to Please Everyone:** Females are also trained to be "kind" and "attention seekers of others" in order to gain others' approval. Women will also have more time to say "no," which may result in lower product/service costs or an overabundance of time and support. This is frequently at the expense of your own needs, your company's needs, or anything else.
9. **Sporting Too Many Hats:** Women seem to have to be everything about their personal life to others and don so many different hats that it becomes really difficult to juggling all. This trend is further enhanced as women add 'entrepreneur' and 'enterprise owner' to the equation. Women will have a tougher time bearing responsibilities if they believe they need to "be doing it own" or are the best person for every task. This takes more time to work in your company than in your company. This is a huge barrier for a profitable company to conquer.

**Challenges:**

The survey found out the following challenges, which can we categorized into three.

**Social Challenges-** The attitude of the company towards acceptable women and men has been proven to be a hindrance to women's advancement in leadership and hence in entrepreneurship. This is the process of socialization and the homeland school and society and other connected elements, which are negative to the carrier lady. Women were expected to take on family tasks more than males as a business was thought to be less significant. They are perceived to be less devoted to Carriers and operate the company as part-time work, which impacts women's access to entrepreneurship. The general and credibility of female entrepreneurs automatically obtained and had to demonstrate competence by the men's entrepreneurs. Research has proven that they do not possess the needed or the requisite prize to be paid in entrepreneurship and the tales of being a woman have frequently been referred to as a hindrance to a successful business.

**Infrastructural Challenges** - The lack of access to money has been seen as a key impediment in female entrepreneurship since the relative is tiny in scale and hence the financial institutions are reluctant to participate in such enterprises or lack suitable collateral for school loans. Most companies initiated by women are mostly financed via personal resources. Women entrepreneurs, particularly those involved in non-traditional industries women, have not been taken seriously when they seek venture capital loans for the sake of venture capital, and therefore women entrepreneurs do not have the influence of former informal networks and are also unlike the access to an indispensable piece of information.

**Role Challenges** - Wilderness conflict between women as whites and/or mothers and businesses is because their family society and businesses expect women to treat husbands without help in the management of either domestic businesswoman otherwise suffering an excessive burden in the multiple roles. Wilderness is a matter of concern to women.

**SUGGESTION TO OVERCOME THROUGH CHALLENGES-**

Some initiatives have been taken for the growth & development of female Entrepreneur but some measures that can be taken to overcome obstacles are: Setting up separate financial cells for females, creating social consciousness through education, facilitating training, the provision of raw materials, proper planning and team Building.

**CONCLUSION-**

It can be concluded that we are today in a stronger position to achieve a significant rise in women's engagement in entrepreneurship. There is also recognition of the importance of women entrepreneurs in economic growth and action is taken to support entrepreneurship for women. It's very apparent from these suggestions that the multi-dimensional approach of the various sectors, including government, financial institutions, female entrepreneurs, and many more, is needed for the growth and support of women entrepreneurship within the community through a multifaceted approach, integrated and coordination of the particular approach. The main element in women's entrepreneurship development is not infrastructure, financial assistance, or the identification of a company, but the challenge is to pave the way for their transition into the business. While the

rise of women as entrepreneurs has many reasons, the concerted, coordinated efforts at all levels will pave the way for women to become entrepreneurs and thus contribute to the societal and economic progress of the friends and family, thus gathering equal rights and equity.

The ability and willingness of women to set up, maintain and supervise their own business, to finance them, and to foster them through society and the family can be a major part of the national economy and can contribute to the economic development of India. Through implementing different schemes and services to participate in economic activity, the Government has increased the role of women. Women entrepreneurs are a developing development in certain regions of the world as they turn into a business economy. If woman entrepreneurs' challenges are adequately tackled, they will become far more effective businessmen than men.

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**SOCIAL CHANGES IN THE INDIGENOUS KNOWLEDGE SYSTEMS OF THE LEPCHAS OF SIKKIM**

**Mayalmit Lepcha**

Research Scholar, Department of History, Sikkim University

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**INTRODUCTION TO SOCIAL CHANGE AND INDIGENOUS KNOWLEDGE**

Social change is inevitable changes in a social group or current cultural structure, nature, social institutions, social behaviours, or social relationship of society. Rapid industrialisation, increasing urbanization and improvements in the human intellectual culture need to change to cope with the incremental changes in the climate.<sup>1</sup> Changes have indeed been enforced or produced generally through legislation, colonization, war and disease for most indigenous local tribes. Furthermore, immigrants populace have left their societies of origin in search of change as they strive for embracing political climates, better economic conditions and the security of their values and principles.<sup>2</sup> Eitzen (1974) illustrated that social changes in a current society driven by two forces, the first force is to desire for methodological or any type of changes and second force limits one's right to encourage and accomplish new and better ways of achieving and attaining goals and needs.<sup>3</sup> Self-learning step which helps the students develop creativity and intelligence should be encouraged. Private tuitions or coaching contribute to cramming ready-made answers that inhibit the ability of students to compose. Knowles (1975) explained self-learning as 'a process wherein individuals, with or without the assistance of others, take the initiative to determine their learning requisite; evolve learning objectives, analyse technical and human learning assets, select and impose effective teaching strategies and assess learning goals.'<sup>4</sup> There are need to be some factors which bring out social changes in society. Demographic factors are transformation in structures and size of the population, biological factors are the issue of intergenerational conflict for the creation of new trends, technological factors, natural factors greatly affects methods of thinking, customs, eating habits, traditions, clothing, etc., legislations and psychological factors all these factors bring out important diversification in the attitudes, beliefs, and even in the social ethics.<sup>5</sup>

Indigeneity reflects concepts of identity, ethnic heritage, and local deep-rooted associations. The indigenous knowledge system is distinctively inhabitant in nature and condition-specific in that it has origins in a specific region and the participation of the individual living there.<sup>6</sup>

Indigenous knowledge is organized information systems to condense all perceptions and beliefs into "knowledge." In this system, knowledge generates from "stories" like basic units of wisdom; progresses towards "knowledge," assimilation of the described processes and values in the stories; and ended in "wisdom," an analytic knowledge refining.<sup>7</sup> Indigenous knowledge system comprises three main processes: historical observation, conventional theory, and discovery. Historical observation does not depend on quantitative surveys in a controlled manner. Rather, it is a reflection of "converging experiences from various viewpoints over time", in real-life circumstances and environments. It has been described as ecological, ageless, limitless, humanistic, relational, pluralistic, communal, experiential, oral and documentary based systems.<sup>8</sup> A crucial factor in this

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<sup>3</sup> Eitzen, D. *Social structure and social problems in America*. 1974.

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knowledge systems relies on the reality of communalism, existentialism, holistic approach, preparation, functionalism and perennialism.<sup>1</sup> Indigenous knowledge system acts as the conveyance with which the ethics of indigenous ideologies, societies, practices, beliefs, and traditions, are disseminated and bring into reality. Transmission occurs through habits/rituals (trying to learn from doing, imitating social gathering activities), verbal communication (narratives, dialogue or tutoring), knowledge institutions (principles of use, value, and symbolism), and through physical/religious forms and objects.<sup>2</sup> Indigenous awareness is not static because it is continually changing and developed through practice, learning, innovation, and the implementation of innovative approaches over time and through daily life experiences. There must be a mutual awareness, or collective memory, related to knowledge system that associate to form an abiding group responsive to the world of individuals and transmit relevant experience. This system of knowledge is not controlled by individuals but constitutively retained by groups as mutual action showing the amount of their awareness, while its diffusion still can be socially differentiated, for instance, by gender and ethnicity, and retained in the minds of people exercising their mystical or legality. This understanding resides within many interlinked aspects of the lives of people, along with fundamental beliefs, principles, civil constraints, and cooperation.<sup>3</sup> The democratic reduction in traditional practices Acharya et al. (2009)<sup>4</sup> published ground-breaking work in this regard to concentrate on the indigenous expertise of the native, vanishing Lepcha tribe in identifying birds and checking the accuracy of the data they produce. Their study threw light on the abundance of Lepcha community indigenous knowledge for bird conservation. Intimate indigenous people aware of this fauna and flora group allowed them to coexist with their surroundings over multiple generations. The challenges are educating folk healers about their weaknesses and strengths, attracting young stars to adopt this profession with monetary benefits, and preserving knowledge and biodiversity.<sup>5</sup>

#### BACKGROUND OF THE STUDY AREA

Sikkim is a multi-ethnic state with different communities dwelling since time immemorial. The Lepchas, Bhutia's and the Nepali's along with other communities constitute the total population of Sikkim which covers 6.3 lakhs approximately out of which only 15% of the total population comprise of the Lepcha tribe. The history of Sikkim dates back from 1640s onwards with the establishment of the Namgyal Dynasty forming a monarchical rule in Sikkim. It is known that the Lepchas are the original inhabitants of Sikkim but the recorded history dates back from seventeenth-century whereas the folklore of the Lepchas gives us a different picture. They call themselves *Rongkup/Rumkup*, which means 'Children of God' as *Itbu Debu Rum* created them. According to the folklore, they believe to be of common stock, descended from Fodong Thing and Nazong Nyu who were created from the pure, virgin snows of *Kinchum chu bong chyu's* pinnacle and sent them down to live, prosper and spread all over the land of *Mayel Lyang* (Sikkim) that lies in the lap of *Kinchum chu bong* which is known as Mt. Kanchendzonga<sup>6</sup>. The Rongs in short was called by the name Lapchey by the Nepali's, which meant pejorative speakers because they were not clear with the terms while speaking the Nepali language as they had their own dialect, which is known as *Rong Ring*. The British addressed the present name 'Lepcha' to the *Rongkup* by anglicizing the Nepali term *Lapchay* to Lepcha and with this name, they are known in present. The Lepchas are considered as the indigenous people of Sikkim but as far as the origin of the Lepchas is concerned, many scholars, anthropologists and foreign writers have different opinions. It is noted that the writers like

<sup>1</sup> J. M Mwinzi. (2015). Theoretical Frameworks and Indigenous Knowledge Systems. *International Journal of Education and Research*, 3(2), pp. 677–684.

<sup>2</sup> Mistry, Op.cit, pp. 211-215.

<sup>3</sup> J. Mistry, & A. Berardi. (2016). *Bridging indigenous and scientific knowledge Journal Item*. Science, 352, pp. 1274–1275.

<sup>4</sup> B. K Acharya, B. Chettri, & L. Vijayan, (2009). Indigenous knowledge of Lepcha community for monitoring and conservation of birds. *Indian Journal of Traditional Knowledge*, 8(1), pp.65–69.

<sup>5</sup> A. K Panda, & S. Misra. (2010). Health traditions of Sikkim Himalaya. *Journal of Ayurveda and Integrative Medicine*, 1(3), pp.183–189.

<sup>6</sup> Tamsang, P.K. (1983). "Unknown and Untold Reality About the Lepchas". Hongkong, Luen Sun Offset Printing Co. Ltd. p.2.

Halfdan Siiger opines that the Lepchas have migrated from the east in earlier times and have permanently settled down in Sikkim and parts of Bengal and Nepal<sup>1</sup>.

### SOCIAL CHANGES IN INDIGENOUS KNOWLEDGE OF THE LEPCHAS

A significant change has come among the Lepchas because of various reasons such as deforestation (in Darjeeling after 1866 and Sikkim after 1888), population growth, and mode of agriculture. In the 17th century, A.D. Bhutias of Sikkim had come from Tibet and converted the indigenous animistic Lepchas into Tibetan Buddhism, creating monarchy in Sikkim as a centralized theocratic political structure.<sup>2</sup> The above immigrant Bhutias freely married the Lepcha and the native population was fastened to the larger Tibetan civilization system. The native people of Lepcha started wearing Bhutia clothes and conducting annual festivals according to the Buddhist calendar and today they and the Bhutias form one religious and cultural body, thus forming one of the distinctive frontier communities in Tibetan cultural region.<sup>3</sup> The emergence of Tibetans in the 15th and 16th centuries influenced greatly the economic lifestyle of the Lepchas. They were exposed to political power, subordination, and cultural transformation possibly unfamiliar to Lepchas. They were confined to the reserve area of Dzongu and lost contact with the outside world. To a certain level, the Lepchas have adapted themselves to the new circumstances, embracing the way of life and language of their neighbours. The encounters with the Nepalese implemented new crop variety-cardamom and wet paddy, together with the terrace model. It has a major influence on the settlement process and socioeconomic habit of the Lepchas. Their community played an important part in Sikkim's political life.<sup>4</sup> The Lepchas and Bhutias together composed loyalist Sikkim National Party, that also called Chogyal's party, on the 30th April 1948.<sup>5</sup>

The Lepchas were hunters and collectors and used to live entire migratory lives. After generations under influence from other communities, they have started to grow rice, millet, maize, buckwheat, pulses, rye, vegetables, sugarcane, and fruit in some regions, with livestock husbandry as another significant economic practice.<sup>6</sup>

It has been recorded that the Lepchas were not so valued for their weaving techniques but for their use, they wove clothes. Also, they are well regarded to be bamboo specialists. Today, Lepchas don't wear traditional dresses. Their traditional clothes were called *Dompra* or *Dumdam* which were nettle weaved but with the changing time and the external intervention, the Lepchas started to adapt the dress worn by the Bhutias in Sikkim. Later, the use of shirts, pants, shorts, etc. is extensive throughout the region and one cannot distinguish between the Lepchas, Bhutias, and Nepalis. The several improvements are also observed in terms of a family-from joint to nuclear, marriage-from intra-community to inter-community, and their alimentary habits, from hunting and jungle food to sophisticated and balanced meals. They once worshipped nature and animals: they were called animists. Under Tibetan rule they slowly became Buddhist, and the faith was profoundly ingrained in them. Today, a lot of them are Christians too. Christianity was adopted among them after being subjected to British rule, during which a significant number of the Lepchas and Nepalis choose to be Christians from the lower classes and castes. Based on religious differences the Lepchas can be divided into two groups-Buddhism and Christianity. Buddhist Lepchas are more cultured and proud and have a dislike for Christian brethren. They are more orthodox and backward in education whereas Christian Lepchas are more open and interact with other communities as well. They are not more conscious of their traditional culture as they are modern, educated, and urbanised.<sup>7</sup> The key components of Lepcha culture and the way of living, customs, and manners are profoundly stamped on the Sikkim and Darjeeling language, arts, and architecture. Lepcha medicine men usually utilize flowers, barks, roots, seed, and leaves, etc. of native medicinal plants. According to study 34 species of plants

<sup>1</sup> Siiger, Halfdan (1967). "The Lepchas, Culture and Religion of a Himalayan People". Part I. National Museum of Denmark. The University of California. p. 47.

<sup>2</sup> H. Risley. *The gazetteer of Sikkim*. 1894.

<sup>3</sup> C. von. Fürer-Haimendorf. *Caste and kin in Nepal, India and Ceylon: anthropological studies in Hindu-Buddhist contact zones*. 1966.

<sup>4</sup> S. D Bhutia. *Political Parties and Ethnicity in Sikkim since 1975*. 2015.

<sup>5</sup> M. D Gupta. *Sikkim Problem and Prospects of Development*. Indus Publishing Company. New Delhi. 1992. p.p. 30.

<sup>6</sup> O. Dwivedi, & B.N Tiwari. *Environmental Crises and Hindu Religion Gitanjali*. 1995.

<sup>7</sup> T. Subba. *The Lepchas: From legends to the present day*. Religion and Society, XXXII(2). 1985.

used by Lepcha groups along with medicinal uses of 44 Plants from Lepcha communities residing in the North Sikkim could be recorded. It was found that many of the respondents from the Lepcha community reflected a higher dependency on allopathy treatment over traditional folk health care programs. It may be associated with the strong and persistent time required for plant selection, lack of basic skills to identify medicinal plants correctly. The consistent improvement of sophisticated health systems and proximity to advanced treatment centers in cities and towns, as well as the availability of primary care centers and sub-centers in each village in recent years, have further distracted dependence from ethnomedical practice.<sup>1</sup>

Lepchas' utilization of local medicinal plants implies the consistency of traditional information regarding species and does have an obvious effect on defining the environments, enclosed within the somewhat challenging hill contour. The democratic reduction in traditional practices may cause these plants to fade away from related local culture soon. The expertise for identification of medicinal plants, among the Lepchas of Dzongu Valley is limited to a few old traditional practitioners. Their relocation to towns in search of better livelihood opportunities further undermines the younger generations' belief in bringing noble values. This disinterested trend in ancient knowledge is feared as a big cause by old generations to lose the wealth of information in the time ahead<sup>2</sup>.

The socioeconomic shift is substantial so the folk healers of the Sikkim Lepcha tribe, department of AYUSH, Govt of India actively attempted to revitalize the local traditions of health and folk healing practices through lectures and technology workshops.

Acharya et al. (2009)<sup>3</sup> published ground breaking work in this regard to concentrate on the indigenous expertise of the native, vanishing Lepcha tribe in identifying birds and checking the accuracy of the data they produce. Their study threw light on the abundance of Lepcha community indigenous knowledge for bird conservation. Intimate indigenous people aware of this fauna and flora group allowed them to coexist with their surroundings over multiple generations. The challenges are educating folk healers about their weaknesses and strengths, attracting young stars to adopt this profession with monetary benefits, and preserving knowledge and biodiversity.<sup>4</sup> In the face of modernization, indigenous knowledge and the role of folk healing practices and folk culture are not sufficiently respected. In this new millennium, the biggest challenge is to integrate the traditional knowledge with modern technology and medicine, the identification of molecules for use in modern medicine, the deceleration of the pace of environmental degradation and the ecological development of the region.

Overlooking past differences, and determined to change the course of history, now Lepchas refuse to accept yesterday's language. They accept their assertiveness and deny being the nearly extinct group in the hills. Today, none of the Lepchas accept that they are a "vanishing group" in any of the regions. They prefer to use the word "flourishing" rather than "vanishing" since they are all in the same Lepcha bandwagon to protect culture. They realized that the 'loss of faith, culture, tradition, language, and literature can only be recovered and preserved by the Lepchas themselves.<sup>5</sup> A deep sense of distinct entity seems to have taken root sanctuaries ago, among the Lepchas of the entire region-a sense created after independence by the special constitutional facilities that incurred to them. Education and its benefits had once shaped the division between Christian Lepchas and Buddhist Lepchas, but education today had enabled them to set aside their religion-based differences and work together for tribal development. Today, youth from Lepcha connect through social networking sites, across religious and regional boundaries to work together and assert their distinctive ethnicity.

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<sup>1</sup> D. Palit, & A. Banerjee. (2016). Traditional uses and conservative lifestyle of Lepcha tribe through sustainable bioresource utilization - Case studies from Darjeeling and north Sikkim, India. *International Journal of Conservation Science*, 7(3), p.p.735–752.

<sup>2</sup> B. K Pradhan, & H. K Badola, (2008). Ethnomedicinal plant use by Lepcha tribe of Dzongu valley, bordering Khangchendzonga Biosphere Reserve, in North Sikkim, India. *Journal of Ethnobiology and Ethnomedicine*, 4, p.p.1-18.

<sup>3</sup> B. K Acharya, B. Chettri, & L. Vijayan, (2009). Indigenous knowledge of Lepcha community for monitoring and conservation of birds. *Indian Journal of Traditional Knowledge*, 8(1), p.p.65–69.

<sup>4</sup> A. K Panda, & S. Misra, (2010). Health traditions of Sikkim Himalaya. *Journal of Ayurveda and Integrative Medicine*, 1(3), p.p.183–189.

<sup>5</sup> D. C Roy. 'Lepchas: Then and Now', Pano Gaeboo Achyok 2009: A Lepcha Bilingual Magazine. 2009. p.p.15–27.

## CONCLUSION

The Indigenous knowledge systems of the Lepchas seem to be undergoing social change with the first interactions with the Tibetans till date. Education is adapting to this present ethos. Education is one of the important agent or instrument for social change among the Lepchas in Sikkim. Education, as it stands for itself, raises a given set of situation into a new level of state with significant change. It awakens the human consciousness into a higher state and results in bringing change, a state where the standard of human understanding alters or modify into transforming setting. This subject of change further is both extensive and multifaceted by opposing meanings of good and bad. Social change occurs when humans guidance are increased through different kinds of agencies of education.

Education since the coming of the missionaries in Sikkim created a new set of ideas among the Lepchas as Dewan has pointed out that the Lepchas did not had a proper form of institution, be it in education or religion which is why they became a victim of change in Sikkim. To the Lepchas, knowledge is in the form of action, no matter how abstract it may appear, this is observed in their belief found in daily life. It means whatever they know is put into practice which is why there is no proper documentation of the Indigenous knowledge systems of the Lepchas. It is noted in the work of Ajit K. Roy that documentation is a major challenge because of the nature of the Indigenous knowledge as it is exchanged through personal communication from the keepers to the younger generation which is why in such cases, modern tools could be used but it is appropriate to rely on more traditional methods like getting it taped, narrated, drawings etc. ( Roy, 2013:645). The impact of modern education among the Lepchas in the present has brought changes in the practice of Indigenous knowledge systems but to be clear it is now that they are understanding the importance of the knowledge systems and urges to learn more and there is a growing need to preserve it. When it comes to education in Sikkim, where the presence of Indigenous Lepchas and their knowledge systems are still alive, it is important to introduce a traditional education institution where the younger minds could learn and understand their existing knowledge systems and are trained in order to document and preserve the culture of the Lepchas. This way, the younger minds, no matter how modernised they become due to the impact of modern education, they will gain Indigenous knowledge in a form of experiences and preserve their age-old tradition.

The knowledge about plants, animals, food preservation, climatic knowledge etc. are based on the experiences and narration of the people that have been passed down. The layered truth embedded in the stories of indigenous people is essential to cultural continuity and stories has important contributions to make in understanding Indigenous knowledge (Sette, 2011:436). The Indigenous knowledge systems of the Lepchas is rich, and the way of knowing is located in every individual as a collective identity of the community. Thus, Indigenous knowledge systems of the Lepchas on architecture, weaving, farming, hunting and fishing, medicine and healing practices in the form of knowledge is everywhere and such knowledge through lore needs to be used, challenged and adapted for local contexts.

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EXISTENCE AND UNIQUENESS OF A FUZZY SOLUTION FOR NONLINEAR SECOND ORDER NEUTRAL INTEGRODIFFERENTIAL EQUATION WITH INITIAL CONDITION

<sup>1</sup>M. Nagarajan and <sup>2</sup>K. Karthik

<sup>1</sup>Department of Mathematics, Nehru Institute of Technology, Coimbatore - 641 105, India

<sup>2</sup>Department of Mathematics, Kathir College of Arts and Science, Coimbatore - 641 062, India

ABSTRACT

In this paper, we devoted to study the existence and uniqueness of a fuzzy solution for nonlinear second order neutral integrodifferential Equation initial condition by using Banach fixed point theorem approach and using the fuzzy number whose values are normal, convex, upper semicontinuous, and compactly supported interval. Finally an example is provided to illustrate the application of the result.

Keywords

Ordinary differential equation;

Fuzzy sets;

Fixed point.

2010 AMSC:

33E30;

94D05;

47H10.

1. INTRODUCTION

A large class of scientific and engineering problems is modelled by partial differential equations, integral equations or coupled ordinary and partial differential equations which can be described as differential equations in infinite dimensional spaces using semigroups. In general functional differential equations or evolution equations serve as an abstract formulations of many partial differential equations which arise in problems connected with heatflow in materials with memory, viscoelasticity and many other physical phenomena. Mohit Kumar, Sandeep Kumar [19], Proved Controllability of impulsive second order semilinear fuzzy integrodifferential control systems with nonlocal initial conditions. B.Radhakrishnan, M.Nagarajan and S.Narayanamoorthy [20], Proved Existence Results for the Nonlinear First Order Fuzzy Neutral Integrodifferential Equations. In this paper, we study the the existence and uniqueness of fuzzy solution for nonlinear second order neutral integrodifferential equations of the form

$$\frac{d^2}{dt^2} (u(t) - h(t, u(t))) = Au(t) + \int_0^t k(t, s, u(s)) ds + f(t, u(t)), \quad t \in [0, b] \quad (1.1)$$

$$u(0) = u_0 \quad (1.2)$$

$$u'(0) = v_0 \quad (1.3)$$

Where  $A : J \rightarrow E_N$  is a fuzzy coefficient,  $E_N$  is the set of all upper semicontinuous convex normal fuzzy numbers with bounded  $\alpha$  - level intervals,  $f : J \times E_N \rightarrow E_N$ ,  $h : E_N \rightarrow E_N$  and  $k : J \times J \times E_N \rightarrow E_N$  are nonlinear continuous functions,  $\Psi(t)$  is an  $n \times n$  continuous matrix such that  $d^2G(t)u/dt^2$  is continuous for  $u \in E_N$  and  $t \in J$  with  $\|G(t)\| \leq K, K > 0$  with all nonnegative elements.

2. PRELIMINARIES

A fuzzy subset of  $R^n$  is defined in terms of a membership function which assigns to each point  $x \in R^n$  a grade of membership in the fuzzy set. Such a membership function is denoted by  $u : R^n \rightarrow [0,1]$ .

Throughout this paper, we assume that  $u$  maps  $R^n$  onto  $[0,1]$ ,  $[u]^0$  is a bounded subset of  $R^n$ ,  $u$  is upper semicontinuous, and  $u$  is fuzzy convex. We denote by  $E^n$  the space of all fuzzy subsets  $u$  of  $R^n$  which are normal, fuzzy convex, and upper semicontinuous fuzzy sets with bounded supports. In particular,  $E^1$  denotes the space of all fuzzy subsets  $u$  of  $R$ .

A fuzzy number  $a$  in real line  $R$  is a fuzzy set characterized by a membership function  $\aleph_a : R \rightarrow [0,1]$ .

A fuzzy number  $a$  is expressed as

$a = \int_{x \in R} \frac{\aleph_a}{x}$  with the understanding that  $\aleph_a(x) \in [0,1]$ , represents the grade of membership of  $x$  in  $a$  and  $\int$  denotes the union of  $\frac{\aleph_a}{x}$ .

**Definition 2.1** A fuzzy number  $a \in R$  is said to be convex if, for any real numbers  $x, y, z$  in  $R$  with  $x \leq y \leq z$ ,

$$\aleph_a(y) \geq \min\{\aleph_a(x), \aleph_a(z)\}$$

**Definition 2.2** The height of a fuzzy set is the largest membership value attained by any point.

**Definition 2.3** If the height of a fuzzy set equals one, then the fuzzy set is called normal. Thus, a fuzzy number  $a \in R$  is called normal, if the followings holds:

$$\max_x \aleph_a(x) = 1.$$

**Result 2.1** Let  $E_N$  be the set of all upper semicontinuous convex normal fuzzy numbers with bounded  $\alpha$ - level intervals. This means that if  $a \in E_N$ , then  $\alpha$  - level set

$$[a]^\alpha = \{x \in R : a(x) \geq \alpha, 0 \leq \alpha \leq 1\},$$

is a closed bounded interval, which we denote by

$$[a]^\alpha = [a_l^\alpha, a_r^\alpha]$$

and there exists a  $t_0 \in R$  such that  $a(t_0) = 1$ .

**Result 2.2[13]** Two fuzzy numbers  $a$  and  $b$  are called equal  $a = b$ , if  $\aleph_a(x) = \aleph_b(x)$ , for all  $x \in R$ . It follows that

$$a = b \iff [a]^\alpha = [b]^\alpha \text{ for all } \alpha \in (0, 1).$$

**Result 2.3[13]** A fuzzy number  $a$  may be decomposed into its level sets through the resolution identity

$$a = \int_0^1 \alpha [a]^\alpha,$$

where  $\alpha [a]^\alpha$  is the product of a scalar  $\alpha$  with the set  $[a]^\alpha$  and  $\int$  is the union of  $[a]^\alpha$  with  $\alpha$  ranging from 0 to 1.

**Definition 2.4** The support of a fuzzy set  $A$  in the universal set  $U$  is a crisp set that contains all the elements of  $U$  that have nonzero membership values in  $A$ , that is,

$$\text{supp}(A) = \{x \in U : \aleph_a(x) > 0\},$$

where  $\text{supp}(A)$  denotes the support of fuzzy set  $A$ . Hence the support  $\gamma_a$  of a fuzzy number  $a$  is defined, as a special case of level set, by the following:

$$\gamma_a = \{x : \aleph_a(x) > 0\}$$

**Definition 2.5** A fuzzy number  $a \in R$  is said to be positive if  $0 < a_1 < a_2$  holds for the support

$\gamma_a = [a_1, a_2]$  of  $a$ , that is,  $\gamma_a$  is in the positive real line. Similarly,  $a$  is called negative if  $0 \leq a_1 < a_2$  and zero if  $0 \leq a_1 \leq a_2$ .

**Lemma: 2.1 [17]** If  $a, b \in E_N$ , then for  $\alpha \in (0,1)$ ,

$$\begin{aligned} [a + b]^\alpha &= [a_q^\alpha + b_q^\alpha, a_r^\alpha + b_r^\alpha] \\ [ab]^\alpha &= [\min\{a_i^\alpha b_i^\alpha\}, \max\{a_i^\alpha b_i^\alpha\}], (i, j = q, r) \\ [a - b]^\alpha &= [a_l^\alpha - b_l^\alpha, a_r^\alpha - b_r^\alpha] \end{aligned}$$

**Lemma: 2.2 [17]** Let  $[a_q^\alpha, b_q^\alpha], 0 < \alpha \leq 1$ , be a given family of nonempty intervals. If  $[a_l^\beta, b_l^\beta] \subset [a_l^\alpha, b_l^\alpha]$  for all  $0 < \alpha \leq \beta$

$$[\lim_{k \rightarrow \infty} a_l^{\alpha k}, \lim_{k \rightarrow \infty} a_r^{\alpha k}] = [a_l^\alpha, a_r^\alpha],$$

whenever  $(\alpha_k)$  is a nondecreasing sequence converging to  $\alpha \in [0,1]$ , then the family  $[a_l^\alpha, a_r^\alpha]$ ,  $0 < \alpha \leq 1$  are the  $\alpha$ -level sets of a fuzzy number  $a \in E_N$ .

Let  $x$  be a point in  $R^n$  and  $A$  be a nonempty subset of  $R^n$ . We define the Hausdroff separation of  $B$  from  $A$  by

$$d(x, A) = \inf\{\|x - a\| : a \in A\}$$

Now let  $A$  and  $B$  be nonempty subsets of  $R^n$ . We define the Hausdroff separation of  $B$  from  $A$  by  $d_H^*(B, A) = \sup\{d(b, A) : b \in B\}$ .

In general,

$$d_H^*(A, B) \neq d_H^*(B, A)$$

We define the Hausdroff distance between nonempty subsets of  $A$  and  $B$  of  $R^n$  by

$$d_H(A, B) = \max\{d_H^*(A, B), d_H^*(B, A)\}$$

This is now symmetric in  $A$  and  $B$ . Consequently,

1.  $d_H(A, B) \geq 0$  with  $d_H(A, B) = 0$  if and only if  $\bar{A} = \bar{B}$ ;
2.  $d_H(A, B) = d_H(B, A)$ ;
3.  $d_H(A, B) \leq d_H(A, C) + d_H(C, B)$ ;

for any nonempty subsets of  $A, B$  and  $C$  of  $R^n$ . The Hausdroff distance is a metric, the Hausdroff metric.

The supremum metric  $d_\infty$  on  $E^n$  is defined by

$$d_\infty(u, v) = \sup\{d_H([u]^\alpha, [v]^\alpha) : \alpha \in (0,1)\}$$

and is obviously metric on  $E^n$ .

The supremum metric  $H_1$  on  $C(J, E^n)$  is defined by

$$H_1(x, y) = \sup\{d_\infty(x(t), y(t)) : t \in J, \text{ for all } x, y \in C(J; E^n)\}.$$

### 3 . EXISTENCE AND UNIQUENESS OF FUZZY SOLUTION

In this section, we consider the existence and uniqueness of the fuzzy solution for nonlinear second order fuzzy neutral integrodifferential equations with initial conditions:

$$\frac{d^2}{dt^2} (u(t) - h(t, u(t))) = Au(t) + \int_0^t k(t, s, u(s)) ds + f(t, u(t)), \quad t \in [0, b] \quad (3.1)$$

$$u(0) = u_0 \quad (3.2)$$

$$u'(0) = v_0 \quad (3.3)$$

where  $A : J \rightarrow E_N$  is a fuzzy coefficient,  $E_N$  is the set of all upper semicontinuous convex normal fuzzy numbers with bounded  $\alpha$ -level intervals,  $f : J \times E_N \rightarrow E_N$ ,  $h : E_N \rightarrow E_N$  and  $k : J \times J \times E_N \rightarrow E_N$  are nonlinear continuous functions and satisfy a global Lipschitz condition, that is, there exist a finite constant  $l_f, l_h$  and  $l_k$  such that

$$(H1) \quad d_H([f(s, u(s))]^\alpha, [f(s, v(s))]^\alpha) \leq l_f d_H([u(s)]^\alpha, [v(s)]^\alpha)$$

$$(H2) \quad d_H([k(t, s, u(s))]^\alpha, [k(t, s, v(s))]^\alpha) \leq l_k d_H([u(s)]^\alpha, [v(s)]^\alpha)$$

$$(H3) \quad d_H([h(t, u(s))]^\alpha, [h(t, v(s))]^\alpha) \leq l_h d_H([u(s)]^\alpha, [v(s)]^\alpha)$$

for all  $u_1(t), u_2(t) \in E_N$ . Let  $I$  be an interval. A mapping  $u : J \rightarrow E_N$  of a fuzzy process  $u$ , then

$$u'(t) = [(u_l^\alpha)', (u_r^\alpha)'] \mathbf{0} < \alpha \leq 1$$

The fuzzy integral

$$\int_a^b u(t) dt, \quad a, b \in J$$

is defined by  $\int_a^b [u(t)]^\alpha = [\int_a^b u_l^\alpha, \int_a^b u_r^\alpha]$ , provided Lebesgue integrals on the right exist.

**Theorem 3.1** Let  $b > 0$ ,  $f$ ,  $g$  and  $k$  satisfy a global Lipschitz condition, for every  $u_0 \in E_N$  then the second order fuzzy neutral integrodifferential equation with initial condition (3.1) - (3.3) has a unique solution  $u_0 \in C(J, E_N)$ .

**Proof.** For each  $u(t) \in E_N, t \in J$ .

$$(F_0 u(t)) = C(t)(u_0 - h(0, u_0) + S(t)(v_0 - h(0, v_0) + h(s, u(s)) + \int_0^t S(t-s)h(s, u(s))ds + \int_0^t S(t-s) \left( \int_0^s k(s, r, u(r)) dr \right) ds + \int_0^t S(t-s)f(s, u(s))ds$$

Where  $S(t)$  and  $C(t)$  are a fuzzy numbers and  $[S(t)]^\alpha = [S_l^\alpha(t), S_r^\alpha(t)]$

$$= [\exp\{\int_0^t a_l^\alpha(s)\}, \exp\{\int_0^t a_r^\alpha(s)\}],$$

Similarly

$$[C(t)]^\alpha = [C_l^\alpha(t), C_r^\alpha(t)]$$

and  $S_i^\alpha(t), C_i^\alpha(t) (i = q, r)$  are continuous. That is, there exist a constant  $l_s > 0, l_c > 0$  such that  $|S_i^\alpha(t)| \leq l_s, |C_i^\alpha(t)| \leq l_c$ , for all  $t \in J$ . Thus  $F_0 u: J \rightarrow E_N$  is continuous,  $F_0: C(J, E_N) \rightarrow C(J, E_N)$ . For  $u, v \in C(J, E_N)$  we have

$$\begin{aligned} & d_H([F_0 u(t)]^\alpha, [F_0 v(t)]^\alpha) \\ &= d_H([C(t)(u_0 - h(0, u_0) + S(t)(v_0 - h(0, u_0) + h(t, u(s)) + \int_0^t S(t-s)h(s, u(s))ds + \int_0^t S(t-s) \left( \int_0^s k(s, r, u(s)) dr \right) ds + \int_0^t S(t-s)f(s, u(s))ds]^\alpha, [C(t)(u_0 - h(0, u_0) + S(t)(v_0 - h(0, u_0) + h(t, v(t)) + \int_0^t S(t-s)h(s, v(s))ds + \int_0^t S(t-s) \left( \int_0^s k(s, r, v(s)) dr \right) ds + \int_0^t S(t-s)f(s, v(s))ds]^\alpha) \\ &= d_H([C(t)(u_0 - h(0, u_0)]^\alpha + [S(t)(v_0 - h(0, u_0)]^\alpha + [h(t, u(t))]^\alpha + \left[ \int_0^t S(t-s)h(s, u(s))ds \right]^\alpha + \left[ \int_0^t S(t-s) \left( \int_0^s k(s, r, u(s)) dr \right) ds \right]^\alpha + \left[ \int_0^t S(t-s)f(s, u(s))ds \right]^\alpha, [C(t)(u_0 - h(0, u_0)]^\alpha + [S(t)(v_0 - h(0, u_0)]^\alpha + [h(t, v(t))]^\alpha + \left[ \int_0^t S(t-s)h(s, v(s))ds \right]^\alpha + \left[ \int_0^t S(t-s) \left( \int_0^s k(s, r, v(s)) dr \right) ds \right]^\alpha + \left[ \int_0^t S(t-s)f(s, v(s))ds \right]^\alpha) \\ &\leq d_H([h(t, u(t))]^\alpha, [h(t, v(t))]^\alpha) + d_H\left(\left[ \int_0^t S(t-s)h(s, u(s))ds \right]^\alpha, \left[ \int_0^t S(t-s)h(s, v(s))ds \right]^\alpha\right) \\ &\quad + d_H\left(\left[ \int_0^t S(t-s) \left( \int_0^s k(s, r, u(s)) dr \right) ds \right]^\alpha, \left[ \int_0^t S(t-s) \left( \int_0^s k(s, r, v(s)) dr \right) ds \right]^\alpha\right) \\ &\quad + d_H\left(\left[ \int_0^t S(t-s)f(s, u(s))ds \right]^\alpha, \left[ \int_0^t S(t-s)f(s, v(s))ds \right]^\alpha\right) \end{aligned}$$

$$\begin{aligned}
 &= \max \left\{ |h_l^\alpha(t, u(t)) - h_l^\alpha(t, v(t))|, \right. \\
 &\quad \left. |h_r^\alpha(t, u(t)) - h_r^\alpha(t, v(t))| \right\} \\
 &+ \int_0^t \max \{ |S_l^\alpha(t-s)(h_l^\alpha(s, u(s)) - h_l^\alpha(s, v(s)))|, |S_r^\alpha(t-s)(h_r^\alpha(s, u(s)) - h_r^\alpha(s, v(s)))| \} ds \\
 &\quad + \int_0^t \max \left\{ \left| S_l^\alpha(t-s) \left( \int_0^s k_l^\alpha(s, r, u(s)) dr - \int_0^s k_l^\alpha(s, r, v(s)) dr \right) \right|, \right. \\
 &\quad \left. \left| S_r^\alpha(t-s) \left( \int_0^s k_r^\alpha(s, r, u(s)) dr - \int_0^s k_r^\alpha(s, r, v(s)) dr \right) \right| \right\} ds \\
 &+ \int_0^t \max \{ |S_l^\alpha(t-s)(f_l^\alpha(s, u(s)) - f_l^\alpha(s, v(s)))|, |S_r^\alpha(t-s)(f_r^\alpha(s, u(s)) - f_r^\alpha(s, v(s)))| \} ds \\
 &\quad = \max \{ |h_l^\alpha(t, u(t)) - h_l^\alpha(t, v(t))|, |h_r^\alpha(t, u(t)) - h_r^\alpha(t, v(t))| \} \\
 &+ \int_0^t \max \{ |S_l^\alpha(t-s)| |(h_l^\alpha(s, u(s)) - h_l^\alpha(s, v(s)))|, |S_r^\alpha(t-s)| |(h_r^\alpha(s, u(s)) - h_r^\alpha(s, v(s)))| \} ds \\
 &+ \int_0^t \max \left\{ |S_l^\alpha(t-s)| \left| \int_0^s k_l^\alpha(s, r, u(s)) dr - \int_0^s k_l^\alpha(s, r, v(s)) dr \right|, |S_l^\alpha(t-s)| \left| \int_0^s k_l^\alpha(s, r, u(s)) dr \right. \right. \\
 &\quad \left. \left. - \int_0^s k_l^\alpha(s, r, v(s)) dr \right| \right\} ds \\
 &+ \int_0^t \max \{ |S_l^\alpha(t-s)| |(f_l^\alpha(s, u(s)) - f_l^\alpha(s, v(s)))|, |S_r^\alpha(t-s)| |(f_r^\alpha(s, u(s)) - f_r^\alpha(s, v(s)))| \} ds \\
 &\quad = \max \{ |h_l^\alpha(t, u(t)) - h_l^\alpha(t, v(t))|, |h_r^\alpha(t, u(t)) - h_r^\alpha(t, v(t))| \} \\
 &+ \int_0^t \max \{ |S_l^\alpha(t-s)| |(h_l^\alpha(s, u(s)) - h_l^\alpha(s, v(s)))|, |S_r^\alpha(t-s)| |(h_r^\alpha(s, u(s)) - h_r^\alpha(s, v(s)))| \} ds \\
 &\quad + \int_0^t \max \left\{ |S_l^\alpha(t-s)| \left| \int_0^s k_l^\alpha(s, r, u(s)) dr - \int_0^s k_l^\alpha(s, r, v(s)) dr \right|, \right. \\
 &\quad \left. |S_r^\alpha(t-s)| \left| \int_0^s k_r^\alpha(s, r, u(s)) dr - \int_0^s k_r^\alpha(s, r, v(s)) dr \right| \right\} ds \\
 &+ \int_0^t \max \{ |S_q^\alpha(t-s)| |(f_l^\alpha(s, u(s)) - f_l^\alpha(s, v(s)))|, |S_r^\alpha(t-s)| |(f_r^\alpha(s, u(s)) - f_r^\alpha(s, v(s)))| \} ds \\
 &\leq \max \{ |h_l^\alpha(u(s)) - h_l^\alpha(v(s))|, |h_r^\alpha(u(s)) - h_r^\alpha(v(s))| \} \\
 &\quad + l_s \int_0^t \max \{ |h_l^\alpha(s, u(s)) - f_l^\alpha(s, v(s))|, |h_r^\alpha(s, u(s)) - f_r^\alpha(s, v(s))| \} \\
 &\quad + l_s \int_0^t \max \{ \left| \int_0^s k_l^\alpha(s, r, u(s)) dr - \int_0^s k_l^\alpha(s, r, v(s)) dr \right|, \left| \int_0^s k_r^\alpha(s, r, u(s)) dr \right. \\
 &\quad \left. - \int_0^s k_r^\alpha(s, r, v(s)) dr \right| \} \\
 &\quad + l_s \int_0^t \max \{ |f_l^\alpha(s, u(s)) - f_l^\alpha(s, v(s))|, |f_r^\alpha(s, u(s)) - f_r^\alpha(s, v(s))| \} \\
 &\quad \leq l_h d_H([u(s)]^\alpha, [v(s)]^\alpha) + l_s l_h \int_0^t d_H([u(s)]^\alpha, [v(s)]^\alpha) ds \\
 &\quad + l_s l_k b \int_0^t d_H([u(s)]^\alpha, [v]^\alpha) ds + l_s l_f \int_0^t d_H([u(s)]^\alpha, [v_t]^\alpha) ds + l_s d_H([u(s)]^\alpha, [v(s)]^\alpha)
 \end{aligned}$$

$$\begin{aligned}
 &= (l_h + l_s)d_H([u(s)]^\alpha, [v]^\alpha) + l_s(l_k b + l_h + l_f) \int_0^t d_H([u(s)]^\alpha, [v]^\alpha) ds \\
 &= L_1 d_H([u(s)]^\alpha, [v(s)]^\alpha) + L_2 \int_0^t d_H([u(s)]^\alpha, [v(s)]^\alpha) ds. \\
 &\text{where } L_1 = l_h + l_s, L_2 = l_s(l_k b + l_h + l_f)
 \end{aligned}$$

Therefore

$$\begin{aligned}
 d_\infty(F_0 u(t), F_0 v(t)) &= \sup_{t \in J} \{d_H([F_0 u(t)]^\alpha, [F_0 v(t)]^\alpha)\} \\
 &\leq \sup_{t \in J} \{L_1 d_H([u(t)]^\alpha, [v(t)]^\alpha) + L_2 \int_0^t d_H([u(t)]^\alpha, [v(t)]^\alpha) ds\} \\
 &= L_1 \sup_{t \in J} \{d_H([u(t)]^\alpha, [v]^\alpha)\} + L_2 \sup_{t \in J} \{\int_0^t d_H([u(t)]^\alpha, [v(t)]^\alpha) ds\} \\
 &\leq L_1 d_\infty([u(t)]^\alpha, [v_s]^\alpha) + L_2 \int_0^t d_\infty([u(t)]^\alpha, [v(t)]^\alpha) ds
 \end{aligned}$$

Hence

$$\begin{aligned}
 H_1(F_0[u(t), F_0 v_s]) &= \sup_{t \in J} (d_\infty F_0[u(t), F_0 v(t)]) \\
 &\leq \sup_{t \in J} \{L_1 d_\infty([u(t)]^\alpha, [v(t)]^\alpha) + L_2 \int_0^t d_\infty([u(t)]^\alpha, [v(t)]^\alpha) ds\} \\
 &= L_1 \sup_{t \in J} \{d_\infty([u(t)]^\alpha, [v(t)]^\alpha)\} + L_2 \sup_{t \in J} \{\int_0^t d_\infty([u(t)]^\alpha, [v(t)]^\alpha) ds\} \\
 &\leq (L_1 + L_2) H_1(u(t), v(t))
 \end{aligned}$$

We take sufficiently small  $b$ ,  $(L_1 + L_2)b < 1$ . Hence,  $F_0$  is a contraction mapping. By the Banach fixed point theorem, fuzzy neutral integrodifferential equation has a unique fixed point  $u \in C(J, E_N)$ .

**4. Example**

Consider the fuzzy solution of the nonlinear fuzzy neutral integrodifferential equation of the form:

$$\frac{d^2}{dt^2} (u(t) - 3u(t)^2) = 3u(t) + 3tu(t)^2 + 3tu(t)^2, \quad t \in J, \tag{4.1}$$

$$u(t, 0) = u'(t, 1) = 0 \tag{4.2}$$

The  $\alpha$  - level set of fuzzy number  $\mathbf{0}$  is

$$[\mathbf{0}]^\alpha = [\alpha - 1, 1 - \alpha], \text{ for } \alpha \in [0, 1]$$

The  $\alpha$  - level set of fuzzy number  $\mathbf{3}$  is

$$[\mathbf{3}]^\alpha = [\alpha + 2, 4 - \alpha], \text{ for } \alpha \in [0, 1]$$

Let  $\int_0^t k(t, s, u(s)) ds = 3tu(t)^2$ ,  $f(t, u(t)) = 3tu(t)^2$ ,  $h(u(t)) = 3tu(t)^2$  Then  $\alpha$  - level set of  $\int_0^t k(t, s, u(s)) ds = 3tu(t)^2$  is

$$\begin{aligned}
 [\int_0^t k(t, s, u(s)) ds]^\alpha &= [3tu(t)^2]^\alpha = t[3]^\alpha [u(t)^2]^\alpha \\
 &= t[\alpha + 2, 4 - \alpha] [(u_q^\alpha(t))^2, (u_r^\alpha(t))^2] \\
 &= t[(\alpha + 2)(u_r^\alpha(t))^2, (4 - \alpha)(u_q^\alpha(t))^2] \\
 &\text{where } [u(t)]^\alpha = [u_l^\alpha(t), u_r^\alpha(t)] \text{ and } [3]^\alpha = [\alpha + 2, 4 - \alpha], \text{ for } \alpha \in [0, 1]
 \end{aligned}$$

and the  $\alpha$  - level set of  $f(t, u(t))$  is

$$\begin{aligned}
 [f(t, u(t))]^\alpha &= [3tu(t)^2]^\alpha = t[3]^\alpha [u(t)^2]^\alpha \\
 &= t[\alpha + 2, 4 - \alpha] [(u_q^\alpha(t))^2, (u_r^\alpha(t))^2]
 \end{aligned}$$

$$= t[(\alpha + 2)(u_r^\alpha(t))^2, (4 - \alpha)(u_r^\alpha(t))^2]$$

where  $[u(t)]^\alpha = [u_q^\alpha(t), u_r^\alpha(t)]$  and  $[3]^\alpha = [\alpha + 2, 4 - \alpha]$ , for  $\alpha \in [0,1]$

and the  $\alpha$  - level set of  $h(u(t))$  is

$$[h(t, u(t))]^\alpha = [3tu(t)^2]^\alpha = t[3]^\alpha [u(t)^2]^\alpha$$

$$= t[\alpha + 2, 4 - \alpha][(u_l^\alpha(t))^2, (u_r^\alpha(t))^2]$$

$$= t[(\alpha + 2)(u_r^\alpha(t))^2, (4 - \alpha)(u_r^\alpha(t))^2]$$

where  $[u(t)]^\alpha = [u_l^\alpha(t), u_r^\alpha(t)]$  and  $[3]^\alpha = [\alpha + 2, 4 - \alpha]$ , for  $\alpha \in [0,1]$

$$d_H([f(u(t))]^\alpha, [f(v(t))]^\alpha)$$

$$= d_H(t[(\alpha + 2)(u_l^\alpha(t))^2, (4 - \alpha)(u_r^\alpha(t))^2],$$

$$(t[(\alpha + 2)(v_l^\alpha(t))^2, (4 - \alpha)(v_r^\alpha(t))^2])$$

$$= t \max\{(\alpha + 2) |(u_l^\alpha(t))^2 - (v_l^\alpha(t))^2|, (4 - \alpha) |(u_r^\alpha(t))^2 - (v_r^\alpha(t))^2|\}$$

$$= t \max\{(\alpha + 2) |u_l^\alpha(t) + v_l^\alpha(t)|, |u_l^\alpha(t) - v_l^\alpha(t)|, (4 - \alpha)$$

$$|u_r^\alpha(t) + v_r^\alpha(t)|, |u_r^\alpha(t) - v_r^\alpha(t)|\}$$

$$\leq (4 - \alpha)b |u_r^\alpha(t) + v_r^\alpha(t)| \max\{|u_q^\alpha(t) - v_q^\alpha(t)|, |u_r^\alpha(t) - v_r^\alpha(t)|\}$$

$$\leq 4b |u_r^\alpha(t) + v_r^\alpha(t)| \max\{|u_q^\alpha(t) - v_q^\alpha(t)|, |u_r^\alpha(t) - v_r^\alpha(t)|\}$$

$$= l_f d_H([u(t)]^\alpha, [u(t)]^\alpha)$$

where  $l_f = 2b |u_r^\alpha(t) + v_r^\alpha(t)$

$$d_H([\int_0^t k(t, s, u(s)) ds]^\alpha, [\int_0^t k(t, s, u(s)) ds]^\alpha)$$

$$= d_H(t[(\alpha + 2)(u_q^\alpha(t))^2, (4 - \alpha)(u_r^\alpha(t))^2], (t[(\alpha + 2)(v_q^\alpha(t))^2, (4 -$$

$$\alpha)(v_r^\alpha(t))^2]$$

$$= t \max\{(\alpha + 2) |(u_q^\alpha(t))^2 - (v_q^\alpha(t))^2|, (4 - \alpha) |(u_r^\alpha(t))^2 - (v_r^\alpha(t))^2|\}$$

$$= t \max\{(\alpha + 2) |u_q^\alpha(t) + v_q^\alpha(t)|, |u_q^\alpha(t) - v_q^\alpha(t)|, (4 - \alpha) |u_r^\alpha(t) + v_r^\alpha(t)|,$$

$$|u_r^\alpha(t) - v_r^\alpha(t)|\}$$

$$\leq (4 - \alpha)t |u_r^\alpha(t) + v_r^\alpha(t)| \max\{|u_q^\alpha(t) - v_q^\alpha(t)|, |u_r^\alpha(t) - v_r^\alpha(t)|\}$$

$$\leq (4 - \alpha)b |u_r^\alpha(t) + v_r^\alpha(t)| \max\{|u_q^\alpha(t) - v_q^\alpha(t)|, |u_r^\alpha(t) - v_r^\alpha(t)|\}$$

$$\leq 4b |u_r^\alpha(t) + v_r^\alpha(t)| \max\{|u_q^\alpha(t) - v_q^\alpha(t)|, |u_r^\alpha(t) - v_r^\alpha(t)|\}$$

$$= l_f b d_H([u(t)]^\alpha, [v(t)]^\alpha)$$

Therefore,  $f$ ,  $k$  and  $h$  are satisfies the global Lipschitz conditions and choose  $b$  is sufficiently small. Then all conditions stated in Theorem 3.1 are satisfied, so the problem (4.1)-(4.2) has a unique fuzzy solution.

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**GREEN CHEMISTRY IN DAY TO DAY LIFE IS NEED OF 21 CENTURY****Sau. Chhaya Sharadchandra Karle**

Department of Chemistry, Arts, commerce and Science college, Satral, Tal- Rahuri, Ahmednagar, 413713 (MS), India (Affiliated to Savitribai Phule Pune University, Pune)

**ABSTRACT**

*Green chemistry is the concept of pollution prevention and zero waste for healthy life of environment and good economical status. It increases challenges in industry, education and research. As well as reduces damage of environment due to careless activities of human. Hence disposal of waste in correct manner, waste less product formation is need of 21 century. First need to change the mind of people, create awareness about environment in people in because healthy mind always think positively that is greenly. Positive mind is always creative mind.*

*Keywords: Environment, Green chemistry, Sustainability, Ozone.*

**INTRODUCTION****Green Chemistry**

Sustainable and green chemistry means thinking about the design, development and implementation of chemical products and processes. to protect and benefit the economy, people and the planet by finding creative and innovative ways to reduce waste, conserve energy, and discover replacements for hazardous substances.[1,2]

Green chemistry related to hazards from chemical toxicity and includes energy conservation, waste reduction. Green chemistry considers sustainable chemistry, use of renewable feedstock's and designing green the product.

Green chemistry includes mass, energy, hazardous substance reduction or elimination, and life cycle environmental impacts. [3]

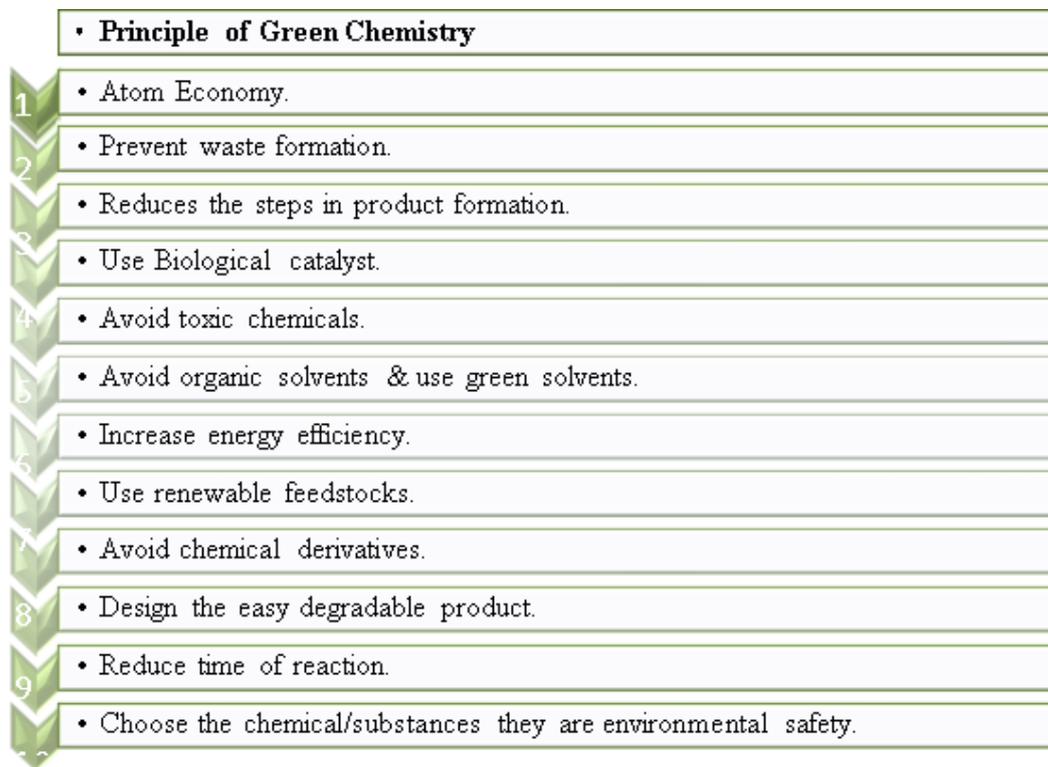
**Global Warming:**

This is real condition of earth health. Why human can't understand this situation? Why we people becomes selfish and cross the limit of cruelty.

- It is due to use of hazardous chemicals.
- Releasing waste in river water.
- Non degradable products.
- Use of auxiliary substances.
- Use of non renewable energy sources.
- Use of plastic.
- Deforestation.
- Over fishing.
- Use of chemicals, pesticide, fertilizers for crop. It increases soil pollution.
- Large use of fuels increases air pollution.
- Burning of fuels increases percentage of carbon dioxide in air. It increases atmospheric temperature means increases global warming.

- As global warming increases it reduces ozone layer.
- Due to all above point's earth in crises.

To stop global warming always follow twelve principle of green chemistry.



### Green chemistry is important in day to day life, because there is a big blast of pollution

Everywhere on earth, in air, in space, in water. A contaminated food is also available in market it causes serious effect on health.[4,5,6,7]

#### For example:

##### Human health:

- If air contains less hazardous chemicals then less damage to health.
  - Non polluted water or waste free water is available for drinking purpose.
  - Less use of toxic materials use in industrial product formation increases safety for workers.
- [8,9]

##### Environment:

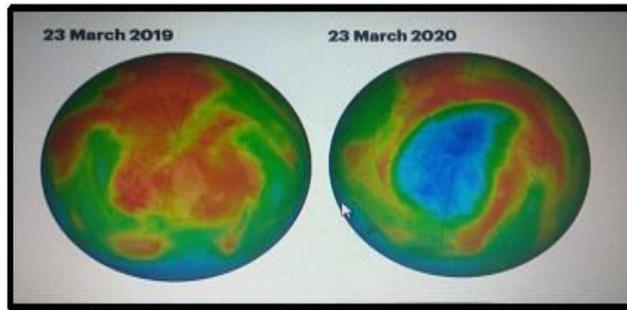
In green chemistry biodegradable waste is form it protect environment. Use green concept and save environment.

##### Economy and business:

- By using renewable sources of energy, raw material we can save money and increases economic status of our country.
- Comparative study of synthetic chemistry Vs green chemistry –
- Synthetic chemistry – Increases pollution.
- Green chemistry – Decreases pollution.
- Following are the Proofs collected from study article, Google scholar, photographs from NASA during pandemic COVID-19(in lockdown period).
- In short in lockdown period there is no vehicles on road (no pollution due to fuel), airplane services are stop (no fuel pollution in air), some industries are closed completely form few month, so no discharge of waste in river water, no release of poisonous gases in air. Means no pollution. This pollution free

atmosphere shows miracles- related to Earth,Water,Air, Ozone layer increases.[10,11]

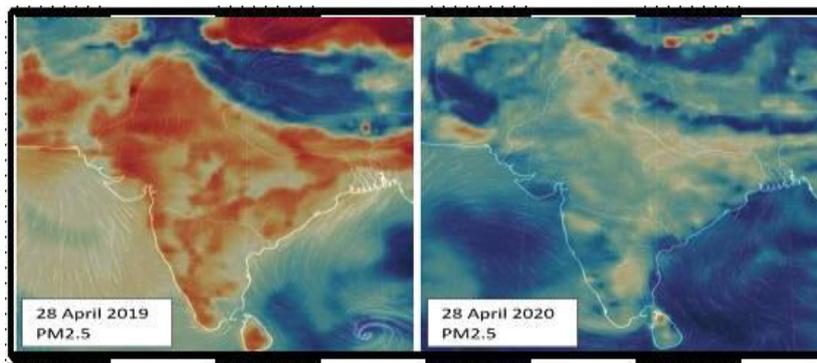
**Effect on Ozone Layer:**



Day by day Ozone depletion is caused due to release of various gases from different industry. Ozone depletion causes more UVB radiation (shorter wavelength radiations) reaching the Earth’s surface. UVB causes skin cancer and eye disease, also it affects plant life and reduction of plankton (Phytoplankton are microscopic marine algae.) in marine environment.

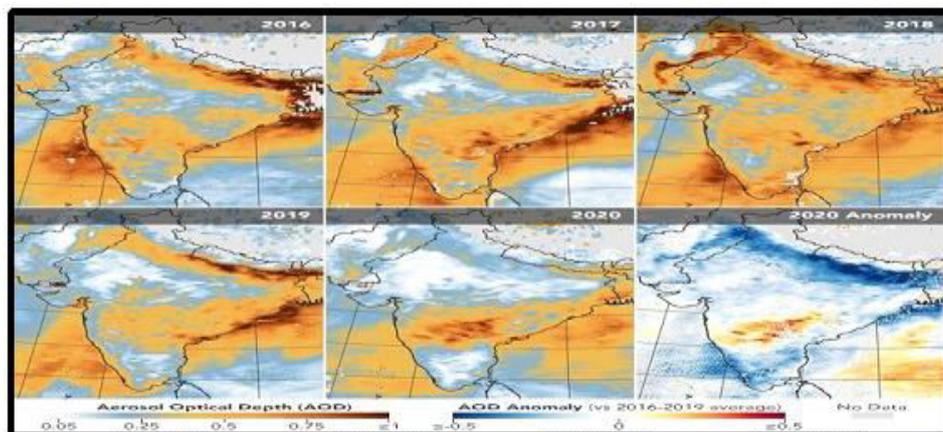
But due to the COVID-19 pandemic environment itself repair the ozone layer. Means no pollution, no ozone depletion, no global warming.[NASA]

**Effect on Pollution level:**



As pollution in environment decreases, it increases green effect on earth.[NASA]

**Aerosols:**



Aerosols is human-made sources to increase levels of air pollution in many Indian cities. They are tiny solid and liquid particles suspended in the air it reduce visibility and can damage the human lungs and heart. There are some natural sources of aerosols, such as dust storms, volcanic eruptions, and forest fires. Human activities, like burning of fossil fuels and land used for growing crops. All have greater potential for damaging human health.

**But due to the COVID-19 pandemic** The first five maps below show aerosol optical depth (AOD) measurements over India during the same March 31 to April 5 period for each year from 2016 through 2020.

Above map shows comparative situation of AOD from 2016 to 2020. Aerosol optical depth is a measure of how light is absorbed or reflected by airborne particles as it travels through the atmosphere. If aerosols are concentrated near the surface, an optical depth of 1 or above indicates very hazy conditions. An optical depth, or thickness, is less than 0.1 over the entire atmospheric vertical column is considered “clean.” The data were retrieved by the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA’s Terra satellite.

**Compare the environment before and after lockdown period :( images collect from Google)**

**Before lockdown**



**A view of Milan, Italy, on January 8, 2020.**

**After lockdown**



**A view of Milan, Italy, on April 17, 2020.**



**The India Gate war memorial in New, Delhi India, on October 17, 2019. Before lockdown**



**The India Gate war memorial in New Delhi India, on April 8, 2020. After lockdown**



New Delhi, India, on November 8, 2018.



New Delhi, India, on April 8, 2020

we could see long-lasting positive environmental change after the pandemic. Means lot of pollution in environment but in lockdown period no air pollution due to industry, vehicles, airplanes etc. That is nature itself repair their parts.

**Effect on water:**



**Solid waste in sea water**



**Puri Ghat, Haridwar(Lockdown period)**

Due to Corona virus continuous in lockdown period the water quality of Ganga & Yamuna improved. Increase in dissolved oxygen and decrease nitrate concentration<sup>29</sup> April (India news). On April 27, the CPCB said that the Ganga water can support aquatic life. However, it certainly is not clean enough for drinking. It also pointed out that the nitrate concentration of the Ganga water reduced too.

1. he quint report said that in Varanasi's Nagwa Nala, the measure of DO increased from 3.8 ML/L on March 6 to 6.8 ML/L on April 4, it means water itself improve its quality.(live mint 29 april 2020 e-paper)

**Awareness towards environment protection is great need of 21 century. Hence the word Green is important in our day to day life.**

**CONCLUSION**

**Each Indian takes pledge everyday–**

- I will protect the ecosystem from harmful chemicals.
- I will not throw garbage in the open/street.
- I will not use plastic.
- I will save water every day.
- I will not throw garbage in the water and in public places.
- I will not throw garbage, plastic in rivers, streams, seas etc.
- I will not use packing foods.
- I will save fuel. I will use bicycle if needed.
- I will save food, light, water & environment.
- I will use natural resources carefully..

**Advantages of green planning:**

- It increases economic status as well as living standards.
- It caused considerable environmental degradation.
- It causes climate change, the repairing of ozone layer.
- It decreases accumulation of non-destructive organic pollutants.
- Due to change in designing process of organic synthesis, it reduces byproduct/waste generation.
- Environment safety increases due to reduction use of hazardous chemicals/raw materials.
- Energy consumes due to use of renewable raw materials hence energy efficiency increases.
- Degradable chemical products decrease environmental pollution.
- Ecofriendly environment decreases pollution.
- Green chemistry has scientific discipline, interdisciplinary approach, chemical, ecological and social responsibility, creativity.
- Green chemistry is a Hippocratic Oath for chemists, in order to preserve natural resources and the environment for new generation.[13to17].
- Green chemistry in day to day life is need of 21 century
- Like food, shelter and cloth green concept, green thinking is important in day to day life and for 21 century.



**Save Earth, Save Water**

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**ONLINE TEACHING: TECHNICAL CHALLENGES BEFORE TEACHER'S AND STUDENTS.**

**Dr. Sunita Hansraj Ambawade**

Assistant Professor, Shri Venkatesh Mahavidyalaya, Ichalkaranji

**ABSTRACT**

*When educational institutions were starts at the start of the coronavirus pandemic in the country, not many reckoned it would change the face of education as we have all known from a no smart phones allowed in school to learning only with sum devices at home, it has been massive change that everyone involved –teachers, students and parents . Technology driven world has touched almost all the fields and all the aspects of life . There has been a technological transmission in the field of education as well, E-learning has become a crucial aspect of the educational system.*

*The objectives of the study are To study to technical challenges faced by the teacher ‘s while online teaching and To study to technical challenges before students. Keeping in view the present scenario an online survey was conducted to study the challenges faced by teachers during online teaching. The data was collected with the help of a questionnaire constructed by investigators*

*Findings of the survey revealed that about most of the teachers are taking online classes for the first time. Lack of appropriate materials and resources, Technical problems, Lack of in service training, difficulty in assembling all the students for the class, Lack of cooperation from the parents, Lack of internet facilities to the students, difficulty to follow up the learning of students are the major challenges faced by them. Further, teachers have a highly positive and favourable attitude towards on line teaching but due to lack of efficacy and training in online mode of teaching they feel that they can teach better in traditional teaching.*

*Key words: E-learning, online mode, service training.*

**INTRODUCTION**

When educational institutions were starts at the start of the coronavirus pandemic in the country, not many reckoned it would change the face of education as we have all known from a no smart phones allowed in school to learning only with sum devices at home, it has been massive change that everyone involved –teachers, students and parents . Technology driven world has touched almost all the fields and all the aspects of life . There has been a technological transmission in the field of education as well, E-learning has become a crucial aspect of the educational system.

The objectives of the study are

1. To study to technical challenges faced by the teacher‘s while online teaching and
2. To study to technical challenges before students.

**RESEARCH METHODOLOGY**

*Keeping in view the present scenario an online survey was conducted to study the challenges faced by teachers during online teaching. The data was collected from 30 teachers and 250 students with the help of a questionnaire constructed by investigators.*

**DATA ANALYSIS**

**Questionnaire for teachers**

**1.1. Table showing the opinion of the teachers and students about the online teaching and challenges before teachers and students**

Particulars	Strongly D.A(1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
<b>FOR TEACHERS</b>					
Do you have android mobile					100%

you have high-speed internet at home		20%		80%	
What device do you use for distance learning =laptop,				5%	
desktop,				5%	
, smartphone					90%
I am satisfied with the technology and software you are using for online teaching		5%	15%	60%	20%
our college has been offering you the resources to teach from home	20%	10%		50%	20%
our co-workers/friends have been helped while teaching from home			10%	80%	10%
your experience of teaching students from home as compared to teaching at college was very good	30%	40%		30%	
i find that teaching remotely during the COVID-19 pandemic was very stressful		20%		70%	10%
I use photos, charts, models etc. during my online lectures for making learning more joyful and effective for the students	10%	10%		70%	10%
After online lectures i don't mind for taking students questions via WhatsApp, email, phone call etc.				90%	10%
I attach with my online classes links of more informative reading websites that will help them to explore more with the topic.				80%	20%
In comparison to my real world classroom, my online classes are making students to ask me more questions from the topics which i am teaching. *				91%	9%
<b>FOR STUDENTS</b>					
Android mobile is available	20%	20%		60%	
For getting online link is very easy		30%		70%	
Pictures showing on the screen are clear		20%	10%	60%	
Connectivity is good		20%	15%		65%
Online teaching becomes very interesting and easy for getting knowledge		25%	10%	55%	10%
Face to face communication possible		70%	10%	20%	

Peaceful environment is available		40%	20%	40%	
Net pack is very costly		20%		80%	
It was very easy to understands practical subject		20	10	70	

( Source: Primary)

Chart showing the opinion of the teachers regarding online teaching and challenges

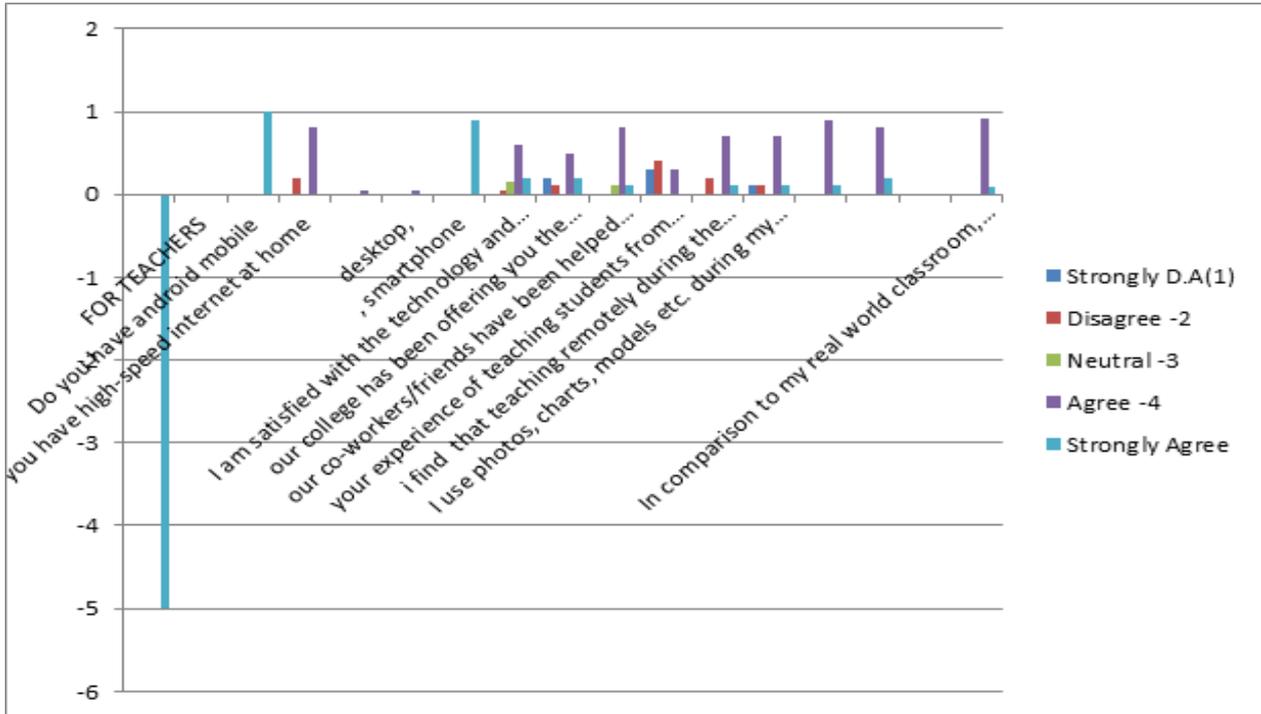
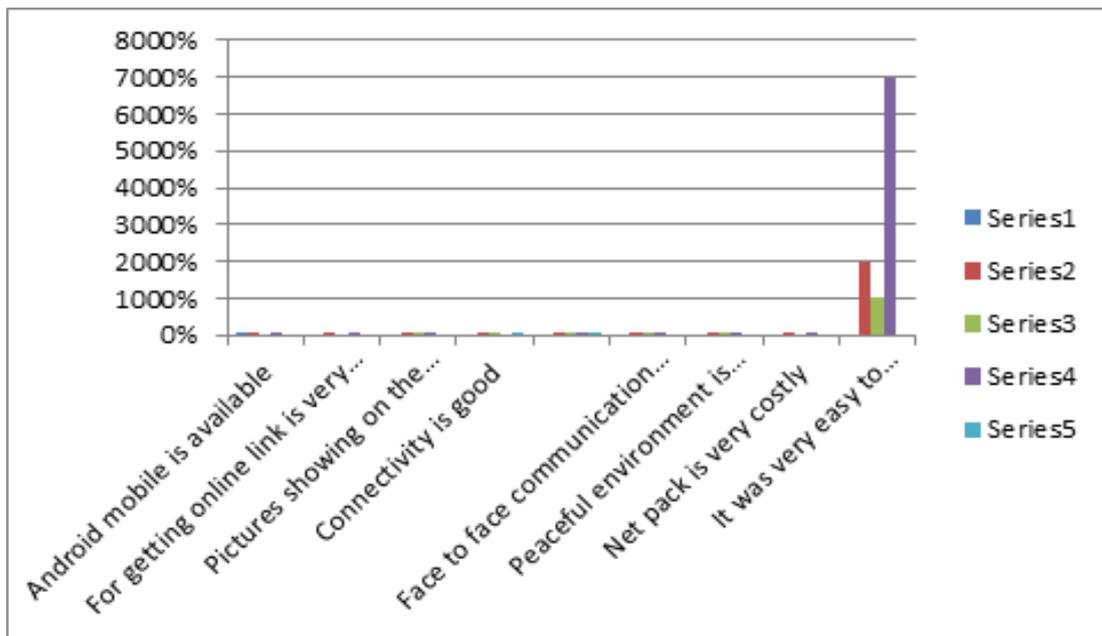


Chart showing the opinion of the students regarding online teaching and challenges



From the above table it is observed that

- 100% teachers and 60% students have a android mobile. Because the girls students said that the priority for using the mobile phone has given to their brother so they could not attend then lectures. Some girls said that early in the morning there was a work of washing cloths and other kitchen work allotted to them in the home.

2. Everyone doesn't have high-speed internet at home.
3. 90 % teachers are using the mobile phone for delivering the online lecture because it becomes very easy to send the link and for high speed of internet.
4. 60% teachers were satisfied with the technology and software using for online teaching by them.
5. 40% teachers are satisfied that experience of teaching students from home as compared to teaching at college was very good.
6. Having a positive and healthy relationship with co-workers is essential to succeed in a remote work set-up. Teachers might work in teams or need help from the supporting staff. Working from home offers flexibility, but it also requires the team members to plan their schedules to have an overlapping time frame. Check if teachers are getting enough support from other staff.
7. There can be a number of things to manage while working from home. Teachers might feel bothered due to increasing job insecurity and the rising cost of living. Since everyone is advised to stay at home, it can be challenging to manage work and kids. This question is very important to know how distance learning has affected the stress levels of teachers.
8. Teachers and professors cannot enjoy teaching online if students are not happy while learning. Know the state of mind of the students and what they are going through during the coronavirus pandemic. It is essential to get this insight to plan the future strategy on distance learning.
9. The COVID-19 pandemic changed the way we lived our lives. It was never required earlier to teach students from home. Responses to this question will reveal their relative experience as compared to teaching in-person at college
10. Juggling work at home can be stressful for many people. It requires one to have good time-management skills to maintain work-life balance and complete all tasks. It is not only important to achieve goals within time, but you must also feel satisfied with the outcomes.
11. This question collects insights on whether students like online education and stay focused during the classes. It implies whether how easy or difficult students find to learn a subject.
12. It is essential to have a disturbance-free environment while working at home. Noise or kids playing around can be irritating for both teachers and students. If teachers don't have a peaceful work environment at home, school authorities can support them to teach online from the schools, if possible.
13. Technology can be a game-changer when it comes to online education. It can make it easy or hard for students to learn a course. This question seeks teachers' opinions on the extent they consider technology to be important in distance learning.
14. Android mobile is available to 60% students, 70% students can easily get the link
15. 60% students are expressed that the Pictures showing on the screen are clear and 65 % students are agreed that Connectivity of mobile is good .
16. 55% students are agreed that Online teaching becomes very interesting and easy for getting knowledge and 20% students are satisfied with Face to face communication of online teaching, only 20% students are available the Peaceful environment
17. 70 % students are agreed that through the online teaching It was very easy to understand practical subject.

### **SUGGESTIONS**

1. With face-to-face communication, you can get the opportunity to connect with the students closely, solve their problems, and network with students from diverse backgrounds. You can use your body language and expressions to transmit more information while teaching. On the other hand, it is easier for teachers to know if students understand the subject from their voice and body language. Students can ask queries and get answers instantly. In the case, students might need emotional support from their parents to overcome these difficult times, apart from physical resources. With this question, you can check if children are getting enough support from the family.
2. Teachers might need to make extra efforts while teaching students online. Some kids may not like the online education model and find it challenging to learn. Some students may find it difficult to remain

focused as there can be many distractions at home. This question checks if the students are learning as much as they were before moving to distance learning.

3. Learning from home can be lonely. Without the buzz of the classroom setting and the company of their peers, it's no surprise that some students can begin to feel a strong sense of isolation that slowly erodes their desire to learn.
4. Despite what they say, many students will find that they *miss* college when the alternative is to be desk-bound at home. **Coordinate virtual group activities** using chats, discussion boards or cloud tools for collaboration. **Show your face and let students hear your voice**, using video or audio recordings. Don't let yourself become a robot who only communicates via text. **Schedule regular check-ins with students** via email or chat, if you have the capacity. Pay attention to those at risk of disengagement in particular. Read up on more **tips for communicating and staying connected remotely**.
5. **Clear, measurable goals are the best source of motivation**. Set them regularly so that students have something to focus on. Instead of setting an open-ended task and leaving them to it as can be the temptation when you aren't in the same room — clearly specify:
6. Teachers might consider gamified apps and programs as another way to increase motivation, particularly in the younger years. These are explicitly designed for student engagement in independent environments, so it removes a lot of the hassle.
7. *The major findings of the survey revealed that about most of the teachers are taking online classes for the first time. Lack of appropriate materials and resources, Technical problems, Lack of in service training, difficulty in assembling all the students for the class, Lack of cooperation from the parents, Lack of internet facilities to the students, difficulty to follow up the learning of students are the major challenges faced by them. Further, teachers have a highly positive and favourable attitude towards on line teaching but due to lack of efficacy and training in online mode of teaching they feel that they can teach better in traditional teaching.*

## CONCLUSIONS

In the midst of coronavirus pandemic, many higher education instructors were faced to pivot their instruction online to allow teaching and learning to continue. In online learning environment it is important to help students engaged with. With education worldwide being thrown into disarray by coronavirus more and more educators are being forced to teach their students from home.

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## SYNTHESIS AND ANTIBACTERIAL ACTIVITY OF SOME FORMAZANS VIA BIOACTIVE SCHIFF BASES

Dr. Shrikrishna D. Tupare

K. E. S. Anandibai Pradhan Science College, Nagothane Tal. Roha Raigad 402106 [MS]

## ABSTRACT

The chemistry of formazans derivatives was reviewed in largely due to wide variety of physiological activity of compounds. These compounds are belonging to azo dye family. They found to active against antiviral, antibacterial and antifertility. Various formazans derivatives occupy an important role in medicinal chemistry. Important and interesting roles of formazans are in Dyestuff Chemistry. In living systems, they show microbiological activities. Application of formazans is in testing sensitivity of anticancer drugs. Different formazans compounds were used for dying and printing. Various formazans have attracted considerable attention as they have wide range of bioactivity.

Keywords: Formazans, Azo dye, Medicinal Chemistry, Microbiological activities.

## INTRODUCTION

The chemistry of formazans derivatives was reviewed in largely due to wide variety of physiological activity of compounds. These compounds are belonging to azo dye family.<sup>1</sup> They found to active against antiviral<sup>2</sup> and antibacterial<sup>3</sup>, antiviral.<sup>4, 5, 6</sup> antimicrobial,<sup>7-8</sup> and antinflammatery.<sup>9</sup> Several formazans show promising anticonvulsant and therapeutic agents.<sup>10-11</sup> Many formazans derivatives occupy an important role in medicinal chemistry. They also found to possess anti-fertility activity<sup>12</sup>.

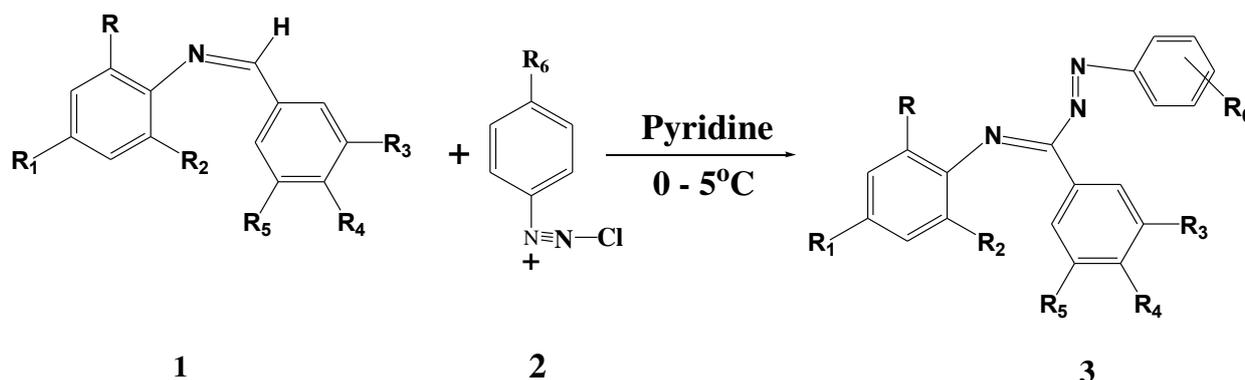
The chemistry of formazans derivatives was reviewed in depth largely due to wide variety of physiological activity demonstrated by this class of compounds. An interesting feature of formazans is that, they were prepared from Schiff Bases which are known for their various biological activities and benzene diazonium Chloride in laboratory. Schiff bases are utilized as starting material in the synthesis pharmaceutically important compounds such as formazans derivatives which have already attracted considerable attention in the analytical chemistry because of their high sensitivity toward many metals and organ metals. Marjadi *et al.*<sup>13</sup> & Ahmed M. Jasmin<sup>14</sup> were synthesized a series of formazans by condensation of Schiff bases and diazonium salt of various substituted aromatic amines. Shivaji Chavan *et al.*<sup>15</sup> were synthesized formazans and evaluated for antimicrobial activity and these found potent active. Several 1,3,5-triarylformazans were synthesized using a new methodology. Azo-coupling of aryl diazonium salts with aryl-aldehyde aryl hydrazones under mild basic conditions in two-phase liquid-liquid media is efficiently promoted by phase-transfer catalysts.

## PRESENT WORK AND METHOD:

In present study we have synthesized five different substituted formazans by coupling Schiff Bases<sup>16</sup> with appropriate aryl diazonium chloride derivatives.

Different Aromatic bases in acetic acid and hydrochloric acid were diazotized at 0-5<sup>0</sup> C and resultant solution was added to the solution of Schiff bases in pyridine with continuous stirring within 15 minutes. The reaction mixture was allowed to left overnight at room temp. A dark coloured solid separates out was filtered and recrystallized from ethyl alcohol. The purity was checked by TLC.

## Scheme: I



Where R<sub>6</sub>= -H, -CH<sub>3</sub>, NO<sub>2</sub> etc.

**Experimental Section:-****Preparation of (1Z)-N-(p-tolyl imino)-N-(4-chlorophenyl)-2-hydroxyl benzamidine :**

P- toluidine(0.02) in glacial Acetic Acid (2ml) and Conc. HCl (0.5ml) was diazotized at 0-5<sup>0</sup>C and resultant solution was added drop wise to the solution of 2-((E)-(4-chlorophenylimino)methyl)phenol (0.01) in pyridine with stirring. The reaction mixture was allowed to left overnight at room temp. A dark coloured solid separated which was filtered, washed with water and crystallized from ethyl alcohol. Purity of synthesized formazans was checked by TLC and structures were assigned on the basis of spectral data.

**Spectral Discussion:-** IR spectra of compounds were Scanned Bruker Spectrometer <sup>1</sup>H NR spectra were recorder in CDCl<sub>3</sub> on AVANCE-300 MHz instrument using TMS as an internal standard.

**Formazan Compound (1Z, 16Z )-N-(P-tolyl imino )-N-(4-Chloro phenyl) – 2–hydroxy benzamidine:**

**IR spectra:** Formazans showed characteristic band in the region **1568-1613.65** cm<sup>-1</sup> due to N=N stretching vibration and band around **1456-1484.56** cm<sup>-1</sup> due to aromatic stretching. C–Cl stretching observed at **757** cm<sup>-1</sup> vibration Band at **3443.84** cm<sup>-1</sup> due to –OH group.

**<sup>1</sup>H NMR:** <sup>1</sup>H NMR spectra of Formazans showed singlet peak in the region  $\delta$  **8-9** due to azomethine protons. A singlet of azomethine was observed at near  $\delta$  **8.3-9.2** and phenolic hydroxyl group as a singlet at near  $\delta$  12.2-13.,  $\delta$  2.5 is due to –CH<sub>3</sub>,  $\delta$  7.1-7.3 ,  $\delta$  7.95 and  $\delta$  6.70-6.90 were due to Aromatic Protons.

**ANTIBACTERIAL ACTIVITY:**

All synthesized compounds were screened for their antibacterial activities against E. Coli and S. a. by cup-plate method.<sup>17</sup> Standard antibacterial drug penicillin was also tested under similar conditions for comparison. Zone of inhibition in mm of synthesized compounds and standard drug are shown in Table 2.

**RESULTS AND DISCUSSION**

Initially we have used convenient method for the synthesis of Schiff bases at room temperature. The use of grinding method afforded the corresponding Schiff base in 80-85% yield (**Table 1**). By using this Schiff bases we have synthesized different formazans. The methods used in synthesis are quite fair and the reaction times are very short.

**Table:1 Physical data of Formazans Compounds:**

Entry	R	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	M.P. <sup>0</sup> C	Yield <sup>a</sup>
3a	OH	H	Cl	Cl	125-127	60
3b	OH	H	CH <sub>3</sub>	CH <sub>3</sub>	138-140	71
3c	OH	H	H	Cl	115-117	65
3d	H	F	CH <sub>3</sub>	CH <sub>3</sub>	142-144	54
3e	H	F	Cl	Cl	152-154	58

a = Isolated yield after purification.

**Table 2. Antibacterial activity of compounds (3a-e)**

Sr. No.	Formazans	Antibacterial Pathogens	
		E. Coli(ATCC 8739)	S. a. (ATCC6538)
1	3a	11.5mm	-ve
2	3b	7mm	8mm
3	3c	11mm	8.5mm
4	3d	8mm	-ve
5	3e	10mm	6mm
6	Penicillin	12mm	9.5mm

Legends –ve indicates No activity

**CONCLUSION**

Most of the synthesized compounds have shown antibacterial activity to some extent. Compound 3a was found active against pathogen E. coli where as compound 3c was found active more than standard value of antibacterial specimen. Percentage yield of all synthesized compounds was found good with used Schiff bases. It is environmentally suitable method of synthesis because at room temperature product would be obtained.

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**SOCIO-PSYCHOLOGICAL IMPACT OF ONLINE TEACHING ON STUDENTS**

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**Mr. Suryawanshi H.K<sup>1</sup> and Ms. Anuradha Chillar<sup>2</sup>**<sup>1</sup>Assistant Professor, Vpmk's Arts, Commerce and Science College, Kinhavali

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**ABSTRACT**

*The Indian government put a lockdown to minimize meetings and physical contacts to reduce the spread of the covid-19 virus. Indian government implemented emergency protocols to control the spread of the covid-19 virus which resulted in restrictions. These conditions have implications for the effectiveness of the learning process in education. Online teaching has become a mandatory step to be taken by teachers for the welfare of students all over the world. However, this move has totally disrupted the student's social life, timetable, and everyday routine, making the student less social. The objective of this study was to identify the socio-psychological influence of the online teaching-learning process on students. Online teaching on laptops, tablets, or some other system is only possible for students living in urban areas, but there is a huge network challenge in rural areas hence the students are deprived of engaging in lectures.*

*The technique of analysis used here is quantitative form. In which about 70 students from various Indian universities received their feedback through Google form. The study finding indicates that (1) students preferred to learn online or offline, (2) students facing some health issue in the learning process of online teaching, (3) network challenges in rural areas, (4) students facing socio-psychological problems, (5) students able to grasp online concepts in various topics. We will also explore how the student's mind gets tricked during online teaching and the social and psychological effects on their life. We have also evaluated the number of students surveying their multiple problems in this paper and it will be well illustrated graphically.*

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**1. INTRODUCTION**

Education plays important role in overall growth of human being which leads to the growth of nation/community. Education leads to the growth and prosperity in different sectors of country. Emergence of covid-19 virus emergency protocols were implemented in India to control spread of corona virus resulted in restrictions on public movements (Saha et al. 2020)<sup>1</sup>. All educational institutions will closed from last few months then need for rapid transition from physical learning to the online learning (Kapasias et al. 2020)<sup>2</sup>. Online learning has been observed as a possible alternative to conventional learning (Adnan and Anwar 2020)<sup>3</sup>. In these paper we will major focused on students from less privileged background have experienced larger impact due to covid-19 (Aucejo et al. 2020)<sup>4</sup>. Teaching is bilateral process in that role of both students and teacher are very important but in online mode it is only one way communication students are not communicate this is one of the reason they not understand concept they become aggressive leading to a serious socio-psychological impact on their health (Lee 2020)<sup>5</sup>. In online mode of learning students become less social and their daily routine completely changed.

In this paper we have also evaluated the number of students surveying their multiple problems in this paper and it will be well illustrated graphically.

**2. OBJECTIVE AND METHODS**

A set of Questionnaire was developed, which included variety of multiple-choice questions, short answers and respondent were allowed to enter texts. The survey administered with the help of Google forms platforms, which requires email account and mobile number to participate in survey. All instructions given to students in Google form clearly, to give correct information of their opinion.

Objective of this study to identify the problems of students in different manner also how much effective online teaching. Once you study its advantages and disadvantages of online learning process then we think about that and modify. Obviously online teaching learning process is necessary but we have to take into consideration of rural areas students also in India maximum number of students from rural areas there is network problem, financial problem above that when we are using long time mobile then its side effect on health, social, psychological we identified through this survey.

**2.1.0 SOCIAL IMPACT OF ONLINE TEACHINGS**

We will start our discussion with the concept of social structure followed by discussion of two important elements i.e., status and role.

### **2.1.1 DISTURBANCE IN STATUS**

Students relationship with a teacher is defined by a status that teacher enjoys in society. In societies where teachers are expected to shown respect, it is quite common for students to stand up in respect when a teacher enter a class. In some societies this may not happen and a teacher is even addressed by its first name but not in India. During online classes students wish good morning to their teachers. But the way of showing respect is changed or disturbed. The way of showing respect on online mode seems to be formal rather than from heart while during offline both mind and body act while showing respect. When a student and teachers discuss online sometime it is not able to be known who is student and who is teacher.

### **2.1.2 EXPECTED ROLE OF STUDENTS AND TEACHERS**

Teaching is a bilateral communication process in that role of students and teachers are equal but in online mode students are not communicate with teachers it is only one way communication. In online mode students are not behaving properly they are not following rules in society also not giving respect to elder one their impact in future is dangerous.

### **2.2 ROLE ORIENTATIONS**

Variation within status is called role orientation. The student role has broad outline and expectation each student may emphasis different aspect of role .One may concentrate on the experience of taking online classes while other are able to concentrate on offline classes.

### **2.3 DEPLETION OF MOARL VALUES**

When a student go to school he learn a lot of things like how to behave with your friends. How to be in a proper discipline. How to control their behaviour in different situations. How to act when a teacher explain a particular topic.

### **2.4 ONLINE CLASS STARTED TO DEFINE STATUS OF PERSON DURING EPEDEMIC COVID-19**

During period of covid-19 online teaching define position within social system called status. Later on having good android phone of 10000 with student define status of a person. More expensive phone student have greater the status he hold in society. Due to this reason only even small student start asking their parents to give expensive phone. In India wealth is distributed unequally than an income. A large share of wealth is inherited rather than earned. Every parents want that their child to study. But all family cannot afford it. So in order for their better study some parents even stared buying as much as expensive phone as possible. Every expensive phone has new features which attract students towards the thing which make them repulsive from their studies.

- In covid-19 only those family can afford expensive phone those who are under **ascribed status** means the family who has got a lot of wealth from birth or inherited from their parents or grand parents.
- People who come under **Achieved status** means who move his family on the basis of his daily earning cannot afford even cheapest phone for their children.

### **2.5 DISTURBANCE FACED BY STUDENT IN RURAL AREAS**

Students living in different region will play different role towards online studies. Students who are living in **rural areas** faces a lot of problem like network issues, light problem due to which class are disconnected. They don't have proper room to take online classes. They do not have headphones. There is unavailability of towers in the village due to this there is always network problem.

### **2.6.0 PSYCHOLOGICAL IMPACT ON CHILDREN**

#### **2.6.1 AGGRESSIVE BEHAVIOUR**

To reduce covid-19 in India government has put lock down. Because of this many people are unable to do the work which was only the source of income. So children of such families are unable to pay fee. A lot of children had not taken admission this year because of shortage of money in their families. They don't have this much money so that they can afford to buy new android phone and every month recharge. Students feel angry on such situation. They emotionally do not feel well when their one year is wasted while their friends who are rich are able to take admissions. In this way aggressive behaviour is observed in students.

#### **2.6.2 INCREASE OF ANXIETY AND FEAR**

Students who have to give exams of board they are first only under psychological pressure and further when they are unable to understand online study feel more pressure. Technical topics Such as mathematics part like integration and differentiation are really difficult to understand for class 12<sup>th</sup> and UG students in India where they are just learning the starting of topic. Due to long time using mobile phone radiations comes from screen due to which students are unable to sleep properly at night. In the morning their mind is not ready to learn new things. Student got anxious and fearful. When students got anxious they are unable to study properly.

**2.6.3 TRAP IN A VIRTUAL WORLD**

Parents who had given their children phone for studying but student by making excuse of online classes start playing games like pub-g, free fire and also they using different social media for chatting purpose. Once they start playing these games then they got habitual of it. They just enter the virtual world of phone and forgot the reality of world and their work.

**2.6.4 DISTURBANCE IN HARMONES**

On internet good and bad both websites were available. BUT the mind of student who are in small classes or teen age students are unable to differentiate between them. They may accidently open the website which may contain the material which is Inappropriate for their ages. Once they enter in such types of things their brain get tricked in such way that they are unable to leave these sites. Instead of having healthy dream at night about their life they would dream unhealthy and spend rest of day unhealthy. If students are studying on mobile and while studying if they get the message from social media then they leave their studies and make themselves busy in chatting with their friends on facebook, whtasapp etc. and forgot about their studies.

**2.6.5 OTHER HEALTH PROBLEMS**

A lot of students are facing problems like headache, pain in eyes due to harmful radiations also effects on the children’s health.

**2.6.6 FINISHING OF HONESTY**

Giving online exam has become fun for students. Student give exam by opening notebook in front of them and making group of many students only one students are studying and other copying from them as a result they not loose their honesty.

**3.0 RESULT AND DISCUSSION:**

In this study, our findings indicated that the impact of online teaching on students mental health, socio-psychological, daily routine of the students. In this study our finding indicates that fig.1 in this survey we taken students from different Indian universities result shows that near about 64% students preferred offline mode and 36% students preferred online mode of teaching. Fig.2 In India maximum number of students from rural as a result we found that 70% students have Internet problem and 30% students no internet problem it indicate maximum no of students are not able to attend lecture. Fig.3 Indicated No. of students facing social psychological problem we found that near about 40% strongly facing problem, 25% student have no problem, 35% students facing little bit problem. All this problem arises due to loneliness of students in online teaching also using long time mobile it emits different radiations. Fig. 4 It indicates health issues of students we found that 36% students facing headache problem, 43% students facing pain in eyes and 21% students facing other problems. In online teaching mode maximum number of students suffering from different health problem. Fig.5 Indicate that problem in understanding different concept of subjects result indicate about 70% students not able to understand online lecture, 20% of students have no problem they understand, 10% students confused. In this paper we taken feedback from students and analyzed finally it indicates many disadvantages and strong bad impact on student’s health, socio-psychologically.

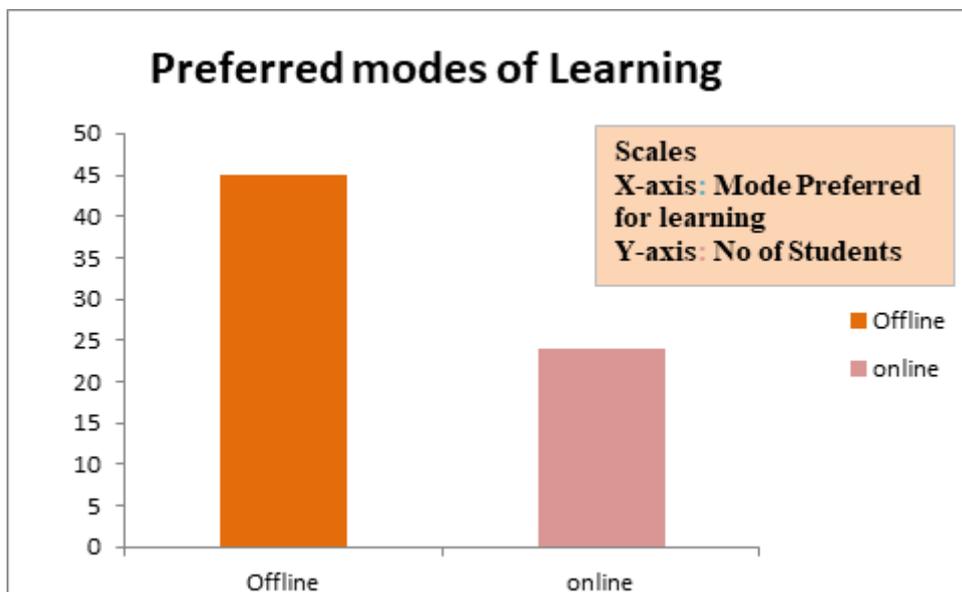


Figure 1 Preferred modes of learning

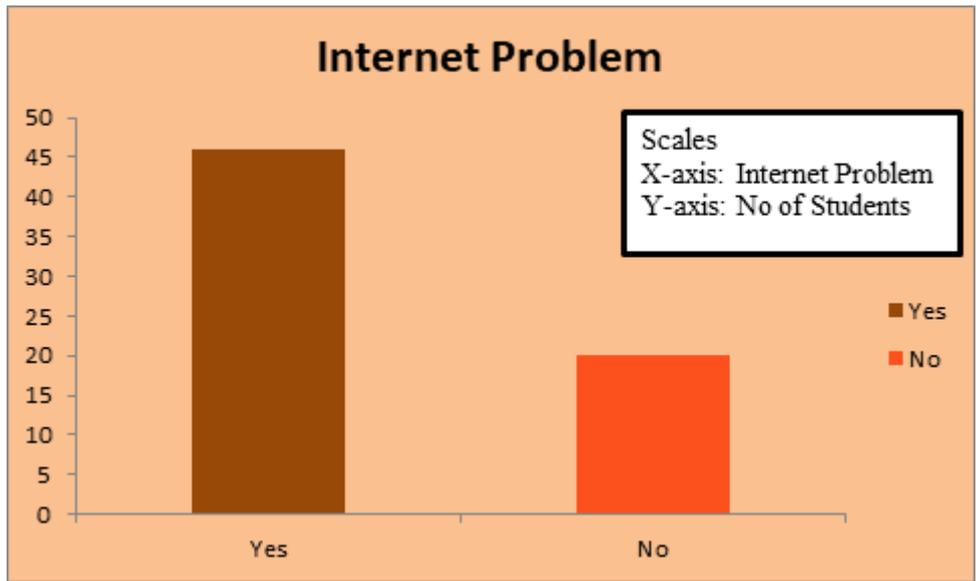


Figure 2 Internet Problem

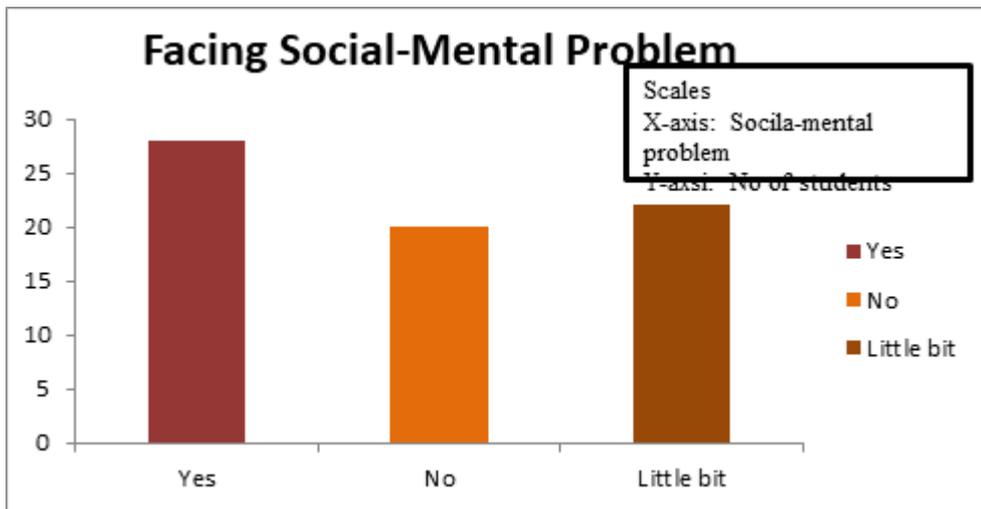


Figure 3 Facing Social-mental problem

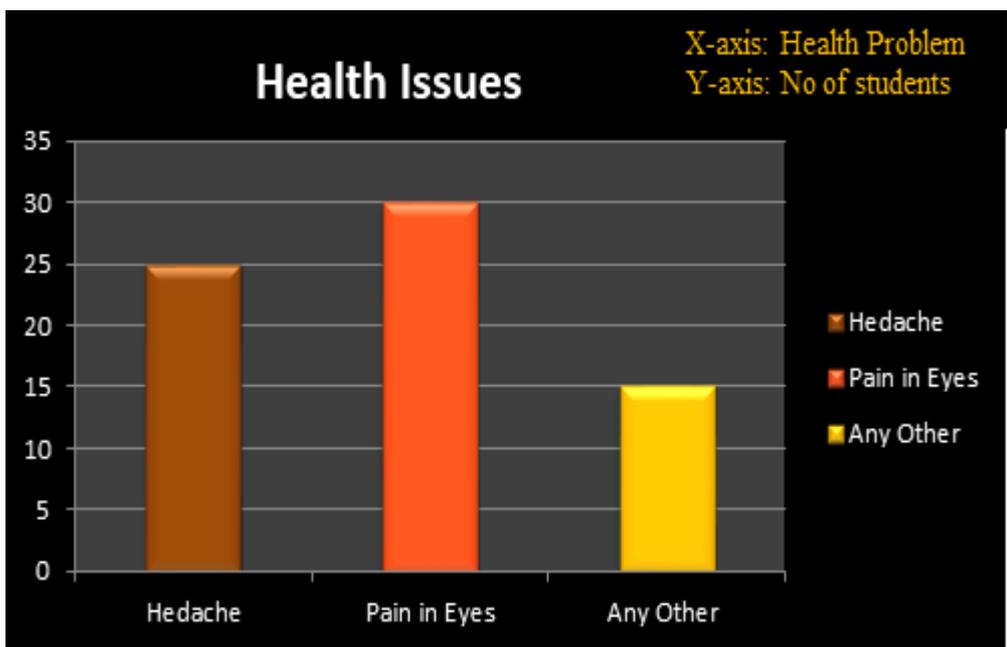


Figure 4 Health Issues

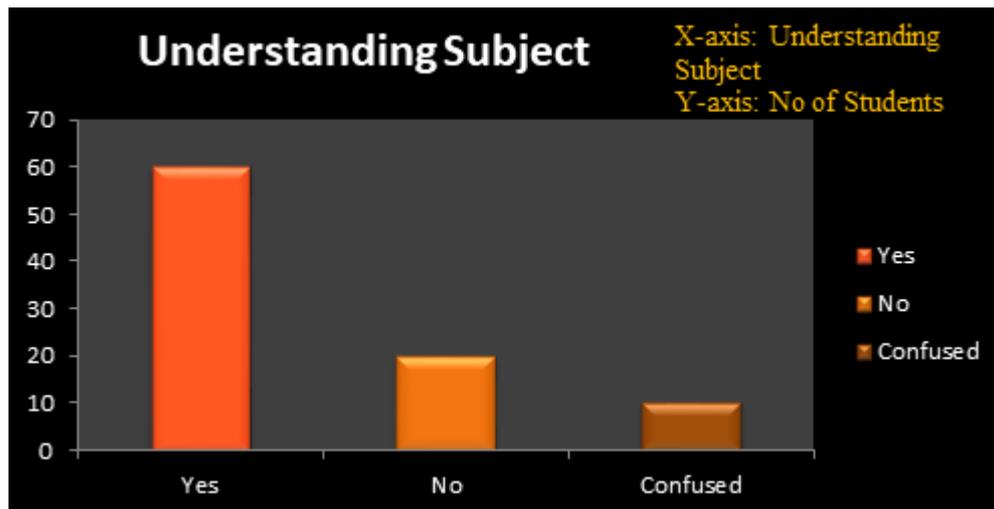


Figure 5 Understanding of Subjects

### CONCLUSION

In this study our finding indicates that Online teaching is necessary but also need to take care of students in different angles. Due to COVID-19 our education system is totally changed as a result student will disrupted socially as well as mentally.

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## EVALUATION OF PHENOLIC CONTENT ALONG WITH ANTIOXIDANT POTENTIAL OF COMMIPHORA MUKUL

\*Shweta Hingwasiya and \*\*Shailbala Baghel

\*Assistant Professor, Govt. P.G. College Narsingharh

\*\*Professor, Sarojini Naidu Govt. P.G. Girls College Bhopal

**ABSTRACT**

Plants have been used since ancient times as an important source of biologically active substances. The aim of the present study was to investigate the phytochemical constituents (Phenolics) and the anti oxidant activity of the Commiphora Mukul. Phenol content was analyzed by spectro photometer at 765 nm respectively. The free radical scavenging activity was evaluated by DPPH method. This Study provides a definitive report about the free radical scavenging activity of Commiphora mukul.

*Keywords: Antioxidants, Commiphora mukul, Free radical Scavenging Activity*

**INTRODUCTION**

Various herbs and components of foods or other ingestible substances that have potentially beneficial effects on human health and function are used as nutraceuticals. It include plant derived factors and factors derived from animal services..Commiphora Mukul (Burseraceae) a highly valued botanical medicines has been used to treat several ailments. Antioxidant components are micro constituents that inhibit lipid oxidation by inhibiting the initiation or propogation of oxidizing chain reactions and are also involved in scavenging of free radicals. Clinical approaches of anti oxidants increased multifold during the recent time for the management and therapeutic implication of neurodegenerative disorders, aging and chronic degenerative diseases. In view of the above, we designed the study to evaluate the antioxidant potential and phenolic content in Commiphora Mukul.

**MATERIALS AND METHODS****Chemicals :**

All the chemicals and reagents used in experiment were produced from sigma chemicals Co.st.Louis, USA,E,Merck (India),SISCO Laboratories and SRL .

**Preparation of alcoholic extract of in Commiphora Mukul by Reflux condenser :**

Take 50gm.of sample in flask of vortex condenser and add 150ml. of methanol. Adjust the temperature of heating methanol at 40<sup>o</sup>c and left it for 2 days. Decent the supernatant in a beaker and discard the waste of plant sample. Evaporate the methanol by keeping beaker in water bath at 40 to 60 <sup>o</sup>c. After complete evaporation dissolves the powder in 100 ml distilled water. Left this solution for complete dissolution. Centrifuge the solution for 15 minutes. Discard the pellet by taking supernatant. Determine the concentration of extract in solution.

**INVITRO EXPERIMENTS****1. Estimation of total phenol :**

The total phenol was estimated in alcoholic extracts of Commiphora Mukul using Folin-Ciocalteu method according to the procedure reported by Singeleton et.al.1999 using standard Gallic acid equivalents.300 microlitre of plant extracts were thoroughly mixed with 1,5ml of freshly diluted Folin-Ciocalteu reagent (1N) to which 1.2 ml of sodium carbonate solution (7.5%) was added and mixture was incubated for 30 minutes in the dark. The absorbance was measured at 750 nm using Spectrophotometer.

**2. DPPH free radical scavenging activity :**

DPPH free radical scavenging activity was estimated by measuring the decrease in the absorbance of methanolic solution of DPPH (2,2-diphenyl 1-picryl hydrazyl). 5 ml DPPH solution (0.2 mg of DPPH in 100 ml methanol).1 ml of plant extract was incubated for 30 min in the dark and absorbance was read at 517 nm. The absorbance of a reaction control was also recorded at the same wavelength. Ascorbic acid was used as standard. Scavenging ability (%) was calculated by using formula=

$$(A_0 - A_t / A_0) * 100$$

Where A<sub>0</sub>=Absorbance of reaction Control

A<sub>t</sub> =Absorbance of extracts

**RESULT AND DISCUSSION**

DPPH free radical Scavenging activity is one of the best, accurate and frequently employed method for evaluating antioxidant activity .The result showed greater rate of DPPH of ethanolic extract due to presence of high content of phenolic compounds. The percentage of free radical scavenging activity is shown in Table 1. The percentage of free radical scavenging activities were found that ascorbic acid exhibited higher DPPH free radical Scavenging activity than the compound at all concentrations. But ,at concentration 700 µg/ml scavenging activities of Commiphora Mukul were found to be very close to the ascorbic acid. This shows that antioxidant activity by DPPH free radical Scavenging which indicates that the resin can be used as source of natural antioxidant reagent

Total phenol content was measured by the Folin-Ciocalteu method and the results are presented in Table 2. Folin ciocalteu method is recognized as nonspecific for phenolic compounds. Other interfering substances such as sugar and ascorbic acid would also contribute to this specific antioxidant indices.

From the present study it may be concluded that alcoholic extract of Commiphora Mukul showed protective as well as therapeutic efficiency to cope up the oxidative stress.

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**TABLE-1 ANTIOXIDANT ACTIVITY OF ALCHOLIC EXTRACT OF COMMIPHORA MUKUL BY DPPH METHOD**

S,No.	CONCENTRATION (µG/ML)	SAMPLE	ASCORBIC ACID
1	100	16.84	42.08
2	200	26.45	58.75
3	300	39.32	69.68
4	400	52.37	74.45
5	500	76.95	82.56
6	600	80.17	94.63
7	700	94.32	98.12

**TABLE – 2 TOTAL PHENOLIC CONTENT OF COMMIPHORA MUKUL**

N1	N2	N3	N4	N5	Mean	Σ d2	S.D.
0.586	0.587	0.593	0.583	0.586	0.586	0.40	0.08

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**ISOLATION OF THE HYDROCARBON DEGRADING AND BIOSURFACTANT PRODUCING BACTERIAL ISOLATES FROM OIL CONTAMINATED SITES**

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**Harshada Pagare, Neha Kumari, Ritika.R.Choudhary, Bhagyashree Shinde, Jaishree M. Rathi, Tayyaba Shaikh, Aysha Khan, Yogesh Singh and Annika Durve Gupta\***

Department of Biotechnology, B. K. Birla College (Autonomous), Kalyan, Dist Thane, MS

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**ABSTRACT**

*Hydrocarbons are organic chemical compound composed exclusively of hydrogen and carbon atom. These hydrocarbons form the basis of crude oil, natural gas, coal, and other important energy sources. The hydrocarbon spill or oil spills is the release of liquid petroleum hydrocarbon especially in the marine ecosystem, due to human activity which results in pollution. The longer these pollutants are in water, the long-term damage is cause to the environment. There are many methods by which these spills can be removed, methods such as using skimmer, sorbents, in situ burning etc. But again, these methods are expensive and harm environment in different ways. Bioremediation is the promising technology for the treatment of these contaminated sites since it is cost-effective and will lead to complete mineralization. In this work, we have isolated and characterized hydrocarbon degrading bacteria from soil. The isolated was identified as pseudomonas spp. Bio surfactant production of these strains was performed. The crude oil and vegetable oil degradation efficiency of the isolated strains was studied. The degradation efficiency of strains was found to be 76.3 %<sup>[1]</sup>.*

**Keywords:** *Hydrocarbon, oil spills, pollution, haemolytic activity, bio surfactants.*

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**1. INTRODUCTION**

Various oil spills have taken place so far in this beautiful world of ours. Each one is as disastrous as the other. The Deepwater Horizon oil spill is considered to be the largest oil spill in the petroleum industry's history. In April 2010, the accident began after a spill from a seafloor oil gusher, leading to the explosion of BP's oil rig, Deepwater Horizon, in its Macondo Prospect. An estimated 53,000 barrels were flowing into the Gulf of Mexico every day. In fact, we have seen that an accident is not even necessary as the Gulf war in 1991 caused more oil pollution than the largest oil spill. As the Iraqi forces withdrew from Kuwait, they opened the pipelines and the valves of oil wells and set fires to block the forces of the United States from landing in the area. As a result, around 240 million gallons of oil are believed to have been discharged into the Persian Gulf, killing hundreds of fishes and marine mammals.

Oil spills and leaks during extraction and transportation put freshwater and ocean ecosystems in danger. The result is the pollution of the groundwater and other freshwater resources. Various forests have been deforested and mountains have been blasted for the extraction of fossil fuels through mining. This has led to extinction of critical wildlife habitat existing in that area and the pollution by the toxic waste generated in the process. Emissions released by burning of fossil fuels increased global warming resulting in climate change and more air pollution<sup>[2]</sup>.

Chemical dispersants are one of the ways to treat oil spills. They are the chemicals which are sprayed in the oil spill area with the help of aircrafts and boats. Chemical dispersants like corexit 9500 break down the oil slick into droplets and increase their surface area which aids the natural breakdown of oil components. To take quick action on the oil spillage, gelling agents like elastol are used to solidify the oil into rubbery substances. Further, the solidified product is easily retrieved with the use of nets. Though chemical agents help in cleaning spills, they pose a threat to the ecosystem as they are toxic in nature. They can destroy the beneficial microflora of the system with their toxicity<sup>[3]</sup>.

To treat the oil spill organically and without adding toxic waste in the ecosystem, various researches are being carried out to find the best green method possible. Bioremediation is one of those methods. Bioremediation converts the toxic compounds into their non toxic forms without disrupting the local environment with the help of microorganisms (bacteria)<sup>[4]</sup>.

In bioremediation, hydrophobicity of the petroleum hydrocarbon inhibits contaminants uptake by microorganisms. Thus, it becomes the limiting factor for the efficiency of the process. To improve the availability of these hydrophobic substrates, microbes produce and excrete biosurfactants. Biosurfactants are the amphipathic compounds which pseudo-stabilize the hydrocarbons. Biosurfactants are less toxic, biodegradable and possess the ability to reduce interfacial tension between oil and water phases. They have been found to be produced mainly by aerobically growing microorganisms in aqueous media from a carbon source feedstock, e.g,

carbohydrates, hydrocarbon, oils and other lipids or mixture thereof. Five major classes of biosurfactants are known, namely, glycolipids, phospholipids, lipoproteins or lipopeptides, polymeric and particulate surfactants. Three roles of biosurfactants in bioremediation are (i) increasing the surface area of hydrophobic water-insoluble growth substrates; (ii) increasing the bioavailability of hydrophobic substrates by increasing their apparent solubility or desorbing them from surfaces; (iii) regulating the attachment and detachment of microorganisms to and from surfaces. Therefore, it is of great importance to isolate and identify naturally occurring bacteria with a capacity to produce biosurfactants<sup>[5]</sup>.

Microbial remediation is advantageous as it is a natural process. It is cheaper than various other remediation technologies. It shows the possibility of complete destruction of the target organic pollutants without increasing the toxicity in the environment. For carrying out microbial remediation, screening a large number of strains and detection of metabolites is very easy, reliable and reproducible. It is now possible to manipulate microbes' genomes by using biotechnological methods. Thus, we can increase their capability to bioremediate various organic pollutants present in our ecosystem of varying toxicity and varying chemical composition<sup>[6]</sup>.

## 2. MATERIALS AND METHODS

### Collection Of Samples:

Different samples were collected from different areas such as water sample A (water from kalyan creek), soil sample B (cow dung), soil sample C (water from potholes), soil sample D (soil from RTO kalyan), water sample E, G (water from gutter, badlapur), soil sample F (soil from road side), & soil sample H (cow dung). The samples were collected and transferred to labelled sterile test tubes and were kept at room temperature.

The media was obtained from Himedia Labs. Pvt. Ltd. All the chemicals and media were prepared in distilled water

### Obtaining Pure Culture by Streaking Using Nutrient Agar:

In 100 ml of distilled water, 4.3 gm of nutrient agar media is added. The medium was dissolved completely by microwaving the medium. The Nutrient agar media about 5-6 ml was dispensed into 10 test tubes. Ten sterile test tubes containing NA were sterilized by autoclave at 15 lbs pressure, 121°C for 15-20 minutes. All the ten test tubes were kept in the Incubator at room temperature for 24 hrs. For screening of pure culture, selected colonies from each BH agar plate were streaked on the sterile NA test tube. Test tubes were incubated at 37°C for 24 hrs. For morphological identification of culture was carried out through Gram Staining. The sterile NA slants were kept at 4°C in the refrigerator to store pure culture for future use.

### Isolation of *Pseudomonas* Species Using Cetrimide Agar:

Cetrimide Agar is a selective medium used for the isolation of *Pseudomonas*. Few isolates showed the presence of a bluish green water soluble pigment when grown on a nutrient agar plate. So these isolates were streaked on cetrimide agar to confirm the presence of *Pseudomonas* sp. For making 50ml of cetrimide agar 0.30 cetrimide agar base, 1.55 gm of agar agar and 0.5 ml of glycerol was added in 50 ml of Distilled water and dissolved the mixture completely by microwaving. 50ml of cetrimide agar was made and poured in 3 sterile Petri plates with equal amounts. Culture samples of A<sub>P</sub>, H<sub>P</sub> and G<sub>D</sub> were taken from pure culture samples and streaked on cetrimide agar plates respectively. All 3 plates were incubated at 37°C for 24 hours. After 24 hours growth of blue - green colonies were observed on the cetrimide agar plate of the G<sub>D</sub> sample.

### Study of Haemolytic Properties:

In Distilled water, 1.3gm of Nutrient Broth powder was added for making Nutrient broth of 100 ml. pH of Nutrient Broth is adjusted at 7 ( $\pm 2$ ). 100 ml of Nutrient Broth were dispensed in 10 sterile test tubes by pipetting. Each test tube contains 10ml of nutrient broth. Loopful of all culture samples were taken from Nutrient agar slants and inoculated in Nutrient Broth test tubes. After inoculation test tubes were kept at 37°C for 24 hour for incubation.

### Biosurfactant Production Using Fermentation Broth by *Pseudomonas* Species:

All the components of fermentation broth were added in 100ml of distilled water. The medium was dissolved completely by microwaving the medium. The pH of the media was adjusted to 7 using 1N NaOH. The flask containing the fermentation broth was sterilized by autoclaving at 15 lbs pressure, 121°C for 15-20 minutes. Autoclaving flasks containing the fermentation broth were allowed to cool and added edible oil by 3% of the total volume. Inoculation of *pseudomonas* species from the cetrimide agar plate into the sterile fermentation broth. Incubated for 7 days at room temperature for the production of biosurfactant. And evaluate the crude oil degrading capacity of *pseudomonas* species by gravimetric analysis.

**Evaluation of The Oil-Degrading Capacity of *Pseudomonas* Species Using Gravimetric Analysis:**

The extraction of degraded oil was carried out by Gravimetric analysis. For estimation of oil degradation rate by gravimetric analysis, 10 ml of n - Hexane was added to the flask containing *pseudomonas* inoculated fermentation broth. The content was transferred to a separating funnel and extracted. Extraction was carried out twice to ensure the complete recovery of oil. The extract was treated with 0.8 gm of anhydrous sodium sulphate to remove the moisture and decanted into a beaker leaving behind sodium sulphate. This was evaporated to dryness at room temperature for 24 hours. The amount of residual oil was measured after the extraction of oil from the medium. The volume of extracted oil was deducted from the previously weighed beaker. The percentage of degradation was then calculated by following formulae.

Weight of residual crude oil = weight of beaker containing extracted crude oil - weight of empty beaker

Amount of crude oil degraded = weight of crude oil added in the media - weight of residual oil

% degradation = amount of crude oil degraded / amount of crude oil added in the media x 100

**3. RESULTS AND DISCUSSION:****Screening Test**

In this test, different soil samples, water samples, and cow dung samples were taken and the samples were screened against 100  $\mu$ L of petrol & diesel. Flasks containing the sample and Bushnell-Hass broth containing either petrol or diesel were then kept for 7-8 days for incubation.(Fig.1)

After the incubation period, the loopful of the sample was streaked on bushnell - haas agar petri plates containing either petrol and diesel (depending on the sample) as a carbon source. The plates showed the growth of colonies showing that the samples contained hydrocarbon degrading bacteria. The growth of isolates on the plates shows the ability of the isolates to degrade either Petrol and Diesel as Petrol and Diesel were the sole source of carbon. Thus, these bacteria clearly indicated that they have the ability to utilize hydrocarbons.(Fig.2)



**Fig 1: Samples inoculated in Bushnell -haas broth media**



**Fig 2: BH Plates showing growth of colonies**

**Isolating And Characterizing Hydrocarbon Degrading Bacteria :**

Nine strains were isolated that could grow on oil broth and agar media. The isolated bacteria were identified according to the criteria on the basis of colony morphology, pigmentation, Gram staining.

Based on (Gram nature, shape, size, colour, margin, opacity, elevation and consistency of colony) the morphological characteristics test results the preliminary identification of the isolated bacterial strain was done. Few isolates (**A<sub>P</sub>**, **G<sub>D</sub>**, **H<sub>P</sub>**) showed the presence of a bluish green water soluble pigment when grown on sterile nutrient agar plate/ slant. Therefore these isolates were streaked on sterile cetrimide agar to confirm the presence of *Pseudomonas spp.*



Fig 3: NA slants showing presence of *Pseudomonas spp.*

**Morphological Characteristics Of Isolates On Bushnell - Haas Agar Medium:**

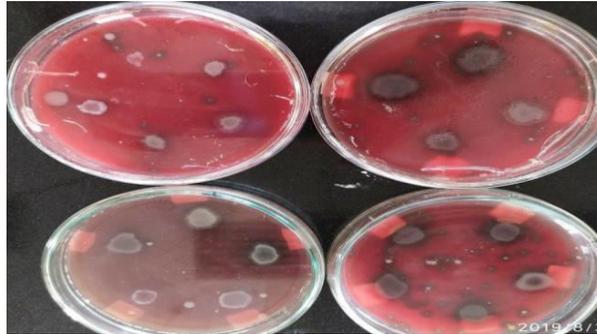
**Table 1 : Colony Characters of Isolates on Bushnell - Haas Agar Medium**

Isolate designation	A <sub>P</sub>	B <sub>D</sub>	C <sub>D</sub>	D <sub>D</sub>	E <sub>P</sub>	F <sub>P1</sub>	F <sub>P2</sub>	G <sub>D</sub>	H <sub>P</sub>
Size	1mm	2mm	1mm	1mm	1mm	1mm	1mm	1mm	2mm
Shape	Circular	circula r	circula r	circular	Oval	circula r	Circula r	circular	circular
Colour	Light yellow	Light yellow	Orange	Light yellow	Brow n	Off- white	White	Off- White	Brown
Margin	Entire	irregul ar	irregul ar	regular	Irregu lar	irregul ar	Entire	irregula r	Irregula r
Elevation	Flat	flat	flat	raised	Flat	raised	Raised	flat	Flat
Opacity	Transluc ent	translu cent	translu cent	transluc ent	transl ucent	translu cent	Opaqu e	translu cent	Translu cent
Consistency	Viscous	viscous	mucoid	viscous	Muco id	mucoi d	Brittle	viscous	Mucoid
Gram Nature	Gram Negative	Gram Positiv e	Gram Positiv e	Gram Positive	Gram Positi ve	Gram Positiv e	Gram Positiv e	Gram Negati ve	Gram Negativ e

**Hemolytic Activity Of Hydrocarbon Degrading Bacteria On Blood Agar By Spot Inoculation Method:**

All the isolated strains of HDB obtained from the sterile NA slants were inoculated in sterile NA broth for the spot inoculation on blood agar. The isolated strains of HDB show the Clear zones on the Blood agar indicating

the hemolytic activity. Beta-hemolysis was observed from the clearing of red colour from the agar around the bacteria formed a clear zone due to the breakdown of RBCs in agar. The isolates showing beta-hemolysis are A<sub>p</sub>, C<sub>D</sub>, H<sub>p</sub>, G<sub>D</sub>, & E<sub>p</sub>.



**Fig 4: Plate showing growth of colonies on blood agar plate**

#### Extraction of Oil:

The oil (petrol) degradation rate of *pseudomonas spp.* was found to be **76.3%**. Therefore the degradation of petrol in the fermentation broth shows the production of biosurfactant by the inoculated bacterial species (*pseudomonas spp.*).

In this study, the biosurfactant producing ability of the bacterial isolate such as *pseudomonas sp.* was screened and the result showed positive for hemolytic activity.

The % of degradation was calculated as follows:

Weight of residual crude oil = weight of beaker containing extracted crude oil - weight of empty beaker

Weight of residual crude oil = 68.73 - 68.09

= 0.64 g

Amount of crude oil degraded = weight of crude oil added in the media - weight of residual oil

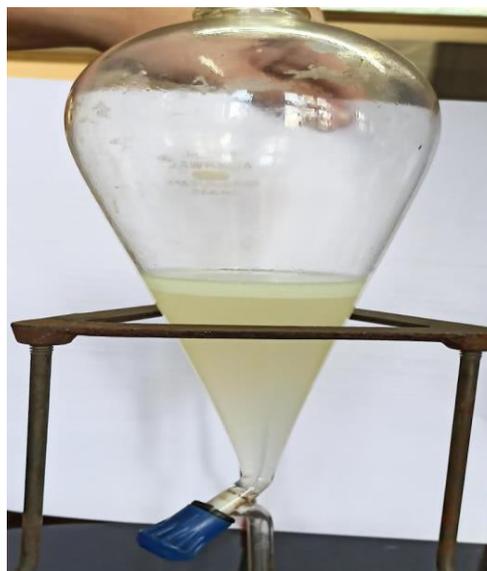
Amount of crude oil degraded = 2.7 - 0.64

= 2.06 g

% degradation = amount of crude oil degraded / amount of crude oil added in the media x 100

= 2.06 / 2.7 X 100

= **76.296 ~ 76.3 %**



**Fig 5: Gravimetric analysis**

There are many different strains and types of organisms such as bacteria and fungi are studied and isolated for various purposes. Some of these organisms have the ability to degrade the hydrocarbons. The metabolic

process and the extreme condition of the environment in which these microbes exist give them such a distinct ability that they can degrade hydrocarbons. Therefore they can function as bioremediation agents. These bacteria can be screened for their biodegradation abilities and optimized for bioremediation purposes. In this study, the organisms were isolated from different locations. The different soil and water samples were taken from different locations likely to have been exposed to petrol and diesel. In this study it was found that around 76.3% of petrol was degraded after the incubation time and the rate of degradation of petrol was found to be increasing continuously. In this study, the biodegradation ability of the isolated strain of *pseudomonas* sp. was observed.

In the present study, the hemolytic activity of the isolated strain was studied and it was found that the bacteria shows the hemolytic activity on blood agar. The hemolysis reaction on the blood agar showed the properties of the organism and the hemolysis was found to be beta - hemolysis. The hemolytic activity on the blood agar indicates the production of biosurfactants by the isolated strain of *pseudomonas* sp. Because of the production of biosurfactant the bacteria was able to break the RBCs on the blood agar plate forming a clear zone around the colony. The hemolysis activity on blood agar was shown by five isolates which were A<sub>P</sub>, C<sub>D</sub>, H<sub>P</sub>, G<sub>D</sub>, & E<sub>P</sub>

In the study to evaluate the amount of degraded petrol in a biosurfactant producing fermentation broth inoculated with the isolated bacteria gravimetric analysis was performed. The petrol degradation rate was found to be 76.3% showing the production of biosurfactants in the fermentation broth. The isolates showing degradation of petrol and biosurfactant properties were A<sub>P</sub>, G<sub>D</sub>, H<sub>P</sub>.

#### 4. CONCLUSION

The contamination of soil and water with petroleum compounds is among the most prevalent problems in environments worldwide. Petroleum compounds consist of hydrocarbons which occur extensively as pollutants in soil and water. These compounds also constitute potential risk to human health, as many of them are carcinogenic. In situ biodegradation is one of the primary mechanisms by which petroleum and other hydrocarbons are eliminated from the soil, water and marine environment. Hydrocarbon degrading bacteria are widely distributed in marine, fresh water, soil habitats and their use in bioremediation of hydrocarbon contaminated soil and water which exploits their ability to degrade and detoxify organic contaminants has been established as an efficient and environmentally sound treatment.

Our present study follows the isolation of these petrol degrading and biosurfactant producing bacteria from different soil, water and cow dung samples. Samples were collected from different sites which were likely exposed to petrol. These collected samples were brought to the laboratory and the isolation of these bacteria was carried out. Pure culture of these isolates were obtained on the sterile nutrient agar plate and slants. The hemolytic activity of these isolated strains was carried out to understand the hemolytic properties of the isolated strains and to check the ability of these bacteria to produce biosurfactants. The ability of biosurfactants production of these bacteria was also studied by the amount of oil degraded by these strains in biosurfactants producing fermentation broth inoculated with petrol. The petrol degrading and biosurfactants producing bacteria were found and the isolates belonged to *pseudomonas* spp. The morphological characteristics of these isolated strains were also studied.

The petrol degrading and biosurfactant producing bacteria was isolated from the areas which were already exposed to petrol. The isolates showed a more competent and active petrol degrading enzyme system than any other bacterial isolates which were not exposed to petrol. These isolates also degrade the petrol in biosurfactants producing fermentation broth showing their ability to produce biosurfactants. The activity of biosurfactant production is also observed by the hemolytic activity of the bacteria.

Use of biological processes such as bioremediation for the removal of petroleum waste from the environment found to be more economical and versatile. Bioremediation usually lowers the cost as compared to the chemical treatment processes for various contaminated sites. It is also less disturbing to the environment. However, because it is a natural process, it requires time. The above experiment shows that the bioremediation can be used effectively to treat petrol contaminated soil and water. The remarkable rate of petrol degradation and production of biosurfactants by bacterial isolates shown by this method allows for the safe and convenient use of this microorganism in the petrol contaminated area. And by using this method, which is much cheaper, less hazardous to the environment, easier and efficient, the isolated microorganism can be used in the contaminated soil and water and also in the industrial production of biosurfactants.

#### 5. ACKNOWLEDGMENTS

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## CYPERMETHRIN INDUCED TOXICITY IN NON-TARGETED ORGANISMS INCLUDING FISHES AND MAMMALS: A REVIEW ON PESTICIDE POLLUTION.

Nutan Kamble, Harsha Padwal and Vinod Narayane

Department of Zoology, B. K. Birla college of Arts Science and Commerce, Kalyan, Maharashtra, M.S. India

### ABSTRACT

Environment around us is constantly being abused due to the release of different types of pollutants and toxicants. All the types are potentially harmful as these pollutants eventually find their way back to human beings through the food chain (AusAID, 1996; Jacinto, 1997; Klumpp et al., 2002). It is necessary to concentrate on the pesticide pollution as it is known for polluting all the three entities of nature important to man which are water, soil and air. Pesticides use has increased many folds over the past few decades. According to an estimate, about 5.2 billion pounds of pesticides are used worldwide per year. The use of pesticides for pest mitigation has become a common practice all around the world. Their use is not only restricted to agricultural fields, but they are also employed at households in the form of sprays, poisons and powders for controlling cockroaches, mosquitoes, rats, fleas, ticks and harmful bugs. This review article mainly aims at correlating and discussing effects of pollution caused by pesticides such as pyrethroids popularly used in countries like India and various other across the globe.

### INTRODUCTION

Human settlements on the earth is increasing day by day in many folds which has led to increase in necessity of food and place to live in (AusAID, 1996). This has led to use of chemical Pesticide to ease the human life and to keep the insects and pest away from them. The chemical pesticide used all over the world are available in various combinations and concentration and with various brand names. Overuse of such chemicals eventually find their way to natural entities such as land, water and air and renders it polluted. Organisms including man who are in close and continuous contact with such chemicals are known to have some health ailments such as respiratory issues, impaired reproductive health, defect in vision and many more thus, it is necessary to study the effects of chemicals such pesticide on the environment, aquatic fauna and humans.

Pesticides have compelling effects on all the organisms if used indecorously. Non targeted organisms such as aquatic fauna including fishes are greatly affected as these pesticides find their way to reach the water bodies. Chemical substances such as pesticides alter the quality of water, upsetting the habitat of many aquatic organisms including fishes (Donohue et al., 2006). The change in water quality leads to heightened rate of mortality if pesticides are used in acute concentrations (Sarwar et al., 2007; Sabae et al., 2014).

### Observation Table and Discussion:

LC<sub>50</sub> values have been estimated in past for several commonly used pesticides on different fish models (Table 1).

Table 1: LC<sub>50</sub> values of some pesticides for different fish species.

S. No.	Name of the pesticides	Test organism	Duration of exposure	LC50 value	Reference
1	Acephate	Pimephales promelas (Fathead minnow)	96 hrs	>1000 mg/L	Johnson and Finley, 1980
2	Alaclor	Salmo gairdneri (Rainbow trout)	96 hrs	2.4 mg/L	Johnson and Finley, 1980
3	Akton	Channel catfish	96 hrs	400 µg/L	Johnson and Finley, 1980
4	BHC	Carassius auratus (gold fish)	96 hrs	348 µg/L	Johnson and Finley, 1980
5	Carbaryl	Salvelinus namaycush (Lake trout)	96 hrs	690 µg/L	Johnson and Finley, 1980
6	Carbofuran	Perca flavescens (Yellow perch)	96 hrs	147 µg/L	Johnson and Finley, 1980
7	DDT	Salmo gairdneri (Rainbow trout)	96 hrs	8.7 µg/L	Johnson and Finley, 1980

8	Endosulfan	Ictalarus punctatus	96 hrs	1.5 µg/L	Johnson and Finley, 1980
9	Diazinon	Channa punctatus	96 hrs	3.09 ppm	Rahman et al., 2002
10	Diazinon	Anabas testudineus	96 hrs	6.55 ppm	Rahman et al., 2002
11	Diazinon	Barbodes gonionotus	96 hrs	2.72 ppm	Rahman et al., 2002
12	Elsan	Channa punctatus	48 hrs	0.43 ppm	Rao et al, 1985
13	Permethrin	Cyprinus carpio (common carp)	24 hrs	35 µg/L	Sial et al., 2009
14	Biosal	Cyprinus carpio (common carp)	24 hrs	4.21 mg/L	Sial et al., 2009
15	Cypermethrin	Labeo rohita (Rohu)	96 hrs	4.0µ/L	Marigoudar et al., 2009
16	Dimethoate	Heteropneustes fossilis (Asian stinging cat fish)	96 hrs	2.98mg/L	Pandey et al., 2009
17	Methyl parathin	Catla catla	96 hrs	4.8ppm	Ilyazhanan et al., 2010
18	λCyhalothrin	Danio rerio (Zebra fish)	96 hrs	0.119µ/L	Ansari and Ahmad, 2010
19	Cypermethrin	Colisa fasciatus (Banded gourami)	96 hrs	0.02mg/L	Singh et al., 2010
20	Metasystox	Nemacheilus botia	96 hrs	7.018 ppm	Nikam et al., 2011
21	Malathion	Labeo rohita (Rohu)	96 hrs	15mg/L	Thenmozhi et al., 2011
22	Rogor	Puntius stigma (Pool barb)	96 hrs	7.1ppm	Bhandare et al., 2011
23	Endosulfan	Channa striatus	96 hrs	0.0035ppm	Ganeshwade et al., 2012
24	Malathion	Heteropneustes fossilis (Asian stinging cat fish)	96 hrs	0.98ppm	Deka and Mahanta, 2012
s25	Termifos	Clarias gariepinus	96 hrs	0.86 mg/L	Nwani et al., 2013
26	Endosulfan	Catla catla	96 hrs	0.98 µg/L	Ilyas and Javed, 2013
27	Endosulfan	Cirrhinus mrigala	96 hrs	1.06 µg/L	Ilyas and Javed, 2013
28	Endosulfan	Labeo rohita	96 hrs	2.15 µg/L	Ilyas and Javed, 2013
29	Dimethoate	Labeo rohita	96 hrs	24.55 µg/L	Dey and Saha, 2014
30	λ Cyhalothrin	Labeo rohita	96 hrs	0.7 µg/L	Dey and Saha, 2014
31	Karate	Cyprinus carpio	96 hrs	0.160 µg/L	Bibi et al., 2014
32	Cypermethrin	Carassius auratus	96hrs	0.025 µl/L	Study conducted in laboratory by authors.
33	Pyrethrum	Coho salmon,	96hrs	13-65 ppb	Jonson &

		Atlantic salmon, Brown trout, Lake trout, Channel catfish, bluegill			Finley, 1980
34	Monocrotophos	Tilapia, Mosquito fish	96hrs	11.5-20.5 ppm	Rao, 2006; Kavitha & Rao, 2007
35	Permethrin	Brook trout	96hrs	1.4-7.9 ppb	Jonson & Finley, 1980
36	Methyl Parathion	Freshwater characid fish, Coho salmon, Cutthroat trout, Rainbow trout, Brown trout, Lake trout, Goldfish, Carp, Fathead minnow, Channel catfish, Bluegill, Black bullhead, Green sunfish, Largemouth bass, Yellow perch	96hrs	0.25-9 ppm	Mayer & Ellersieck, 1986 ; Monteiro et al., 2006; Jonson & Finley, 1980
37	Malathion	Coho salmon, Cutthroat trout, Rainbow trout, Brown trout, Lake trout, Goldfish, Carp, Fathead minnow, Black bullhead,	96hrs	4-12900 ppb	Mayer & Ellersieck, 1986 ; Jonson & Finley, 1980

		Bluegill, Green sunfish, Largemouth bass, Yellow perch, Redear sunfish			
38	Methamidophos	Rainbow trout, Fathead minnow, Channel catfish, Bluegill	96hrs	1.6-100 ppm	Jonson & Finley, 1980
39	Fenvalerate	Zebra fish	96hrs	3.5-193 ppb	Ma et al., 2009
40	Isoprocarb	Goldfish	96hrs	4.61 ppm	Wang et al., 2009

#### Natural V/S Synthetic Pyrethroids: Structure And Activity.

Pyrethroids form a class of pesticides used across the globe for its wide range of applications. It is a group of man-made pesticides similar to the natural pesticide pyrethrum, which is produced by chrysanthemum flowers. Pyrethroids are found in many commercial products including the insecticides used at households, pet sprays and shampoos. Some pyrethroids are also used as lice treatments applied directly to the head and as mosquito repellents that can be applied to clothes. Natural pyrethroids are known over centuries for their insecticidal activity (CPCN, 2001) while the first synthetic Pyrethroid was developed in 1973. Synthetic pyrethroid is more stable to light than natural pyrethrum and possess better insecticidal activity. The first pyrethroid (fenvalerate) was commercialized in 1978. Currently, the class of pyrethroids includes 42 active ingredients, differing in chemical structure or in relative stereoisomer composition (NPTN, 1998). Natural pyrethrins are esters of a cyclopropane carboxylic acid and a cyclopentenolone alcohol. Structural modifications to one or other of these moieties have produced the diverse range of pyrethroids that are commercially available as insecticides (WHO/CDS/WHOPES/GCDPP/2005.10 WHO/PCS/RA/2005.1)

#### Route of Pesticides Leading In Aquatic Systems

Pesticides reach the aquatic systems by different ways, such as agricultural run offs, leaching, effluent waste, spills, excess use of aerosol sprays, etc. There are different ways employed for the assessment of the concentration of pesticides entering in the water body but it is primarily carried out by the assessment of three major routes (Kosygin et al., 2007; Sarkar et al., 2008). These routes are water column, organic substrates such as mosses, algae, leaf litter, vascular hydrophytes and branches, and inorganic substrate including materials from sediments varying in size (Murthy et al., 2013). Standing water has higher pesticide concentration than lithic biotopes and water column while its quantity is negligible in sediments (Kingsbury and Kreutzweiser, 1980). Though all the pesticides do not bio accumulate but those which undergo bioaccumulation can cause serious health hazards.

#### MECHANISMS OF TOXICITY

Pyrethroids are traditionally divided into two types, according to their chemical structure. Type I pyrethroids, are one which do not contain an alpha-cyano group in their molecule (for example, allethrin, resmethrin, D-phenothrin, and permethrin). whereas, type II pyrethroids do contain an alpha-cyano group (for example, deltamethrin, cypermethrin, cyfluthrin and fenvalerate).

*Type I pyrethroids* are known to cause tremors (T-syndrome) while type II causes choreoathetosis and salivation (CS-syndrome) (Tordoir et al., 1994). But, it should be noted that the syndromes are dependent on the animal model used. Many pyrethroids, such as permethrin, exhibit both T and CS characteristics, and sometimes these two syndromes combine (Soderlund et al., 2002, Aldridge, 1990). The toxicity of pyrethroids in mammals and insects are caused by similar mechanisms, so the properties are usually correlated. The marked difference in the toxicity of pyrethroids to insects (target organisms) and mammals is apparently caused by differences

mainly in the voltage-sensitive sodium channels (Narahashi, 2000; Soderlund et al., 2002). Pyrethroids impair ion transport through the membrane of nerve axons, causing muscular paralysis in the insect; death seems to follow a nervous system impairment that occurs a few minutes after pesticide absorption (Reigart & Roberts, 1999; MuellerBeilschmidt, 1990). Pyrethroid insecticides act on the nerves of both insects and higher animals, causing a temporary increase in sodium permeability of the nerve membrane during excitation. This action results in relatively short trains of repetitive nerve impulses in sensory (afferent) nerve fibers (Pollack et al., 1999). Pyrethroids without an alpha-cyano group (type I pyrethroids) cause a moderate protraction of the sodium channel permeability in the nerve membrane, while alpha-cyano pyrethroids (type II pyrethroids) cause a long-lasting protraction of sodium permeability of the nerve membrane during excitation 88 (EXTOXNET, 1994a–e; EPA, 2000). Invertebrates and some cold-blooded species are more susceptible to the toxic effects of pyrethroids than vertebrates (Narahashi et al., 1998). Repeated oral doses to rats for 7 days induce axonal degeneration to the sciatic nerve. Degeneration, however, occurs only with doses high enough to cause death in some other treated rats (Aldridge, 1990). The interaction of pyrethroids with macromolecular components of the sodium channel is reversible. Removal of pyrethroids from the nervous system is rapid: a 50% recovery of effects has been shown to occur from 30 minutes to 3–4 hours after poisoning (Aldridge, 1990). Interaction with sodium channels is not the only mechanism of action proposed for pyrethroids in insects and vertebrates (Ray & Forshaw, 2000). Some authors have suggested that the effects on the central nervous system depend on an antagonism of gamma-aminobutyric acid (GABA)-mediated inhibition, modulation of nicotinic cholinergic transmission, enhancement of noradrenalin release, or action on calcium channels. GABA is an important mediator of inhibitory neurotransmission in the mammalian nervous system and a target site for the action of several therapeutic drugs and toxicants. Release of GABA by presynaptic nerve terminals activates a chloride channel on the postsynaptic membrane, leading to hyperpolarization of the postsynaptic nerve terminal and thus enhancing the excitatory threshold of the postsynaptic neuron. This would result in an indirect neuroexcitatory effect. However, since some studies in vitro show that the GABA receptor blockade is not observed at concentrations of pyrethroid that disrupt sodium channel function, it is unlikely that GABA inhibition represents the primary mechanism of action, thus explaining the neuroexcitatory effects of pyrethroids (Soderlund et al., 2002). Neurotransmitter release is probably secondary to the increased sodium entry in the neural cell (Ray & Forshaw, 2000).

### TOXICOKINETICS

Absorption of pyrethroids through the gastrointestinal tract and the skin is variable and depends on the vehicle of administration (Soderlund et al., 2002; Bateman, 2000; Clark, 1995). From comparative toxicity studies it has been concluded that absorption from the respiratory tract is effective. While for the general population the main route of exposure to agricultural pesticides is through residues in food, studies carried out on workers suggest that, similarly to any other pesticide, dermal exposure is the most significant route of absorption for agricultural applicators and sprayers (Zhonghua et al., 1991; Zhang et al., 1991). The exposure scenario for pesticides used for public health purposes is quite variable, from exposure to larvicides in drinking-water, to dermal and inhalation exposure from bed nets, or from space spraying and vapor of household insecticides (e.g. mosquito coil). The penetration of pyrethroids into the skin is slow and may cause a typical local paraesthesia (tingling and burning sensations), which may persist for several hours (Bateman, 2000). After absorption, pyrethroids are rapidly distributed throughout the body, mainly in the adipose tissue, stomach, intestine, liver and kidneys and the nervous system. Pyrethroids are rapidly and extensively metabolized, mainly in the liver, by hydrolases and cytochrome P450-dependent mono oxygenases, with the breakdown of the molecule at the oxygen bridge and the formation of acids and alcohols which typically exhibit lower acute toxicity than the parent compounds and which are not indicated as causative agents for long-term effects (Soderlund et al., 2002; Crawford, 1981; NPTN, 1998; EXTOXNET, 1994a–e).

Pyrethroids do not accumulate in the body and their excretion is rather rapid, even after repeated administrations typically, 90% of the administered dose is excreted in urine and faeces within a week after treatment (IPCS, 1999; Aldridge, 1990; Vijverberg & van den Bercken., 1990). Studies carried out on human volunteers have shown that, after oral administration of cypermethrin doses of 0.25, 0.5, 1 and 1.5 mg/subject, about 75% of the dose is excreted in 24 hours; the rate of excretion is similar for all dosages. After a 2-day period, no detectable amounts of metabolites were found in urine (van Sittert et al., 1985). The ratio of excretion between urine and faeces varies with the compound and the route of administration (Soderlund et al., 2002, Vijverberg & van den Bercken, 1990). Non-metabolized pyrethroids (allethrin, bifenthrin, cyfluthrin, cyhalothrin, cypermethrin, fenpropathrin, flucythrinate, fluvalinate, permethrin, pyrethrins, tetramethrin, but not deltamethrin, esfenvalerate, fenvalerate) were detected in breast milk from women not exposed to pyrethroids at work, at concentrations of 0.015–0.34 mg/kg fat (Zehringer & Herrmann, 2001).a

### **Pesticide Induced Behavioral Changes.**

Pesticides have shown different alteration in behavior of various fish species such as sluggish movements and altered swimming ability, reduced appetite, maintain their position and defend their territories (Prashanth et al., 2011). Pesticides have also shown interrupting the schooling behavior (Gill and Raine, 2014) due to dangling, erratic and irregular movements and disturbed swimming. On account of stress due to pesticides, fishes became stressed and immune compromised, which make them more susceptible and vulnerable to diseases, secondary infections and pathogens (Satyavardhan, 2013; Nwani et al., 2010). Methyl parathion resulted in increased movements of opercula, rapid jerk movement, equilibrium loss, body colour alterations, frequent surfacing, and elevated mucus secretion in *Catla catla* (Ilavazhahan et al., 2010). Cypermethrin caused darting, erratic and irregular swimming movements, equilibrium loss, hyper excitability and sinking to bottom in *Labeo rohita* (Marigoudar et al., 2009). Cypermethrin resulted in jumping, increased surface activity, balance loss, increased air gulping, equilibrium loss, abrupt swimming, sluggishness, motionlessness, adopting vertical positions and internal haemorrhage in *Tor putitora* (Ullah et al., 2014c). Sodium cyanide induced certain behavioural changes such as hypexcitability, darting and erratic movements, and imbalance swimming, in *Oreochromis mossambicus*, *Catla catla*, *Cirrhinus mrigala*, *Labeo rohita*, and *Cyprinus carpio* (David et al., 2012). Many studies conducted so far have depicted confirming behavioural changes in fish due to pesticides (Scott and Sloman, 2004; Krian and Jha, 2009; Prashant et al., 2011; Rani and Kumaraguru, 2014).

### **Pesticide Induced Changes In Oxygen Consumption**

Different studies conducted put forth the results of reduction or increase in oxygen consumption by various fish species when exposed to different pesticides. These fish showed these changes with different time and duration of exposure such as Dimethoate (Shereena et al., 2009) and lead (James et al., 1993) induced toxic changes in oxygen consumption in *Oreochromis mossambicus*. Dimethyl parathion disturbed the oxygen consumption in *Labeo rohita* (Bengeri et al., 1984), a remarkable increase in respiratory rate and operculum movement is seen in the initial stage of exposure followed by gradual reduced gill respiration and opercular movement. Surface swimming is also seen.

### **Pesticide Induced Changes In Protein Contents of Fish**

Experiments have shown higher effect of pesticides in protein contents, in different tissue such as gills, liver, blood, intestine and muscle of various fish species, such as nickel caused decrease in protein level of *Heteropneustes fossilis* (Nanda et al., 2000), nickel chloride caused appreciable decrease in gonads, liver and muscles of *Anabus testudineus* (Jha and Jha, 1995), phenyl mercuric acetate caused reduction of protein level in muscles and liver of *Channa punctatus* (Karupphasamy, 2000) while the same species showed low protein level when exposed to oleandrin (Tiwari and Singh, 2004) and arsenic (Hota, 1996). Nuwan decreased protein contents in liver of *Mystus vittatus* (Tazeen et al., 1996), copper in *Lepidocephalichthys thermails*, lead acetate in *Cirrhinus mrigala* (Ramalingam et al., 2000), endosulfan in *Cyprinus carpio* (Jenkins et al., 2003), cypermethrin in *Labeo rohita* (Veeraiah and Durga-Prasad, 1998), petroleum oil in *Heteropneustes fossilis* (Borah, 2005), and lead, mercury and cadmium in *Channa straiatus* (Palanisamy and Bhaskaran, 1995).

Cypermethrin exposure resulted in significant decrease in protein contents in *Tor putitora* (Ullah et al., 2014) and *Colisa fasciatus* (Singh et al., 2010). Malathion caused decreased protein content in *Labeo rohita* (Thenmozhi et al., 2011) and *Clarias batrachus* (Khare and Singh, 2002). Thiamethoxan affected liver total protein of *Oreochromis niloticus* (Bose et al., 2011), thiodon significantly affected liver total protein in *Clarias gariepinus* (Aguigwo, 2002) while dichlorvos showed significant impact in total protein, tissue glycogen and albumen content in muscles, liver and kidneys of *Oreochromis mossambicus* (Lakshmanan et al., 2013). A pesticidal mixture used against *Clarias batrachus* induced changes in protein content (Jha and Verma, 2002), karate decreased protein contents in *Cyprinus carpio* (Bibi et al., 2014) while monocrotophos decreased protein, lipid and carbohydrate content in various tissues of *Labeo rohita* (Muthukumaravel et al., 2013). Also, in a complex pathway, dioxin interacts with DNA to alter how genes control protein synthesis, for example the protein called vitellogenin involved in egg development (Zorriehzahra, 2008).

### **Pesticide Induced Biochemical Changes/ Oxidative Stress in Fish**

Various studies have shown devastating effects of pesticides in various biochemical activities (Ullah et al., 2014). These changes in antioxidants systems of fish are often tissue specific such as these changes have been traced in brain, gills, muscles, kidneys, lungs and viscera of different fish and have shown varying results in different organs and different fish species such as peroxidase activities was found higher in brain, viscera, gills, and muscles of tilapia but gills was the organ received highest disturbance in peroxidase (Ahmad et al., 2000). Similarly changes in lipid peroxidase have been observed on account of different pesticides as well as environmental pollutants. Cypermethrin induced very much change in Catalase, Glutathion Reductase,

Peroxidase, and Lipid peroxidase in brain, liver, gills and muscle tissues of *Tor putitora* (Ullah et al., 2014c) while catalase, hydrogen peroxide, malondialdehyde, protein carbonyls and free amino acid in liver of *Labeo rohita* (Marigoudar et al., 2012). Sodium cyanide caused steady decreased with time in different enzymatic activities such as succinate dehydrogenase, lactate dehydrogenase, phosphorylase, glucose-6-phosphate dehydrogenase, acid phosphates and alkaline phosphatase in different tissues such as liver, gills and muscles of *Labeo rohita* (Dube et al., 2013) and catalase in *Cyprinus carpio* (David et al., 2008). Many other studies are depicting pesticides as inducer of anomalous biochemical changes in fish (Joshi et al., 1981; Swetharansym, 1991; Silvia et al., 1994; Anusha et al., 1996; Cookson and Pentreath, 1996; Geetha et al., 1999; Luther et al., 1999; Kamble and Muley, 2000; Jiraungkoorskul et al., 2003; Shankar et al., 2005; Milaeva, 2006; Neto et al., 2008; Nwani et al., 2010; Muthukumaravel et al., 2013).

### Histopathological Changes

Significant changes were studied in fish liver, gill, kidneys, brain, and muscles. Necrosis of the primary gill lamellae and a major necrosis of the secondary gill lamellae were found in *Oreochromis mossambicus*

### CONCLUSION

This article concluded that pesticides have deleterious effects on various aspects of fishes as well as mammals. This can create a great economic loss caused due to fish mortalities. On one hand fish mortalities while on the other hand these dead and polluted fishes renders them unfit for human consumption. When consumed, these fish can cause health hazard situation. From a health perspective this article focuses on the selection of fish taking necessary precautionary measures whether for direct consumption or for making any other use. Because not only the consumption can be risky but also the handling this contaminated fish for long hours can be dangerous too. From a pesticides viewpoint such pesticides should be avoided or should be used to minimum for protecting aquatic life as well as to keep the environment safe for all other organisms. Researchers all across the globe have worked on the toxic effects of pesticides in fish and have concluded that modifications such as behavioral change, Histopathological alterations, hematological and biochemical change, AChE activities inhibition, decrease in protein and lipid contents, change in life cycle, carcinogenesis, mutagenic changes, physiological changes and change in reproductive process are seen due to the use of such pollutants.

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**SUSTAINABLE DEVELOPMENT GOALS IN SAUDI ARABIA'S VISION 2030- ITS CHALLENGES AND OPPORTUNITIES**

**Sana Irfan Khan**

PhD Scholar, University of Mumbai, Mumbai

**ABSTRACT**

*The country knows for their richness of Natural Resources (crude oil), that's The kingdom of Saudi Arabia. The Kingdom of Saudi Arabia well known for its oil. But now it's the oil-based economy is changing into a non-oil economy. This transformation comes under a vision that the package of upgrade and advance vision changes the oil rental country into a non-oil-based economy country. That's vision is Saudi vision 2030. This Vision under so many programs which help to transform the economy and also Sustainable Development Goals. Under this vision, SDG has 17 goals and 6 points to achieve. SDG under the Ambitious pillar of the vision 2030.*

*In this paper, we look at the challenge and opportunities which facing Saudi Arabia.*

*As its rich in Natural Resources now it's an oil-based economy toward green and sustainable development.*

*Apply Descriptive and explanatory research methodology to analyze challenges and opportunities in this paper.*

**INTRODUCTION**

Sustainable Development Goals are an important goal for every country in the world. As the rapidly changing climate so it's necessary to look at this issue. Sustainable Development Goals help to develop the condition of the environment. SDG is defined as an approach to evolving or growing by using resources in a way that allows for them to renew or continue to exist for others. Using recycled materials or renewable resources when the building is an example of sustainable development. The kingdom of Saudi Arabia's vision 2030 to facilitate the SDG. This vision has 17 goals to obtain the SDG. By dint of a Royal Order, the Minister of Economy and Planning is assigned with the commission to follow up and coordinate with relevant entities on Sustainable Development Goals' dossier the Ministry of Economy and Planning (MEP) plays a supporting role to stakeholders and government mechanisms in strategic planning and implementation.

This research paper analysis the SDG in the kingdom of Saudi Arabia's vision 2030. By using the descriptive research methodology to describe the SDG in the vision and by the exploratory research methodology to explore the plans of the vision and try to understand its challenges and opportunities of the SDG in the vision.

**KINGDOM OF SAUDI ARABIA'S VISION 2030**

The crown Prince Mohammed bin Salman launched this strategic vision in 2016. The aim of this vision makes transform Saudi Arabia rental country into a dependent country. As 90 per cent of revenue coming to crude oil exports. This vision aims to diversify the economy into various sectors with the SDG and make it none oil economy.

The Kingdom of Saudi Arabia regional status and dignity facilitates it to take a leading role as the “heart” of Arab and Islamic nations, the Kingdom will use its investment power to create a more varied and sustainable economy. The Kingdom will use its strategic location to connect the three continents of Africa, Asia and Europe. This vision has three main pillars which well describes the vision.



**THREE MAIN PILLARS**

1. A Vital society
2. The Thriving economy
3. An Ambitious Nation

These pillars are combined to accomplish the objectives of the Kingdom.

**A Vital Society-**

**With Strong Roots.** The Kingdom will continue to excel in performing its responsibilities towards pilgrims, and it is proud of its deep-rooted national identity. This year 2021 showed the up-gradation for the pilgrims.

**Life Fulfillment.** The satisfaction of citizens and residents is important to the Kingdom's leaders, and this can be achieved by ensuring social well-being, good quality of life, a healthy lifestyle and a positive living environment.

**With Strong Foundations.** The Kingdom will strengthen the core family values, provide education that builds children's character, and establish empowering health and social care systems.

**The Thriving Economy**

- Economy
- Rewarding opportunities
- Investing for the long term
- Open for business
- Leveraging its unique position

**An Ambitious Nation**

- Effectively governed
- Responsibly enable

This is a small overview of the Saudi Arabia vision 2030. By these pillars are and themes are the backbone of the vision 2030. This has the 17 goals of Sustainable Development in the vision 2030. The 17 sustainable development goals (SDGs) Identified by the United Nations (UN) can be used as the roadmap in the second stage to guide the urban planner and government officials to develop national plans to achieve the 2030 vision for sustainable future. The rest of this paper will focus on the 17 SDGs attainable in the 2030 vision of the KSA. Section 2 highlights the 17 SDGs set by the UN and Section 3 gives an overview of the KSA's 2030 vision. In Section 4, the Threshold21-iSDG model developed by Millennium Institute(MI) has been used to assess the performance for SDGs attainments in the KSA's vision. Saudi Arabia embarked on a process to align its national strategies in various sectors with the SDGs. The Ministry of Environment, Water and Agriculture (MEWA), for example, issued the Water Strategy and the Environment Strategy, which are aligned with The SDGs, with sufficient integration of social, economic and environmental dimensions. As the Kingdom of Saudi Arabia consistently accords due attention to education as a key driver to advance development, a Royal Order was issued to include the SDGs into education curricula. Work is in progress towards this end, led by the Ministry of Education, in partnership with public and private stakeholders.

Furthermore, work is underway to develop more strategies and plans, which are designed to promote national frameworks' coverage of the SDGs.

**17 GOALS OF THE SUSTAINABLE DEVELOPMENT**

The 17 SDGs are blueprint which aim to shape the global economic growth that provides no poverty, equality, prosperity and peace and justice. They address the challenges related to essentials social needs for humanity like education, health, social protection, employment and other services while maintaining the standards for climate and environment.

An inspection of linkages between the Vision 2030 goals and the 17 The SDGs conducted as part of the analytical endeavor for this review found that an important degree of alignment exists between the two frameworks. Key preferences include enhancing the role of The SDGs at the sub-national level, enhancing the Monitoring and Evaluation (M&E) infrastructure for tracking progress towards the achievement of The SDGs at

the national and sub-national levels and promoting international coalitions around the SDGs through development assistance, especially at the regional level.

Sustainable development plans have been keen to extend development to all social and economic sectors across all provinces. In the context of enforcing its development strategy, Saudi Arabia draws upon Islamic principles and values as well as on economic freedom, so as to integrate the three basic dimensions of development: economic, social and environmental. The context of its efforts to collect this review, MEP conducted workshops and held intensive bilateral meetings with a number of government agencies. These included the Ministry of Energy, Industry and Mineral Resources, Ministry of Municipal and Rural Affairs, Ministry of Transport, Ministry of Environment, Water and Agriculture, Ministry of Health, Ministry of Labor and Social Affairs, Ministry of Foreign Affairs, Ministry of Interior and the Ministry of Education. Other organizations included the Public Investment Fund (PIF), General Authority for Statistics (GASTAT), Saudi Commission for Tourism and National Heritage (SCTH), Arriyadh Development Authority (ADA), Royal Commission for Jubail and Yanbu (RCJB), Royal Commission for Al-Ula (RCU), Saudi Fund for Development (SFD), Saudi Energy Efficiency Center (SEEC), King Salman Humanitarian Aid and Relief Centre (KSrelief) and the Family Council. These workshops and meetings were also attended by several private sector and helpful societies and institutes, most notably Saudi Basic Industries Corporation (SABIC), ACWA Power Corporation, Prince Mohammad bin Salman bin Abdulaziz Foundation “MiSK”, King Khalid Foundation (KKF) and Bunyan Women's Charitable Association.



## CHALLENGES

According to research paper's methodology these are some challenges of the Sustainable Development Goals of the kingdom Saudi Arabia's vision 2030. This vision has design such strategies to deal these are challenges by the different workshops and programs.

- Environmental: Air quality deterioration in urban area. High energy demand and consumption due to regional population growth and economic development.
- Safe drinking water: supplies due to a scarcity of fresh water.
- Industrial pollution.
- Waste management.
- Pollution in coastal area.
- Subsequent stress on marine ecology system are major environmental challenges.
- International investment issue due to pandemic.

## OPPORTUNITIES

As we discuss about the Saudi Arabia's vision 2030 has the aim of the economy diversity of the country. So here this vision 2030 work on the tourism as the strong point of the county since ancient time. As the Saudi Arabia is main center of the Muslim holy places Makkah and Madinah. Every year thousands of the pilgrimages visit the county for Hajj and Umrah. But now Saudi Arabia divers their tourism to heritage place where the number of the other different place to explore. Under the vision 2030 here is mega project of the Saudi Arabia

to tourism and part of the sustainable development. This mega project recently launched by the crown prince Mohammad Bin Salman. The mega project is NEOM- The Line.

In this project Saudi Arabia invest \$500 billion. The Line its help to diversify the economy which main aim of vision 2030. The plans for Neom are far grander. The latest vision centers around a 106-mile-long carbon-neutral project called the Line, a linear city connected by a high-speed train, with no cars.

The NEOM- The Line its being built in Tabuk provision of Saudi Arabia the area is locate near to the Gulf of Aqaba and opposite strait of Tiran, opposite side of Sham El Sheikh in Egypt(this Egypt city economically well developed and spot of tourism, where are luxury resorts and desirable spots of tourism.



Another opportunity- as part of the study included the following six significant environmental aspects: land use, energy use, water use, transportation, and the management of solid waste and wastewater. Despite the current challenges, there are also a great number of opportunities that will enable the conversion of Saudi's downtown areas into more sustainable neighborhoods. For example, the use of renewable energy sources, such as solar energy, represent a tremendous opportunity for the country, and densely populated areas of cities are deemed a positive feature when building public transportation systems.

Meanwhile, the heritage features of these downtown areas, including their traditional mud-based buildings and old markets, clarify an excellent opportunity for developing the districts into destinations for both local and international tourists. These examples of likely opportunities alone represent areas of enormous ability that will go an important way to benefiting the achievement of the Saudi 2030 Vision, and improving the diversification of the country's energy production plan. This in turn will boost the economy and living norms across the Kingdom.

## METHODOLOGY

In this research paper used descriptive research methodology to describe the vision 2030. Under the descriptive methodology expand and well describe the opportunities and challenges of this vision under the SDG. By the exploratory method explore the vision 2030 in the light of the SDG.

## CONCLUSION

Saudi Arabia is currently highly conditional on unsustainable exercises. Hence, this the study pursued to identify the current challenges and the potential opportunities for enforcing sustainable development principles in future, to support the achievement of the Saudi 2030 Vision. This research paper has identified the opportunities and the challenges of the Kingdom of Saudi Arabia. The aim of vision 2030 is to diversify the economy. These sustainable development goals help to do so with the planned strategies. Under the vision the KSA used solar energy, they explore their tourism sector and progress towards the achievement of The SDGs. In the social sphere the country has modernized the social welfare system and made it more empowering, efficient and fair. A range of social protection strategy provide the population with adequate income, child care, elderly pensions and care, support for women and other types of social assistance. Subsidies for fuel, water, food and electricity have been redirected to those in need and the less privileged citizens, leading ta a more equitable distribution. In addition, the Citizen Account program has been established to alleviate the impact of

the reform on affected families. In the area of human development, Saudi Arabia has invested considerable resources in healthcare and education which have resulted in significant improvements in health and educational outcomes. Modifications have also been evidenced in food and water security, sustainable agriculture, labor market participation, etc. Saudi Arabia has taken several measures aimed at boosting the status of women in the society, such as the association of a national lookout of women's participation in societal and economic affairs, the launch of an electronic portal that allows job seeking women to register and obtain information on job opportunities in all provinces, a program helping the transport of working women, a program furnishing childcare for working women, many other opportunities.

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**SUCCESSFUL CAREER & LIFE FOR STUDENTS - A HOLISTIC & QUALITATIVE REPORT ON HOW SSB INTERVIEW INCREASES THE RATE OF SUCCESS IN LIFE**

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**Ujjwal Chugh**

Founder of the Community “SSB Recommendation Blueprint Journey”

Founder &amp; CEO, ISOLS Group

Author: How To Crack SSB Book

connect@ujjwalchugh.com

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**ABSTRACT**

*This research & study is to show that the rate of success in life & career becomes high for all those who undergo with SSB Interview (A selection procedure for becoming an officer in Indian Armed Forces) once in their student age. A survey was conducted with 75 plus people from different cities in India who have given SSB Interview. Even though many of the students who failed in SSB Interview to get the recommendation, have been able to do good in their life since they gave & experienced the SSB Interview in their life.*

**Keyword:** SSB Interview, Service Selection Board, Career Success, Student Success, Successful life.

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**1. INTRODUCTION**

For getting commissioned i.e. becoming an officer in Indian Armed Forces (either Indian Army or Indian Air Force or Indian Navy) there are various options or entry points starting from school (10+2), college graduation and after graduation. Every entry point has a criteria with a written test or evaluation test, and once you clear the first stage of written or evaluation test then the second stage irrespective of the entry scheme is the ‘SSB Interview’. Thus SSB Interview is the main gateway that every candidate has to clear in-order to become a uniform officer of Indian Armed Forces.

SSB, Service Selection Board, as the name illustrates is a board that makes the crucial decision in the selection process. It is a group of highly skilled officers from the Indian Armed Forces, responsible for selecting the candidates by rationally analysing their personality traits which a candidate ought to possess by virtue of being the Commissioned Officer in Indian Armed Forces.

SSB is generally perceived merely as an interview. In-fact, interview is just one part in the SSB process. The SSB evaluation procedure is divided into two phases. Phase I comprises of screening test. For graduating into Phase II each candidate has to successfully clear Phase I. Phase II constitutes of three parts and is aimed at evaluating the overall personality of the candidate.

“SSB is a 5 days evaluation which needs expression of thyself in order to cross check the Officers Like Qualities.”

**SSB Tests = INTELLIGENCE + PERSONALITY + ENDURANCE test.**

*Service Selection Boards (SSBs):*

Total thirteen Service Selection Boards are there across India, out of which four boards are for the Indian Army, four boards are for Indian Air Force, and five boards for the Indian Navy selection.

*Composition of SSB:*

The vital aim of selection system in SSB is to assess each candidate on the basis of his OLQs (Officer Like Qualities) and then rationally and methodologically explore and grade the potential of each candidate on the basis of traits required for being an Officer in Indian Armed Forces. For exploring and grading the potential of each candidate, each Service Selection Board comprises of three different teams of Officers:

1. The Psychologist
2. The Interviewing Officer
3. The Group Testing Officer

The above described composition of SSB forms a full-proof and accurate selection system.

**1.1 Problem Statement / Research Question:-**

Does preparing for SSB Interview increases your probability or rate of overall success in your career and life?

**1.2 Objective of Study:-**

- ✓ To analyse does SSB interview changes the mindset of the students appearing it.
- ✓ To Study the importance & impact of strategies & procedures used in SSB for evaluation.
- ✓ To find out how SSB Interview preparation plays a progressive role in increasing the rate of your overall success in your career & life.

**1.3 Importance of the Research:-**

- ✓ This research will help practitioners/IAF Aspirants understand with clarity the SSB procedure system, the selection system wants & expectation, and how they are being assessed during the SSB.
- ✓ This research will help SSB Educators to understand the right & progressive way of training the IAF aspirants willing to become officer in IAF.
- ✓ This research will help Human Resource leaders & professionals to inculcate few procedures of SSB selection that can help them do better talent acquisition with higher efficiency & accuracy.
- ✓ This research will help enthusiasts in understanding that preparing for the SSB Interview will indirectly help them to get successful in other avenues of their career & life.

**2. METHOD (RESEARCH METHODOLOGY):-**

After clearing my own NDA written exam and getting the success in SSB Interview by getting recommendation twice consecutively in 2008 from 4 AFSB Varanasi SSB Board, the roots of this research paper started.

The research was started from the factual question: "Why selection ratio of SSB Interview is too low?" And this is the reality of SSB Interview that the recommendation ratio i.e. candidates clearing the SSB is too low, and that is why students had developed a notion that SSB is a toughest test & phase for getting into IAF.



NDA & CDSE are also the two entry schemes to get commissioned into Indian Armed Forces. The above chart shows approx. number of candidates applying within 6 months for the 1st stage (written exam) to get into IAF as an officer. The ones who will clear the written exam has to appear in SSB.

Interestingly, there has been shortage of officers in IAF but still the SSB selection ratio has been too low. Since I got successful recommendation from SSB board, and lot of aspirants preparing for SSB started approaching me, and then I got a strong inclination to research on this as I was successful in clearing SSB and I never found it tough which majority of students have developed their notion for the SSB.

Qualitative data research was started with the participants who have appeared for SSB considering three group of participants; the ones who failed in the SSB, the ones who succeed in their SSB phase, and the ones who were the serving officers in Indian Armed Forces. Since the outcome result of SSB i.e. the students getting successful recommendation from SSB was indefinite as intelligence is not just the only factor for recommendation, and at times even the candidate who is less spoken and not having very good communication is also getting recommended. Therefore, it calls for a qualitative research.

Both primary and secondary data were collected for beginning the qualitative research analysis.

- Primary Data:- It is the data of the students who are planning to appear SSB (they are fresher) and have been appearing for SSB (Failed & Succeed both) via One-2-One interview/interaction.
- Secondary Data:- It is the data from Blogs, Journals', and various other source of internet.

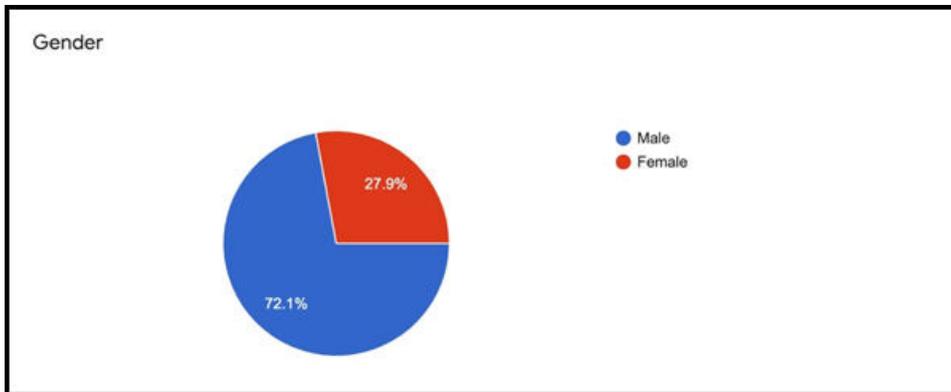
**3. SURVEY/INTERVIEW OF ASPIRANTS/STUDENTS:-**

More than 80 plus aspirant’s one-2-one data has been collected with the following set of questionnaire:

- FULL NAME
- GENDER
- ASPIRANT CURRENT STATUS? (FRESHER OR REPEATER OR RECOMMENDED CANDIDATE)
- CITY & STATE
- FAMILY BACKGROUND (PARENTS PROFESSION & EDUCATION AND ABOUT BROTHERS & SISTERS IF ANY)
- FROM WHICH ENTRY YOU ARE APPEARING FOR SSB?
- WHILE DOING YOUR SSB PREPARATION HAVE YOU OBSERVED ANY QUALITIES OR GOOD TRAITS YOU ARE ABLE TO INCULCATE IN YOUR PERSONALITY IN YOUR ROUTINE LIFESTYLE. (IF ANY, THEN DESCRIBE IN DETAIL)
- ONLY FOR SSB REPEATERS OF RECOMMENDED CANDIDATES (AFTER UNDERGOING REAL SSB ASSESSMENT HAVE YOU OBSERVED ANY QUALITY OR GOOD TRAIT THAT YOU ARE ABLE TO INCULCATE IN YOUR PERSONALITY IN YOUR ROUTINE LIFESTYLE?)
- WHAT IS YOUR CURRENT PROFESSION?
- WHAT HAVE YOU GAINED IN YOUR LIFE OR CAREER WHILE PREPARING FOR SSB OR BY GIVING SSB?

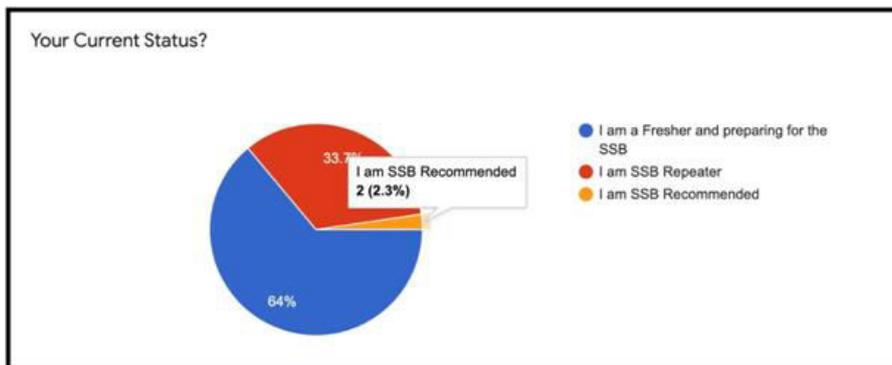
**3.1 Gender of the Aspirants Planning to appear or Appeared for the SSB:-**

Below given pie chart shows the percentage of male & female aspirants aspiring to get into Indian Armed Forces, and are inclined towards SSB stage.



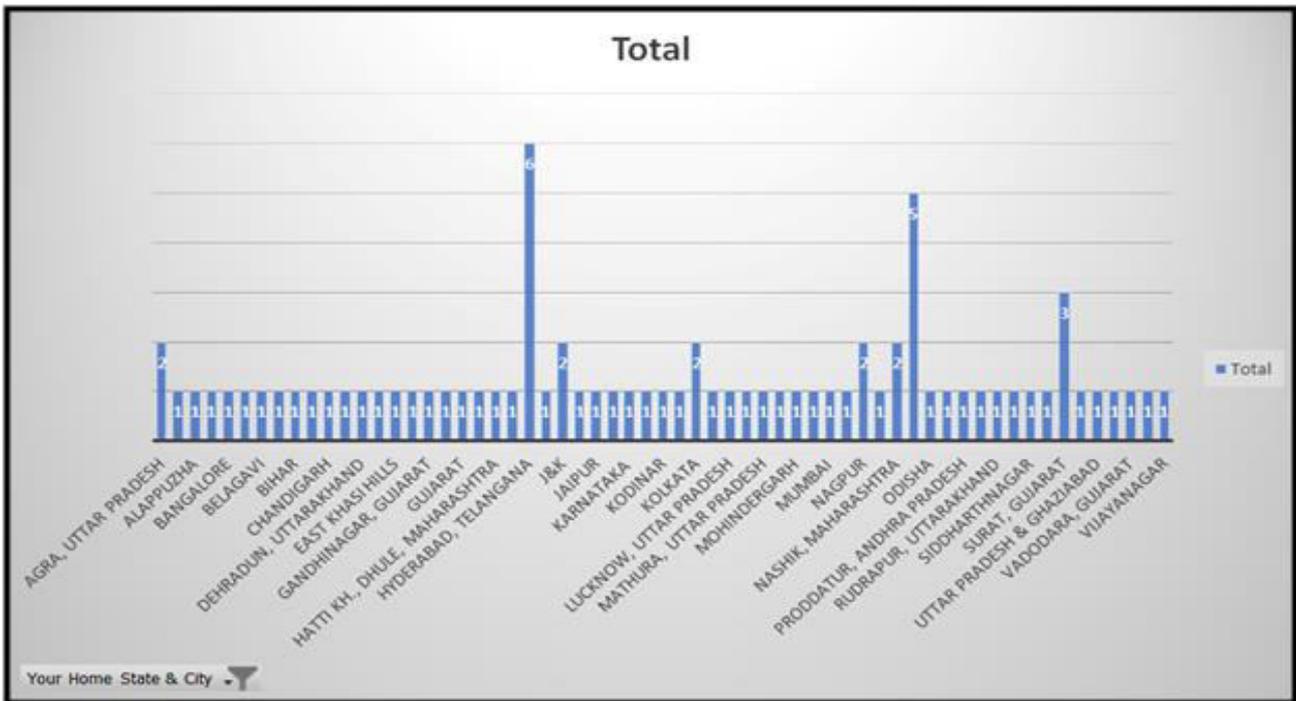
**3.2 Current Status of the Aspirants with respect to SSB:-**

Below given pie chart shows percentage of aspirants; those who are freshers & preparing for the SSB, those who are SSB repeaters (either got screened out or conference out and have gone multiple times) and those who have got successful recommendation from SSB Board.



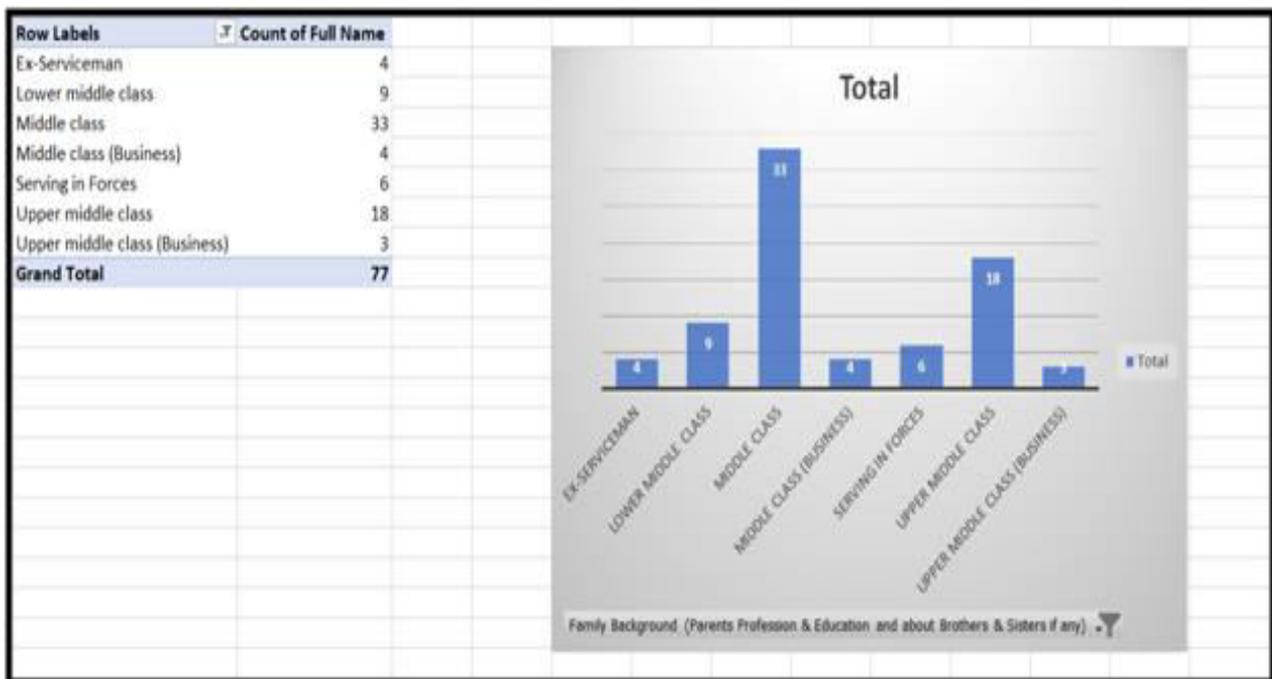
**3.3 Home State & City of Candidates/IAF Aspirants Surveyed:-**

Below given chart shows the State & City of the people aspiring to join Indian Armed forces and have been preparing for the SSB or they are the SSB Repeater or successful SSB Recommended.



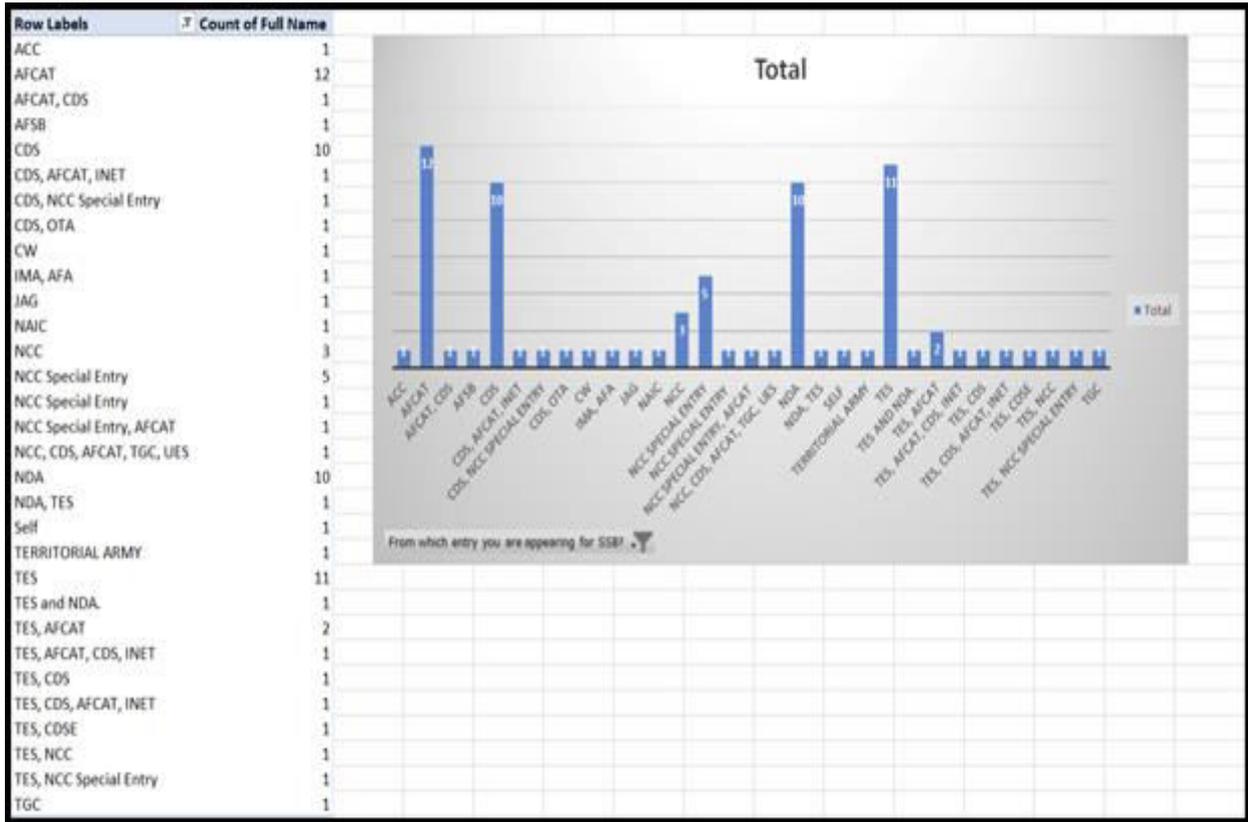
**3.4 Family Background of Candidates/IAF Aspirants Surveyed:-**

Below given graph shows the family background of the people aspiring to join Indian Armed forces and have been preparing for the SSB or they are the SSB Repeater or successful SSB Recommended.



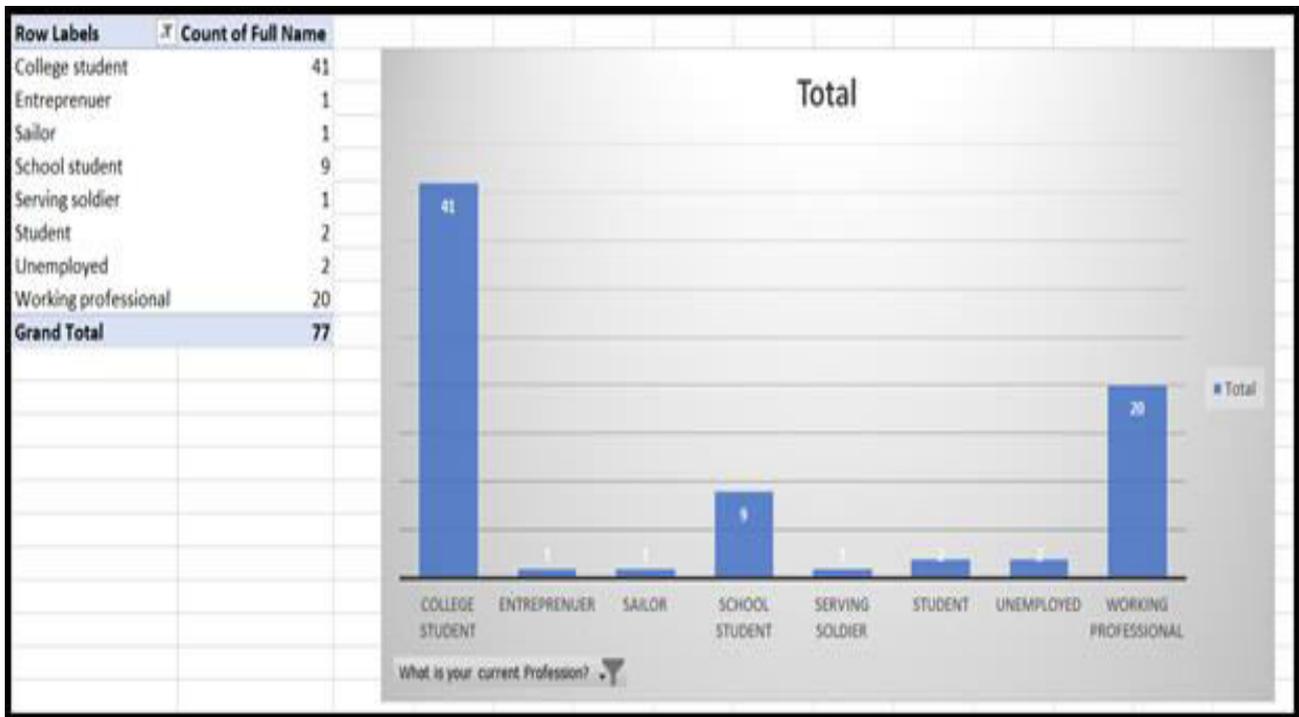
**3.5 Entry Schemes of IAF from which Candidates are Applying:-**

For getting into IAF and reaching the main stage i.e. SSB there are various entry points with different or specific entry criteria. For ex: NDA (This is 10+2 entry scheme), CDSE (Entry Scheme for Graduates), UES (Entry Scheme for Engineering Students). Given below is the graph showing the IAF entry scheme of the of the people aspiring to join Indian Armed forces and have been preparing for the SSB or they are the SSB Repeater or successful SSB Recommended.



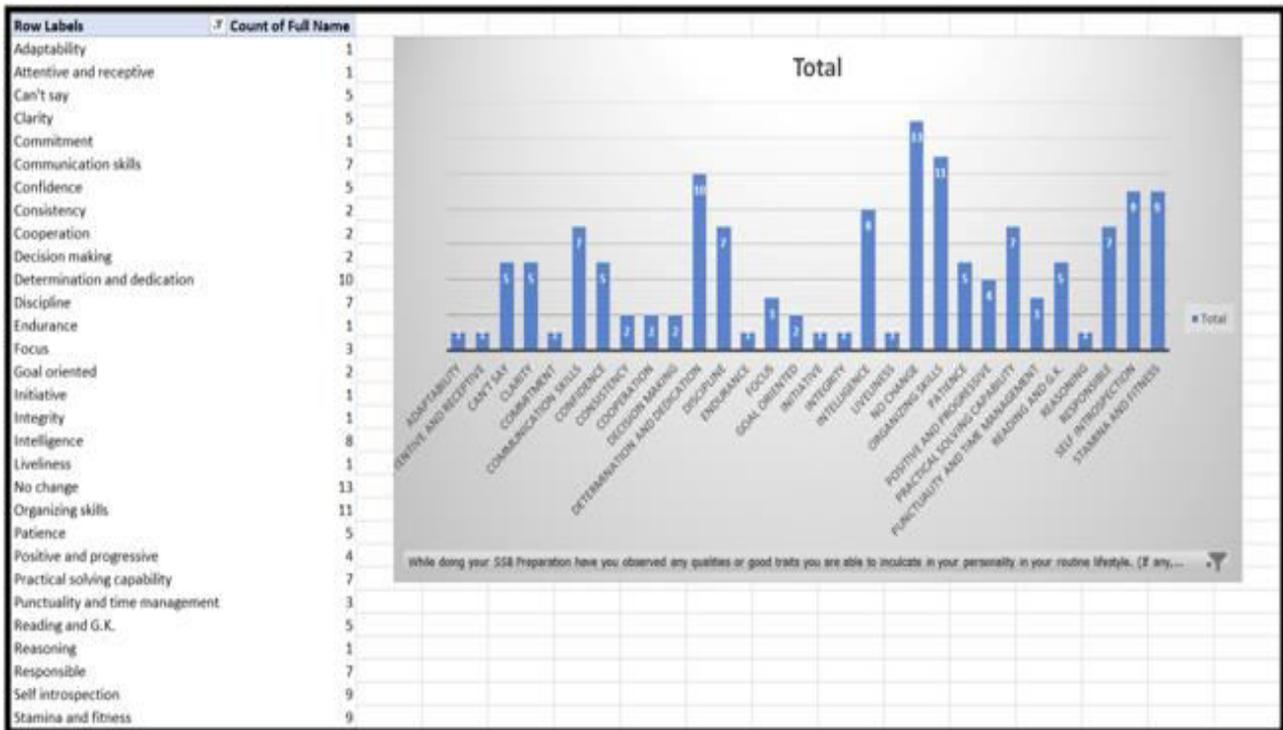
3.6 Current Profession of the Candidates/IAF Aspirants:-

Given below is the graph showing current profession of the people aspiring to join Indian Armed forces and have been preparing for the SSB or they are the SSB Repeater or successful SSB Recommended.



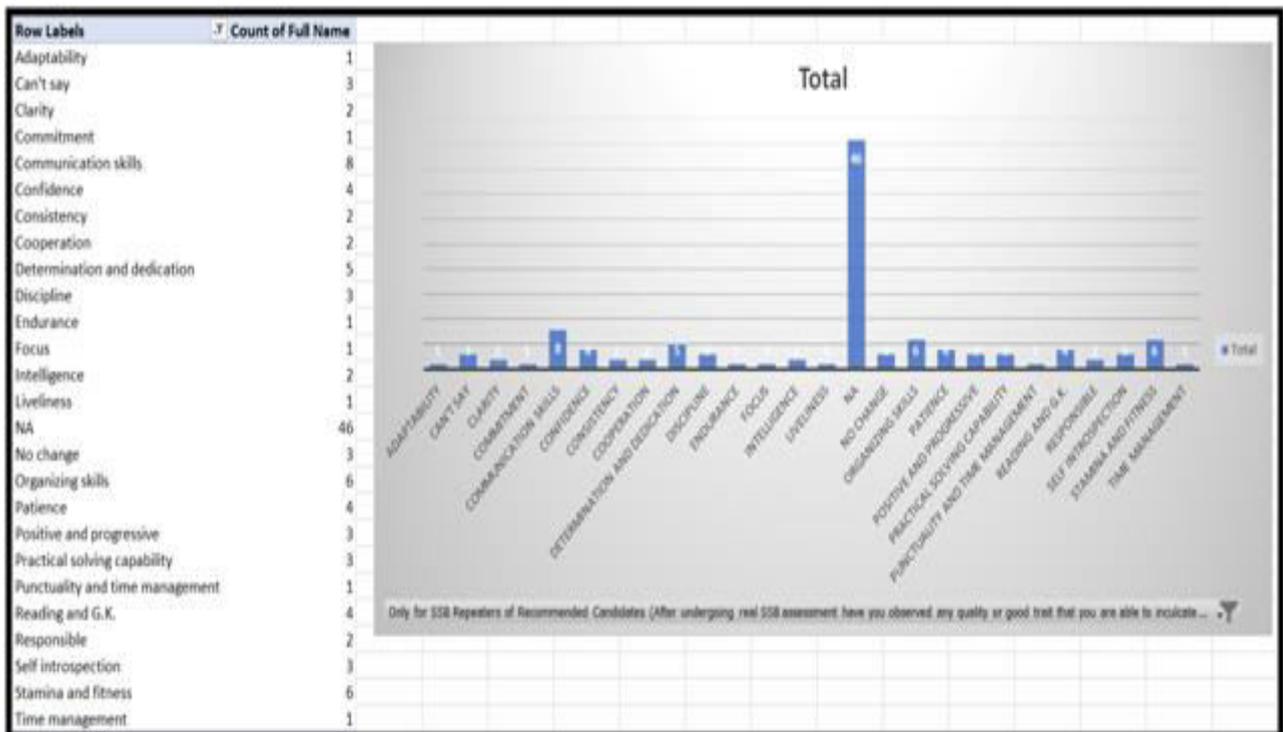
3.7 While doing SSB Preparation candidates observation about the qualities & good traits they have been able to inculcate in their personality in their routine lifestyle:-

After interviewing/surveying the aspirants, below given graph shows the various qualities & characteristics which the aspirants while *preparing for SSB* have been able to inculcate within their personality. These are those qualities which an aspirant requires directly or in-directly in the SSB also, and at the same point these are the qualities which determines person growth & upliftment in life & career.



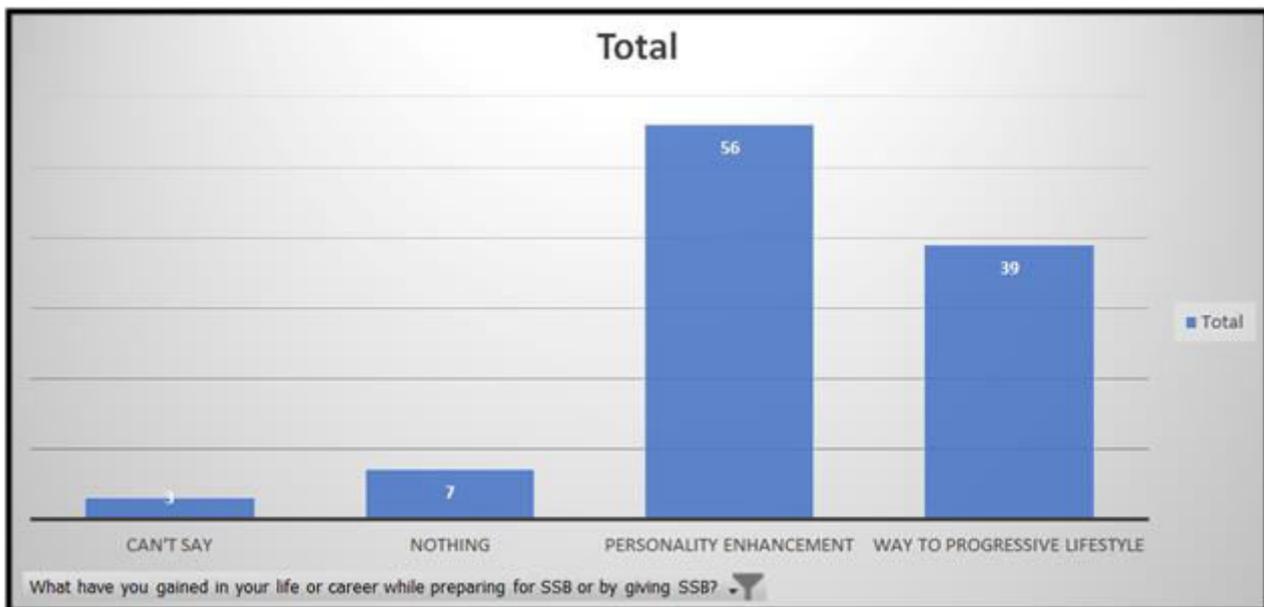
**3.8 After undergoing real SSB assessment candidates observation about the quality or good trait that they are able to inculcate in their personality in their routine lifestyle (If has only been answered by SSB Repeaters or Recommended Candidates):-**

After interviewing/surveying the aspirants, below given graph shows the various qualities & characteristics which the SSB Repeaters or SSB Recommended candidates while *undergoing realtime SSB assessment* have been able to inculcate within their personality. These are those qualities which an aspirant requires directly or in-directly in the SSB also, and at the same point these are the qualities which determines person growth & upliftment in life & career.



**3.9 What candidates have gained in their life or career while preparing for SSB or by giving SSB?:-**

After interviewing/surveying the aspirants, below given graph shows, at a macro level what the aspirants have gained while *preparing for SSB or undergoing realtime SSB assessment* within their self.



#### 4. POSITIVE IMPACTS OF SSB PREPARATION & REALTIME SSB ASSESSMENT ON THE IAF ASPIRANTS/CANDIDATES:-

- **76% aspirants** have gained a decent positive impact in their personality traits and characteristics while preparing for the SSB. Candidates have been able to inculcate traits like Adaptability, Attention & Receptivity, Clarity, Commitment, Confidence, Consistency, Communication Skills, Dedication, Determination, Endurance, Focus, Goal Oriented, Initiative, Integrity, etc as showed in 3.7.
- **80% aspirants** who have undergone the realtime SSB assessment have gained a very positive impact in their personality traits and characteristics. Candidates have been able to inculcate traits like Adaptability, Attention & Receptivity, Clarity, Commitment, Confidence, Consistency, Communication Skills, Self Introspection, Decision Making, Dedication, Determination, Endurance, Focus, Goal Oriented, Initiative, Integrity, etc as showed in 3.8.
- Out of total candidates interviewed; **87% candidates** have experienced a strong “*personality enhancement*” and have gained “*way to progressive lifestyle*” while preparing for SSB or after giving SSB.
- Majority of candidates have enhanced their personality traits while undergoing SSB preparation & realtime SSB assessment, and this gain in their personality & lifestyle has helped them to perform more efficiently in other spheres of life too thus, helping them succeed in their career & life.

#### 5. NEGATIVE IMPACTS OF SSB PREPARATION & REALTIME SSB ASSESSMENT ON THE IAF ASPIRANTS/CANDIDATES:-

No negative impact on candidates have been seen while they have undergone with the SSB preparation or realtime SSB assessment. It has been observed that 13% candidates found no change or they are not sure to say about any positive impact in their personality.

#### 6. RESEARCH & FINDINGS:-

- 1) **76% aspirants** have gained a decent positive impact in their personality traits and characteristics while preparing for the SSB.
- 2) **80% aspirants** who have undergone the realtime SSB assessment have gained a very positive impact in their personality traits and characteristics.
- 3) **87% candidates** have experienced a strong “*personality enhancement*” and have gained “*way to progressive lifestyle*” while preparing for SSB or after giving SSB.
- 4) It has been found that the candidates who prepared for SSB or appeared for SSB but unable to join Indian Armed Forces are doing well in their life & career; be it ever managing their day-2-day life or working in corporates or pursuing their entrepreneurial career.

The above finding of the research can also be validated from a below caste study:

Joining Indian Armed Force has also been a dream of lot many such people who failed to get recommended from SSB and were unable to join IAF. But later on they have done fantastically well in their life & career, and have become a very influential personality of their domain. Below is the glimpse of sun people:

**(i) APJ Abdul Kalam**

Dr. APJ Abdul Kalam was also one of those who had applied for the Air Force. He did make it to the interview stage but was rejected later. Remembering his stint with SSB, Dr Kalam said:

*“I appeared for the interview at DTD &P (Air) and did well at the interview. The questions were of a routine nature, and did not challenge my knowledge of the subject. Then I proceeded to Dehradun for my interview at the Air Force Selection Board. At the Selection Board, the emphasis was more on “personality” than on intelligence. Perhaps they were looking for physical fitness and an articulate manner. I was excited but nervous, determined but anxious, confident but tense. I could only finish ninth in the batch of 25 examined to select eight officers for commissioning in the Air Force and was deeply disappointed. It took me some time to comprehend that the opportunity to join the Air Force had just slipped through my fingers.”*

**(ii) Amitabh Bachchan**

The Bollywood giant, Amitabh Bachchan had also sat for the SSB and was rejected. He said:

*“I was a defence aspirant like you all who have appeared various times for the SSB. I tried couple of times but could not make it. Of course there are emotions, dissatisfaction and disappointments but you have to move ahead with life. Fortunately, I was destined for something else.”*

**(iii) Rahul Dravid**

Rahul Dravid's name is synonymous with the cricket greats of all times. He is one of the best cricketers the country has ever produced. Dravid too had a dream of joining the armed forces. He, however, could not clear the SSB. He proved his worth in the field of sports and became one of the best cricketers of all times. Dravid is still remembered for his sincere professionalism and love for the game.

**(iv) Shah Rukh Khan**

One of the leading actors of the Hindi film industry, Shah Rukh Khan too was a defence aspirant. He had tried his luck at the SSB but he did not succeed. His parents were also not too keen that he joined the army. Through sheer hard work and determination, Shah Rukh Khan went on to become one of the foremost actors of today's generation. He has also beautifully essayed the characters of army personnel in films like 'Veer Zaara', 'Jab Tak Hai Jaan' and 'Army'. His role as an army officer in the television series 'Fauji' catapulted him to fame.

**CASE STUDY CONCLUSION**

Just like the above few examples there are many examples of the people from different walks of life who wanted to get into IAF and have gone through & prepare themselves for SSB but were unable to get selected or join the forces, Still now they are joining very well in their life because while preparing consciously for the SSB & dream career IAF they have been able to transform their personality in many ways.

Even the roots of this research paper started with myself introspection. I have undergone SSB twice and got successfully recommended both the times but I was detected with 0.25 myopia in medical due to which I was unable to join Indian Air Force for which I am always passionate. After that I started my entrepreneurial career in the 2nd year of engineering and from that point the whole landscape of life & career has changed fantastically. Looking backwards when I tried connecting the dots and was trying to find the reason that how an ordinary person like me has been able to do all this and became versatile? So, I got a connect & traces that SSB and my passion for IAF has played a vital role in making of who I am today. And then to validate the same, the research started as I wanted to check that what other people gone through SSB feel and how they are doing in their life & career. With the research while doing interview/survey of candidates it got clear that SSB plays a very important reason in enhancing your personality to lead a better life & career and why it happens.

**8. CONCLUSION:-**

The SSB is one of the unique and finest assessment system that assess the true self and personality of the candidate. It has been designed so scientifically & logically in such a way that candidate's true self reflects automatically while undergoing this assessment. Therefore, candidate preparing for the SSB do not have to just train him/her at the skill level like other exams rather candidate has to undergo a series of self transformation at physical, mental & emotional level to achieve that point which results in his/her successful recommendation.

Based on the interview/survey done with the candidates preparing for SSB or have undergone the SSB assessment, majority of them have been able to inculcate various personality traits or qualities within their self and in their daily routine which clearly shows that candidates have achieved different level of transformations and based upon that they have shared their experience. Since, these transformations help in enhancing the overall personality and gives a way to lead a progressive lifestyle (both of these are important factors for leading a successful life & career), therefore, these candidates have a higher probability to get successful in life & career.

Hence, this is clearly validated from this research that rate of success in life & career becomes high for all those candidates who undergo with SSB Interview or preparing for the SSB.

**8. RECOMMENDATION:-**

SSB system is adding an overall value to the life of candidates who are preparing for it or undergoing the assessment even though they fail to get recommended. We can set SSB assessment as a guiding model for other examinations and assessment exams as well, few things from SSB assessment can be picked up and can be amalgamated with other exams standards to create value in candidate's life & career who is preparing or

appearing for the other exams. For ex: Corporates uses the few assessment types of Psychology module of SSB as SWOT test to analyse Strengths, Weaknesses, Opportunities, and Threats while hiring talents.

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## ABOUT AUTHOR

Ujjwal Chugh, is a young Entrepreneur, Author and Digital Visionary, currently CEO & Founder of ISOLS Group - A leading IT, Technology & Digital Company, and he has earned a distinction at various grounds and have won numerous of hearts. He is a dynamic versatile personality, always willing to demonstrate his great potential for innovation and to bring a transformation. Mr Chugh is a qualified Engineer in Information & Technology from IP University, and has an interest in exploring various prospects & opportunities of success and transformation through innovative ideas.

Prior his entrepreneurial career, he had a special craving to be a fighter pilot in the Indian Air Force. He cracked NDA and SSB twice with high aplomb but got medically unfit to serve Indian Air Force as he was detected 0.25 myopic. Thereafter, he started his entrepreneurial career, and simultaneously he contented his passion by joining Indian Air Wing for two years where he has flown the Microlite STOL 701 at No.1 Delhi Air Sqd (Flying Branch) representing Delhi at Vayu Sena Camp, Bengaluru as a Cadet. He has been inspiring & channelizing the youth for joining the Indian Armed Forces through his Top Rated "How To Crack SSB" Book having 1.4 lac followers, and by contributing his practical knowledge for the SSB Interview from where he got successful recommendation twice. Currently there is a large pool of aspirants are getting trained under him.

Moreover his book "How To Crack SSB" has created lot of success stories of the aspirants, and also the book's 3rd edition has been applauded with forewords from:

- Shri. Satpal Maharaj Ji - Ex-Chairman of Standing Committee of Defence & currently the Cabinet Tourism Minister Uttarakhand
- General(Dr.) V.K. Singh, PVSM, AVSM, YSM, ADC (Retd)
- Major General Dilawar Singh
- Lt, General Ghanshyam Singh Katoch, PVSM, AVSM, VSM (Retd)

Mr. Ujjwal Chugh owe all his success to his mentors & Gurus. Right from the inception of a Technology Company from his college days and as a mentor to aspirants, working professionals, business owners & student, whatever he could achieve in his Entrepreneurial career is all because of one of his mentors Indian Armed Forces (precisely SSB) . His formula being simple to practically implement and integrate the learning in everything you do with consistency and action-oriented approach.

Currently, the Founder & CEO of ISOLS Group - A leading Technology & Digital Firm which houses young and creative minds. The launch of very first Digital Marketing Dictionary in the whole world authored by him & launched at World Book Fair, was another bold step he took towards digitisation.

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Hundreds of Institutions have invited him to enlighten the students, entrepreneurs, professionals, . He is the master key behind the less ordinary lives of many and he himself continues to give a platform to the pool of talent and support lot of aspirants, entrepreneurs, start-ups, brands, professionals etc for their life & career success. He has been an influential speaker at various public forums and meets like TEDx, etc.

Besides the massive love and support he has been recognised by lot many influential personalities and have lots of accolades to his credit.

- Dr. Kiran Bedi presented a Token of Appreciation for Outstanding Contribution (Best Speaker) at the Annual Entrepreneurship Summit.
- National Gaurav Award at Vigyan Bhawan by the Minister of State for Parliamentary Affairs- Muktar Abbas Naqvi, for igniting the spark of Entrepreneurship & Digital Marketing within the youth of India.
- Shaheed Bhagat Singh Bravery Award for excellence as an outstanding young Entrepreneur & Digital Visionary for bringing the positive renovations in the sphere of digital education and channeling the youth for doing great work for their motherland India. Award presentation by renowned Bollywood star Shri Raza Murad Ji.
- Awarded “Real Sanwad Excellence Award” ‘as an outstanding speaker’ award presented by Ex MP of Canada.
- Many More...

Being in the space throughout his early age, the passion and dedication of Mr. Chugh in creating true leadership has been incredible. He adores to share his real time experiences with strong integrity. Driven by the law of nature, his messages are simple, powerful, practical, enlightening and life changing.

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**A STUDY OF WILLINGNESS OF CONSUMERS TOWARDS CONSUMPTION OF RESTAURANT FOOD DURING AND POST COVID-19 PANDEMIC**

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**<sup>1</sup>Ms. Swarupa Bhatia and <sup>2</sup>Dr. Parag Ajagaonkar**<sup>1</sup>Assistant Professor, BMS Department, Mithibai College of Arts, Chauhan College of Science & Amrutben Jivanlal College of Commerce & Economics, Vile Parle West<sup>2</sup>Principal, Narsee Monjee College of Commerce & Economics, Vile Parle West

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**ABSTRACT**

*The COVID-19 pandemic hit the world in 2019-20 impacting most of the countries including India and their economy. In India, one of the worst affected cities by the virus was Mumbai. Lockdown between March and October 2020 meant that restaurants remained closed for dine in business. Many smaller restaurants that could not sustain solely on food delivery model of business closed down while many others struggled to thrive. Post October 2020, while the restrictions on restaurants were considerable lifted, it is yet to translate into revival of the food industry. Concerns about safety of restaurant food, unwillingness of patrons to dine in at restaurants and failure of restaurants to follow SOPs as stringently since October 2020 are responsible for low revenues of the restaurants. The paper attempts to offer specific solutions and suggest changes in business models to restaurant businesses to thrive and flourish amidst the pandemic as Mumbai reels under the second wave of the virus as cases are rising rapidly in Mumbai.*

*Keywords: Fast food restaurants, coronavirus, COVID-19*

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**1. INTRODUCTION**

While the whole world was affected by the COVID-19 pandemic around 2019-20, many countries including India were forced to announce a lockdown to restrict movement and contact among citizens and thus control the spread of the virus. During the lockdown, only essential services were made available. Schools, offices, public places were completely shut down. The Indian hospitality sector was one of the worst hit sectors with restaurants being closed for dining in services. A few restaurants in Mumbai opened businesses during the lockdown but only for home delivery of food and had to follow strict protocol on cleanliness and hygiene during preparation and delivery. From March to October 2020, dining in facilities were completely closed. The lockdown was lifted in a phased manner and on October 5, 2020, restaurants could open at 50% capacity for dine in guests. Standard Operating Procedures (SOPs) were issued along with restrictions on timings for keeping the restaurants open. Many restaurants had to close permanently, as they could not sustain the losses, while paying high rents and salary to their staff with exceptionally low or zero revenue. Fast food restaurants operated majorly on delivery models to survive. With second wave of the virus hitting the country, it is to be seen if Mumbai residents are willing to dine at a restaurant in the current scenario. Consumers are getting impatient of restricting their movement and staying at home but eating out continues to be an unsafe activity. The sentiment of Mumbai residents is mixed as far as consuming restaurant food is concerned and this paper attempts to study the inclination towards consumption of restaurant food – whether it is dining out or ordering food. The willingness of people to consume restaurant food or return to restaurants needs to be studied. Additionally, the factors which can induce businesses to revive amidst the pandemic need to be studied, be it popularity or brand name of the restaurant that could give them confidence or certain restaurant formats that may be perceived as safer than others.

**2. LITERATURE REVIEW:**

“PM's address to the nation updates” (2020) on March 24 reported the announcement of ‘Janta Curfew’ by Prime Minister Narendra Modi, which would be a 21-day lockdown by starting from March 25, 2020. It aimed to restrict movement of people by closing all non-essential businesses and services including restaurants in this period.

“Unlock 1.0 Rules In Maharashtra” (2020) reported on June 8, the rules of the 1<sup>st</sup> phase of unlock rules for the state of Maharashtra. The article notes that malls and restaurants in and outside malls would continue to remain closed along with hotels and bars.

“With Unlock 1.0's social distancing” (2020) throws light on how government guidelines of ‘Unlock 1.0’ pose a struggle for small restaurants to reopen in its news article on June 13. The article focusses on how the challenge is bigger for standalone eateries rather than chain of branded restaurants. The changed curfew timing which does not allow restaurants to serve dinner, restriction of alcohol sales, rent costs and reduced staff may contribute to closing down of such restaurants.

Tanwar (2020) notes that in April many online aggregators started an alliance with consumer goods firms and large-scale retailers to stay afloat as very few restaurants were offering takeaway and home delivery services when lockdown was announced in Mumbai. These aggregators included Zomato, Swiggy, Dominos and Uber India.

Ail (2020) writes that few restaurants including the 5-star ones started home delivery of food in April 2020 by partnering with delivery apps like Scootsy, Swiggy and Zomato

Paljor (2020) observes that some restaurants started home delivery of food as early as April 5, 2020. Restaurants needed to follow certain precautions while doing home delivery of food. In food home delivery model, there are four aspects that needed to be taken into consideration. The actual food, the human resource handling the food – cooking as well as packaging and delivery personnel, the infrastructure of the restaurant and protection used during the delivery process. Restaurants used two-layer packaging, included disposable cutlery with food, accepted online payments online and ensured that delivery personnel wore masks and gloves. In addition, delivery happened with no contact, the food package being delivered outside the doorstep.

“Maharashtra govt releases Unlock 5.0 guidelines” (2020) on October 1, gives information through its news, on guidelines for ‘Unlock 5.0’ This set of unlock guidelines allowed restaurants to reopen on 5<sup>th</sup> October 2020, for the first time since lockdown was imposed in March 2020. The conditions to fulfil on reopening include following of SOPs for dine in facility. The restaurants would operate at a maximum of 50% of its total capacity.

Buch (2020) in an October news article mentions the Standard Operating Procedures (SOP) that restaurants had to follow if they restarted dine in services. An attendant to open the gate, availability of hand sanitisers at entrance and at tables, staff using protective gear, entry only to guests wearing protective gear, disposable menus, sanitised crockery were a part of the SOP for restaurants in Mumbai.

Ishwar (2020) notes that a Zomato report indicates that 40% of restaurants with dine in services may close down permanently. Around mid-August of 2020, only 17% were in business and 43% were expected to return to business after situation improved. The “Indian Restaurant Industry – Mid COVID-19 report” states that 60% of restaurant owners expected less than 50% of business in months following in post COVID-19 phase. Food delivery businesses are less affected with revenues being 75% to 80% of the pre COVID-19 phase revenues.

Maze et al. (2020), in an interview seeks opinion of fellow editors at Restaurant Business on if restaurant business will make a comeback in 2021. Peter Remeo believes that while takeaway business will continue to run successfully, people are seeking to experience dining in at a restaurant as and when allowed. Pat Cobe believes dining in experience is all about sharing food and experience with friends and Heather Lalley believes that while people are tired of cooking and eating at home, it is too early to go to a restaurant and feel comfortable around other patrons. Joe Guskowski agrees with Heather and adds that a few less cautious patrons might be the only ones visiting restaurants comfortably. While their opinions on how quickly the restaurant business will bounce back varies, they arrive at a consensus that dine in business will certainly make a comeback.

#### **4. METHODOLOGY OF STUDY:**

**4.1 Purpose of research:** This paper helps to understand the impact of lockdown due to COVID -19 pandemic on restaurants in India and attempts to predict revival of restaurant sector in Mumbai.

**4.2 Research design used:** This study uses exploratory method to see how willing the residents of Mumbai were to eating restaurant food during the pandemic. The study also attempts to predict if restaurants can return to their pre COVID-19 revenues in future.

**4.3 Population:** Residents of Mumbai

**4.4 Sample size:** A total of 100 respondents selected to collect data.

**4.5 Sampling method:** Simple random sampling

**4.6 Main study variable:** Frequency of consumption of restaurant food pre and post pandemic.

**4.7 Data collection methods:**

- Primary data was collected using questionnaire method employed for collecting primary data.
- Secondary data collected from online articles published in reputed notional newspapers and magazines.
- Statistical tools applied: Wilcoxon Signed Ranks Test

**4.8 Research limitations:** The study was conducted with a sample size of 100 respondents who are residents of Mumbai only.

**4.9 Practical implications:** The findings of the study will help restaurants in Mumbai know what their target market feels about consuming restaurant food- takeaway or dining in. It will also throw light on consumers' willingness to visit or order from certain formats of restaurants due to safety concern. The findings can be used by restaurants to predict future demand and get concrete suggestions on steps that they can take to improve faith that consumers have in eating out amidst the pandemic.

**5. RESULTS:**

**5.1** A total of 100 responses were taken as a part of the survey, of which 58 were females and 42 were males. At the time of study 6% of the respondents had tested COVID -19 positive in the past months/year.

**5.2 Frequency of visiting restaurant for dining in before the COVID -19 pandemic**

More than once a week	15
Once a week	28
Once or twice a month	32
Less than once a month	19
Did not visit restaurants before lockdown	6
Total	100

Before the pandemic, most of the respondents visited restaurants once or twice a month or more. Only 6% did not visit restaurants at all before March 2020.

**5.3 Frequency of takeaway or ordering food from restaurant before the COVID -19 pandemic**

More than once a week	22
Once a week	23
Once or twice a month	36
Less than once a month	6
Did not take-away or order from restaurants before lockdown	13
Total	100

Before the pandemic, most of the respondents ordered or got a takeaway from restaurants once or twice a month or more. Only 13% did not order or takeaway restaurant food at all before March 2020.

**5.4 Frequency of ordering food from restaurants during the Covid-19 pandemic between March and October 2020**

More than once a week	2
Once a week	3
Once or twice a month	22
Less than once a month	22
Did not order from restaurants between March and October 2020	51
Total	100

During the lockdown when restaurants were not allowed to have dine in customers, the businesses survived only on home delivery orders. 95% of the respondents ordered food once or twice a month or less

**5.5 Frequency of visiting restaurant for dining in since October 2020**

More than once a week	2
Once a week	5
Once or twice a month	32
Less than once a month	28
Did not order from restaurants since October 2020	33
Total	100

When dine in at restaurants was allowed from October 5, respondents still show reluctance to dine in. 93% of them visited a restaurant once or twice a month or less since October.

5.6 No. of respondents who:

feel safer to order food at home	52
feel safer to visit restaurants for a dine in experience	4
feel equally safe to dine in a restaurant or order from one	19
feel equally unsafe to dine in a restaurant or order from one	25
Total	100

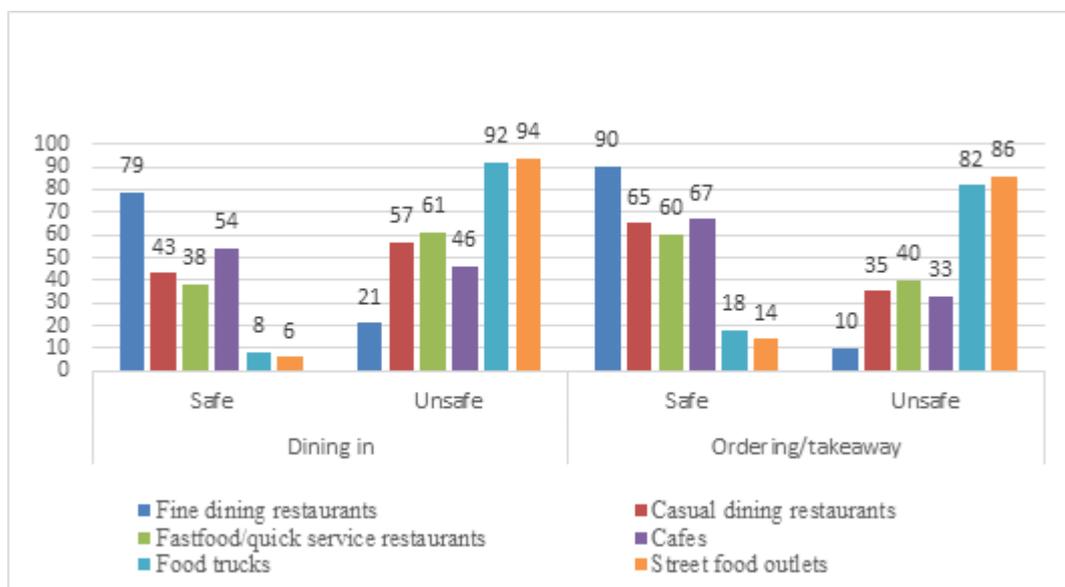
More than half of the respondents feel it is safest to order restaurant food at home and 25% believe that dining in or ordering from restaurants is equally unsafe from COVID -19 perspective.

5.7 Majority of the respondents i.e., 74% preferred ordering cooked food rather than uncooked food from restaurants

5.8 More than half i.e., 54% respondents admitted to reheating the restaurant food at home, before consumption, due to safety concerns.

5.9 81% respondents agreed to being more comfortable ordering from well-known restaurants than lesser known or unknown ones.

5.10 Perception of respondents towards dining at or ordering from different restaurant formats



For both dining in and ordering options, majority of the respondents feel it is safe to opt for fine dine and casual dine restaurants. While food trucks and street food outlets were considered most unsafe by majority for dining in, more respondents were comfortable ordering from these formats instead. Respondents also preferred ordering from fast food restaurants (60%) than dining in (38%)

5.11 Total of 64% respondents admitted to getting habituated to home cooked food during lockdown and will eat restaurant food less frequently in future while 32% felt that their eating habits would remain unchanged post pandemic. Only 4% felt that they would eat out more frequently in future, than before the pandemic.

5.12 Of 100 respondents, 59% were satisfied with precautions taken by restaurants since March 2020 towards the safety of dine in and delivery customers against 41% who felt that the initial precaution measures.

6. FINDINGS:

**Objective 1:** To compare if there is a significant difference is ordering food before and during the COVID-19 lockdown.

Since the data collected was non-parametric and ordinal in nature the Wilcoxon Signed Ranks Test was conducted to compare the frequency of ordering food before the COVID-19 Lockdown and during the lockdown after food delivery was permitted.

The following hypothesis were drawn to test –

Ho: There was no significant change in the frequency of ordering food before the COVID-19 Lockdown and during the lockdown after food delivery was permitted.

Ha: There was a significant change in the frequency of ordering food before the COVID-19 Lockdown and during the lockdown after food delivery was permitted

**SPSS output**

Ranks				
		N	Mean Rank	Sum of Ranks
During Covid Order - Before Covid Order	Negative Ranks	78 <sup>a</sup>	41.69	3252.00
	Positive Ranks	3 <sup>b</sup>	23.00	69.00
	Ties	19 <sup>c</sup>		
	Total	100		
a. During Covid Order < Before Covid Order				
b. During Covid Order > Before Covid Order				
c. During Covid Order = Before Covid Order				

Test Statistics <sup>a</sup>	
	During Covid Order - Before Covid Order
Z	-7.628 <sup>b</sup>
Asymp. Sig. (2-tailed)	.000
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

**Result**

There was a significant change in the frequency of ordering food before the COVID-19 Lockdown and during the lockdown after food delivery was permitted,  $p=.000 < 0.05$ .

A higher Negative Rank of 78 meant that the respondents ordered more food before the Lockdown and were cautious of ordering food during the lockdown.

**Hence, we reject the null hypothesis.**

**Objective 2:** To compare if there is a significant difference in dining-in before and after the COVID-19 Lockdown (After physical dining in was permitted in Mumbai)

Since the data collected was non-parametric and ordinal in nature the Wilcoxon Signed Ranks Test was conducted to compare the frequency of dining-in before and after the COVID-19 Lockdown (After physical dining in was permitted in Mumbai)

**The following hypothesis were drawn to test –**

Ho: There was no significant change in the frequency of dining-in before and after the COVID-19 lockdown (After physical dining in was permitted in Mumbai)

Ha: There was a significant change in the frequency of dining-in before and after the COVID-19 lockdown (After physical dining in was permitted in Mumbai)

**SPSS output**

Ranks				
		N	Mean Rank	Sum of Ranks
After opening Dine in - Before Covid Dine In	Negative Ranks	69 <sup>a</sup>	36.88	2544.50
	Positive Ranks	4 <sup>b</sup>	39.13	156.50
	Ties	27 <sup>c</sup>		
	Total	100		
a. After opening Dine in < Before Covid Dine In				
b. After opening Dine in > Before Covid Dine In				
c. After opening Dine in = Before Covid Dine In				

Test Statistics <sup>a</sup>	
	After opening Dine in - Before Covid Dine In
Z	-6.700 <sup>b</sup>
Asymp. Sig. (2-tailed)	.000
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

**Result**

There was a significant change in the frequency of Dining-in before and after the COVID-19 Lockdown (After physical dining in was permitted in Mumbai),  $p=.000 < 0.05$ .

A higher Negative Rank of 69 meant that the respondents visited restaurants more before the Lockdown and were cautious of visiting restaurant even after restaurants were permitted Dine-in

**Hence, we reject the null hypothesis.**

**Coding:** the responses were coded as follows –

0	I did not order food from restaurants before lockdown / I did not order restaurant food at all / I have not dined in a restaurant since they opened in October 2020 / I did not visit restaurants before lockdown
1	Less than once a month
2	Once or twice a month
3	Once a week
4	More than once a week

**7. RECOMMENDATIONS**

The restaurants have not been able to regain faith of its patrons, whether it is for takeaway or ordering during lockdown and post unlock 5.0 or for dining in since restrictions were eased. With beginning of the second wave of Covid-19 amidst rising cases in Mumbai, there is a possibility of another series of lockdowns and restrictions. The research helps to understand the sentiment of Mumbai residents as far as consumption of restaurant food is concerned and also predict their behaviour in future. Based on the results of the research, following are the recommendations for restaurant businesses:

1. Patrons are more comfortable in ordering food than dining in. Restaurants should have a more robust infrastructure for processing delivery orders.
2. Staff responsible for serving dine in customers could be temporarily utilised to serve takeaway or home delivery orders.
3. It is a popular perception that restaurants became complacent in weeks following Unlock 5.0. It is important that restaurants have tighter quality control norms in place which are supervised on continuous basis. Hiring staff on supervisory roles, ensuring staff and patrons wear masks, staff wears gloves, sanitation of tables between customer visits and operating at 50% capacity to ensure social distancing must be strictly followed.
4. An open kitchen or a kitchen that can be visually accessed by patrons from dining area can help restaurants maintain transparency in communicating hygiene maintained in the back end.
5. A revamped menu with only cooked food can be created as patrons perceive uncooked food like juices and salads to be unsafe.
6. Creative promotional schemes could be implemented where patrons coming in groups of 6 or less, following all safety protocols during their restaurant visit could be incentivised with a discount on total bill amount. This will not only ensure increase in walk-in customers who also follow the safety norms but will also benefit the brand as a socially responsible one.
7. While the focus on home delivery orders stays, it is important to beat competition as many cloud kitchens have started operating in 2020. Quicker delivery, more variety in menu, heavier discounts on delivery orders, a program to incentivise frequent customers must be on priority.
8. This pandemic could be looked at as an opportunity to create new format of restaurants where the floor plan could be made in a way that gives dedicated and enclosed spaces to each group of patrons that visit, like cabins, allowing them to experience dining in and socialise without the fear of contracting the virus.

## 8. CONCLUSION

While many smaller restaurants closed during the pandemic due to cash crunch, there has been an increase in competition among the ones that survived. Restaurants which were seeing a slow but steady rise in its footfall and orders in recent weeks are once again facing the same challenges that they faced in March 2020, due to rising COVID -19 figures in the country, especially in Mumbai. There is need for more long-term changes that the restaurants can bring about in their business model, focusing on delivery orders more than dine in customers. Maintaining hygiene in food business continues to stay non-negotiable if restaurants want to gain faith of their target market.

## 9. SCOPE FOR FURTHER STUDY

Further research can be done to see why certain formats of restaurants are perceived to be safer during the pandemic and recommend changes in businesses for those considered to be unsafe. Research can also be done to study consumer behaviour in the post vaccination period, since latest information shows that efficacy of the vaccine is 60% to 80% and not 100%.

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**PERCEPTION OF COMMERCE STUDENTS TOWARDS ONLINE LEARNING IN MUMBAI**

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**Tanvi Khandhar**Department of Management Studies, D.G. Ruparel College of Arts, Science, Commerce, Mumbai, India

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**ABSTRACT**

*Education and learning has been affected worldwide due to the Covid-19 pandemic. A shift towards online learning has been seen since early 2019 due the Covid-19 pandemic situation across the world. Most institutions are now operating through online mode as the usual offline face-to face learning is neither suitable nor possible. However the shift to switch to online learning has not been easy for the students. With this, it is relevant to know the perception and awareness of students towards online learning. For this study, responses from 154 students of Commerce stream based in Mumbai region are collected through an online questionnaire. The research was conducted in the month of March 2021. The findings of the study have revealed a positive and accepting perception of students towards online learning. Students also have faced difficulties in concentrating during online class, and understanding the practical subjects like Accountancy, Finance, and Mathematics. The findings of this study may be used by colleges and policymakers to improve the online learning experience for students.*

**Keywords:** *Students Perception, Online Learning, Online Class*

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**1. INTRODUCTION**

Online learning has gained momentum as educational institutes across the world are now closed due to Covid-19 pandemic. Most of the institutes have switched towards online learning platforms such as Google Classroom, Zoom, and Microsoft Teams. The sudden shift with very little preparation makes it difficult for teachers and students alike to adapt to online learning.

Necessity is the mother of invention. And within the context of a global pandemic, necessity was the mother of wholesale transformation. The monumental challenges educators overcame in 2020 is astounding. From preschool to grad school, the race to adopt and adapt online learning platforms hit a pace and scale previously unimagined (Lombardi, 2021). Starting 2020, Indian universities and colleges, which were earlier not permitted to offer more than 20 percent of a degree online, are now lifting the restrictions on online learning to widen access to higher education and raise the profile of Indian institutions globally (Gupta, 2021). Online education has provided a new way of learning to develop a student's mindset beyond schooling education. More than 370 million users are on the internet in India helping online education to grow at a fast pace (Aurora, 2017). In a physical classroom, setting interaction is more dynamic and course instructors can stimulate feedback from students more easily but with online classes, teachers need to find more creative ways to make the conversation interesting (Jahangeer, 2021). The utilization of more digital resources in all the processes of the student value chain, apart from teaching learning such as admissions, examinations, assessments, internships and placements will be in high demand. There will be more opportunities for internships in the virtual domain breaking all geographical barriers for both the student interns and organizations (Chaturvedi, 2021). The government and educational institutions have done an admirable job of "keeping things going." There is a general agreement that Covid-induced online education emerged out of necessity and at best can be a stop-gap arrangement. However, standing in the cauldron, we can realize some positive impacts from the current extenuating circumstances. Dark clouds have a silver lining (Rajan, 2021).

With this context, it is critical to understand the views of online learners towards adoption of online learning. This study tries to understand the perceptions and awareness of Commerce students towards online learning.

**2. OBJECTIVE OF THE STUDY:**

1. To understand the perception of Commerce students towards online learning
2. To understand the impact of online learning on Commerce students
3. To understand the awareness and involvement of Commerce students towards online learning
4. To understand the opinion of Commerce students towards the future of online learning

**3. LITERATURE REVIEW:**

The skills enhancement and development program for educators and learners to use the technology in education is an important factor for the success of e-learning. The technical support most demanded by the participants at all levels in the current study concerned how to use online tools in education and time management (Linjawi &

Alfadda, 2018). One of the challenges of online learning relates to students feeling disconnected to their classmates and instructor (Gray & DiLoreto, 2016). Prior experience may not have been found to be a contributor to student satisfaction as online environments may no longer be such a challenge for students to learn (Santos, Inan & Denton, 2012). Most students simply did not feel that the amount of time it took to complete the modules was worth what was gained (Smart, 2006). effective use of technology requires instructors to be skilled in its usage toward synthesizing meaningful interactions, mindful participation and instructional explanation (Chen, Landa, Padilla, & Yur-Austin, 2021). The online method of learning is best suited for everyone. Depending on their availability and comfort, many people choose to learn at a convenient time. This enables the learner to access updated content whenever they want it. (Radha, Mahalakshmi, Kumar, & Saravanakumar, 2020). Once the COVID-19 pandemic ends and educational institutions re-open, the concerned authorities should continue to invest in online education to enhance learning experience. They should carefully analyze the issues experienced during sudden transition to online learning and prepare for any future situations (Chaturvedi, Vishwakarma & Singh, 2021) students' time spent online is directly proportional to the instructor's online time, promptness of instructor's response to online activities queries of students increased student engagement, the students' engagement increases if the online content is related to the syllabus but engagement is not the same as the face-to-face lectures in the class (Dwivedi, Dwivedi, Bobek, Simona, & Zabukovšek, 2019). Resistance to change, lack of experience, and privacy are among challenges hindering instructor engagement in digital products and services of Higher Education Institutes. In addition to different types of challenges, Higher Education Institutes plans and strategies should consider all the non-technical challenges related to stakeholders' attitudes, including all cognitive, behavioral, and affective challenges to assure the successful adoption of Digital Transformation in Higher Education Institutes (Ahulbaishy & Aljuhani, 2021). Malaysian postgraduate students have moderate academic performance, even though they could adapt to the new norms of online learning. Secondly, a majority of the students are facing financial stress brought about by the uncertain economic conditions in Malaysia during this outbreak. Thirdly, our findings also show that good academic performance increases financial stress among postgraduate students yet reduces social interaction. This shows that Malaysian postgraduate students are facing challenges in completing their studies during the outbreak (Nasir, Ramli, & Som, 2020). Students' main aspirations are related to the employment of an effective online learning environment with integrated technologies for providing online communication between participants, online assignment submission and online support by the teacher (Forsyth, Yovkova & Aleksieva, 2018).

#### **4. RESEACH GAP:**

The review of literature reveals that most of the studies are undertaken to identify students' perception and attitude towards online learning. However a gap is seen when it comes to understanding the perception of Commerce students towards online learning.

#### **5. RESEARCH METHODOLOGY:**

This study was carried out to specifically understand the perception of Commerce students in Mumbai region. In this study a descriptive questionnaire was used as an instrument to obtain the primary data using Google Form link. The respondents of this study were students who are pursuing online education in Mumbai. The respondents are a mix of those studying and higher secondary (11<sup>th</sup> and 12<sup>th</sup> grade), Undergraduate, and Postgraduate level. The responses from 154 online learners are collected.

A Five-point Likert scale, and close ended type questions were used to collect the opinion of students in the online class. The Five-point Likert scale indicated with one being strongly disagreed, two being somewhat disagree, three being neither agree nor disagree, four being somewhat agree, and five being strongly agreed. Various sources like, websites, journals, articles, reports are used as secondary data for this study.

The data collected was then categorised and analysed to study the perception of Commerce students. Further, numerical techniques were used to analyse the data and interpret the perception of Commerce students towards online learning.

#### **6. RESULT AND FINDINGS:**

The demographic profile of students was collected to know their background like gender and education. Table 1 shows the demographic profile of students. It indicates the 58.4% of the total respondents were females. And 41.6% of the total respondents were males. It also shows that 14.3% of respondents are in higher secondary or pre-university (11th and 12th grade), 70.1% are in undergraduate courses, and 15.6% respondents are in postgraduate courses.

The perception of Commerce students towards online learning- listed in Table 2, The impact of online learning- listed in Table 3, the awareness of online learners during online learning- listed in Table 4, and teachers' support to improve the online learning experience- listed in Table 5 was collected by asking the opinion of students on various aspects online learning using five-point Likert Scale-based statements ranging from Strongly Agree to Strongly Disagree. The findings of this research are grouped into two aspects- positive experience and negative experience. Further, Strongly Agree and Somewhat Agree are combined together to form one positive response of 'Agree'. Similarly, Somewhat Disagree and Strongly Disagree are combined to get one response of 'Disagree'. And Neutral was left as it is.

- **Positive Experience:** It is seen that 66% of the respondents understand all the concepts taught in online classes. However, only 28.57% of respondents agreed to understand the concepts faster in online class as compared to face-to-face physical classes. 34.42% have agreed that online learning has brought a positive change in their studies. A massive 83.12% agreed that their technical knowledge has increased due to online learning. Similarly, the students who agreed to have received more time to pursue extra-curricular activities due to online learning are a colossal 84.41%. The flexibility and ease in online learning is yet another experience that 87.01% students have agreed with. A whopping 92.2% of students have received online study material from teachers during online learning. Students also need to be encouraged to participate and discuss in online classes. And a gigantic 91.55% of students agreed to receive such support from their teachers. Further, in order to make online learning experience a better one, 81.81% students also had support from teachers after online class to solve their doubts, as per this study.
- **Negative Experience:** Difficulty to concentrate is one of the major concerns in online learning. And as per this study, 70.78% agreed to face such difficulties. In addition to that, understanding practical subjects like Accountancy, Finance, and Mathematics was also a concern faced by many Commerce students. 70.78% of students have faced such difficulties. Similarly, 72.08% respondents were worried about their mic and camera during online class. Online learning has also led to increased stress for 58.44% of students. Similarly, students 88.96% have also agreed that online learning has led to an increased screen time. A 60.41% agreed to feel social isolation due to online learning.

When it comes to online learning, the involvement and awareness of students is very important. Through this study it was found that 87.17% of the students were aware of their timetable for the online classes. Additionally, 87.67% of the respondents were also aware of who was their subject teacher. Not only that, 75.34% of the respondents also agreed to know what portion was covered in online class. 79.22% agreed to be aware of all assignments and tests assigned to them during online learning and 77.92% agreed to be aware of the due date of such assignments and tests assigned during online learning. 88.96% of respondents were aware of the time table for online semester exam.

58.33% of Post-Graduation students, 51.85% of Under Graduation students whereas 50% of Higher Secondary students believe that online learning enable them to get high quality education with relevant skills (Fig. 1). 54.54% of Higher Secondary students and 58.33% of Post-Graduation students would prefer online learning after going back to complete normalcy, whereas only 37.03% of the Under Graduation students opined for the same (Fig. 2).

## 7. CONCLUSION

This study aimed to analyse the perception of Commerce students towards online learning. Online learning has given both positive and negative experiences to students. However, the positive experiences are more with Commerce students. The study indicates that online learning enables flexibility to students in learning. Online learning is found to be advantageous as it gives students more time to pursue extracurricular activities. Unlike the past study conducted by PS and Subramanian (2019), most students reported facing difficulties in understanding topics of Accountancy, Finance, and Mathematics during online learning. The study also revealed that online learning has caused more stress to students and has led to increased screen time and some amount of social isolation. Hence, these factors must be considered while improving the online learning experience for students. Online learning must be made engaging in order to deliver a classroom like experience to students. The study affirms high levels of involvement of students in online learning. Online learning has enabled students to be mindful of the timetable, portion taught, tests and assignments assigned to them. The involvement of teachers to make online learning effective has also been high. Further, the participants of this study indicated that online learning enables them to get high quality education with relevant skills.

8. TABLES AND FIGURES:

TABLE 1: DEMOGRAPHIC PROFILE

VARIABLES	CATEGORY	NUMBER	PERCENTAGE
Gender	Male	90	58.4
	Female	64	41.6
Education	Junior College	22	14.3
	Under Graduate	108	70.1
	Post-Graduation	24	15.6

TABLE 2: PERCEPTION OF STUDENTS (N=154)

ITEMS	STRONGLY AGREE	SOMWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	STRONGLY DISAGREE
I am able to understand all the concepts taught in online classes	16%	50%	12.33%	13.64%	7.79%
I understand concepts in online class faster than offline face-to-face class	7.79%	20.78%	22.73%	22.73%	25.97%
I feel online learning has brought a positive change on studies	11.69%	22.73%	29.87%	21.43%	14.28%
I face difficulty in concentrating in online class	37.66%	33.12%	12.99%	9.74%	6.49%
I face difficulty in understanding concepts of practical subjects like Accounts, Finance, Mathematics	39.61%	24.67%	13.64%	12.99%	9.09%
I am worried about my mic and camera during online class	42.21%	29.87%	11.04%	7.79%	9.09%

TABLE 3: IMPACT ON STUDENTS (N=154)

ITEMS	STRONGLY AGREE	SOMWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	STRONGLY DISAGREE
Online learning has increased my technological know-how	43.51%	39.61%	12.99%	3.25%	0.65%
Online learning has given me more time to pursue extra-circular activities	54.54%	29.87%	7.79%	5.19%	2.60%
Online learning has made it convenient and flexible to attend classes	55.84%	31.17%	8.44%	2.60%	1.95%
Online learning has led to more stress	28.57%	29.87%	22.08%	10.39%	9.09%
Online learning has led to more screen time	61.04%	27.92%	8.44%	1.30%	1.30%
Online learning has caused me social isolation	27.93%	32.48%	26.64%	7.15%	5.80%

TABLE 4: AWARENESS OF STUDENTS (N=154)

ITEMS	STRONGLY AGREE	SOMWHAT AGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT DISAGREE	STRONGLY DISAGREE
I am aware of the time table for my online classes	59.09%	27.27%	5.84%	5.19%	2.60%
I am aware of who is my subject teacher during online learning	69.48%	18.18%	5.19%	5.54%	2.60%
I am aware of what portion is covered by my teacher during online class	34.43%	40.91%	9.09%	9.09%	5.84%
I am aware of all assignments and tests assigned to me during online learning	48.05%	31.17%	8.44%	9.09%	3.25%
I am aware of the due date of all assignment and test assigned to me during online learning	46.75%	31.17%	9.74%	8.44%	3.90%
I am/was aware of the time table for my for online semester exam	69.48%	19.48%	8.44%	1.95%	0.65%

TABLE 5: TEACHERS' SUPPPORT TO STUDENTS (N=154)

ITEMS	STRONG LY AGREE	SOMWHA T AGREE	NEITHE R AGREE NOR DISAGR EE	SOMEWH AT DISAGRE E	STRONG LY DISAGRE E
My teacher shares study material for online learning	64.28%	27.92%	5.54%	2.59%	0.65%
My teacher encourages open discussion and participation during online class	66.23%	25.32%	3.90%	2.59%	1.95%
My teacher is available after online class to solve doubts	55.19%	26.62%	10.39%	2.59%	5.19%

FIG. 1- Online Learning enables to get high quality education with relevant skills

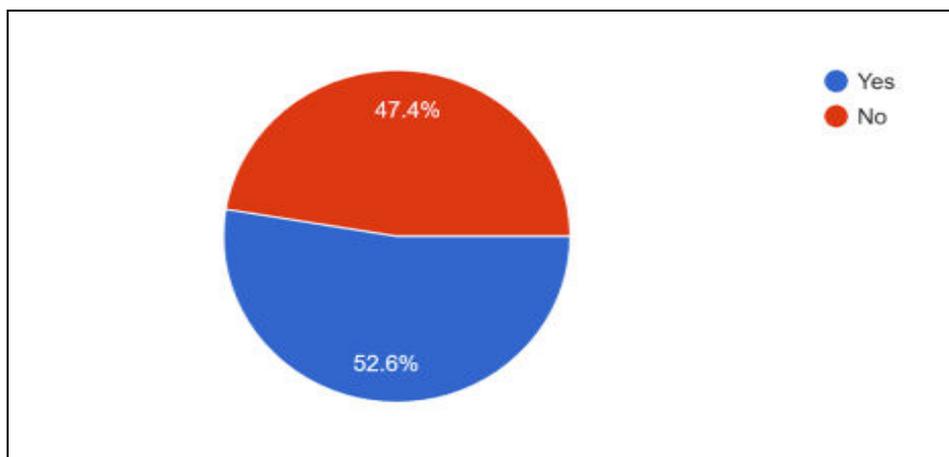
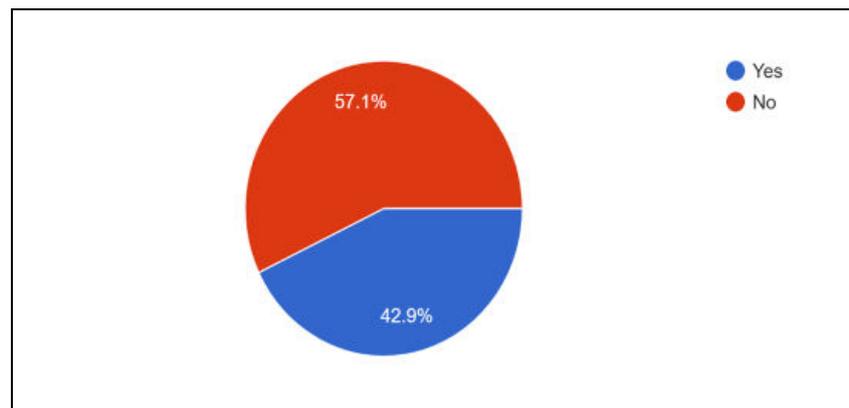


FIG. 2- Preference for online learning after going back to complete normalcy



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**FREEDOM OF SPEECH AND EXPRESSION AND LEGAL CHALLENGES AHEAD REGARDING REGULATIONS ON OTT PLATFORM**

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**Dr. Dimpal T Raval**Faculty of Law, School of Security, Law Enforcement and Criminal Justice, Rashtriya Raksha University (INI)

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**INTRODUCTION**

Freedom of expression is the fundamental basis of any functioning democracy. Regardless of anyone's cultural, religious, ethical, political or another background the very fundamental right should be enjoyed by everyone. In a democratic setting, everyone has the right to depict his or her expression on various topics. It in a way paves the way towards providing the right to think outside the box. Every one of us has the right to express ourselves, especially since we live in a nation with people from various social and economic backgrounds. It is true that the purpose of law is to protect the rights of individuals. But if there arise some irrational circumstances, it affects the right to freely speak and express. Such opportunity is provided to ensure that citizens retain the right to express themselves freely, except when it tends to affect the right of individual citizens or the nation for that matter.

It is evident that the Over-the-top (*hereinafter* OTT platform) have proliferated and expanded across entire industry. OTT platforms accelerate video content streaming over the internet. OTT platforms such as *Amazon, Hotstar, Netflix, Disney, Hulu* and others have largely replaced the traditional television facilities. Recently Government of India brings out the platforms under the purview of Information and Broadcasting ministry. It was on November 9, 2020 when the Cabinet Secretariat issued a notification and added aspects like films and "audio-visual programmes provided by online service providers, as well as news and current affairs". Such This initiation relates to the fact that the web contains a large amount of unrestricted content, as well as the lack of an adequate regulatory regime in place to protect its users. This very news has put forward a serious debate over the issue of freedom of speech and expression by way of OTT platform. Earlier to this notification there is a system of self-regulation of OTT platform content. Moreover, the Constitution of India safeguards the elements of freedom of speech and expression. The interpretation of both the articles states that conditions which are given under article 19 (2) only on the basis of which only freedom speech and expression can be restricted and not otherwise. There are 2 fold opinions about the OTT platform. One view is that OTT platform gives right to express content in artistic manner. Thus it is a way of exercising freedom of speech and expression and its regulation by the information and broadcasting ministry may hamper this right. On the other hand there is argument on the parts of the Information and Broadcasting Ministry that the prevalent free exercise of freedom of speech and expression by OTT platform sometime hampers the public decency, modernity and so on. It is itself a ground of restricting the freedom of speech and expression. Therefore regulation of OTT platform is very necessary at this time. Covid-19 has accelerated the speed of the use of this platform regularly by the viewers. People are now more interested in watching movies at this platform only to avoid going un-necessarily out. The viewers can be child, youngsters, adults etc. therefore content deliver on OTT platform could affect youth or childhood of individuals. Thus regulation of content delivery at this platform is very much necessary at this point of time. So far is the regulation of platform by the Information and Broadcasting Ministry is concerned it is not going to affect freedom of speech and expression of the individual. They will be allowed to express their opinion through movies, short films and so on. But ministry will be regulating the movies and the other programs in larger public interest.

**RESEARCH OBJECTIVE**

1. To understand the legal challenges faced in self-regulation of OTT Platform.
2. To analyse whether regulation of OTT platform by Ministry of Information and Broadcasting will have adverse effect over the fundamental right of individual given under Article 19 (1) (a) of the Constitution of India.
3. To know legal challenges if any before Ministry of Information and Broadcasting in regulation of OTT platform content.

**RESEARCH METHODOLOGY**

The researcher has adopted the Doctrinal Research Methodology to complete this research on the issue of regulation of OTT platform by the Ministry of Information and Broadcasting. Secondary sources like books, journal, reports etc. has been referred to gather required information and inculcation of the same.

**OTT Platform: Freedom of Speech vs. Regulation of it**

As given in the Constitution of India freedom of speech and expression is a fundamental right but it is not free from reasonable restrictions. Therefore it is claim of Ministry of Broadcasting that it will be regulate the content of products released on OTT platform on grounds which are given under article 19 (2) itself only. It is very necessary to regulate freedom of speech in a democratic society considering the aspect of national security, integrity and public safety for that matter. It is also pertinent to see that there lays protection of reputation and rights of others for preventing disclosure of information received in sense of confident behavior or for mentioning the authority and impartiality of judiciary.

During covid-19, OTT platform have flourished and captured the market in time. The subscribers of it are double of 2019. Also there is increase in screen time of the viewers by 300 % in August 2020. The channels like Disney plus release 60.5mm in August of 2020. Netflix had one 67mm subscribers the previous year and it show the global subscription search to almost 183 million in April 2020. According to PWC report now the total number of users of it is more than 193 billion by July 2020. Like movies are exhibited or released in theatres there is a need of certificate from the Central Board of film. Its content is regulated by the existing laws and regulations like “*Cinematographic Act 1952, Cable Television Networks Regulation Act 1955, and Cable Television Networks Rules 1994*”. On the other hand there is no specific regulation which regulates the content of OTT platforms at present. The Information Technology Act, 2000 (IT Act) is clearly stated in the code as the primary governing framework when it comes to online content. The internet and material on the internet are directed by the values enshrined in India's Constitution. This lack of laws is affecting the choice and mind-set of the viewers. This situation is stressing on formulation of laws and regulation for OTT platform. In regard and in accordance to the postulates of the Constitution, a specific policy for the digital content sector must be drafted considering the various restrictions that fall within the domain of constitutional restrictions outlined in Indian Constitution.

Technology is undoubtedly tool of growth and wellbeing of society but at the same time it has introduced real challenges for the individuals in the social order. Thus it is very necessary for the government to safeguard the rights of user to respond to these challenges by introducing new and robust mechanism. While framing the laws it is to be taken care that the laws which are to be introduced for the protection of the society will not jeopardize the rights of the users. Rather laws should be regulating the interest of society. Also there is difficulty regarding enforcement of laws. In addition to this biggest challenge in case of OTT platform is sovereignty. There is exchange of content across the boundaries and thus difficulty lies in regulating the content of foreign jurisdiction. Harmonization of laws regulating content of OTT platform at international level is thus another challenge. Also a proper check and balance system should be there in regulation of freedom of speech and expression of individual.

**Self-Regulation of OTT Platform vs. Regulation by Government**

It is indeed true that the element of freedom of speech and expression on social media, of opinion, positions of fact is specially an aspect of Indian Constitution. Further the freedom of creation and expression circumscribes within elements like culture, public life and the entire society at large and these aspects are regarded as freedom of speech and expressions and also enjoy special protection. These violations have to be resolved through regular legal processes utilizing the available remedies only.

The only alternative currently accessible to such platforms to maintain their capacity to transmit content without excessive control is self-regulation. Since arbitrary restrictions would limit OTT platforms' creative freedom, it will help platforms conduct themselves in a morally upstanding and equitable way while also defending the interests of their users. It would maintain an individual's right to free speech and expression while encouraging creativity, protecting the artistic independence of content creators. The common mass wants to see the material in its unaltered, unaltered state. They want to comprehend art in it's appropriate and basic form. A government agency's primary duty is to preserve a level playing field; it is not to stifle creativity and innovation by imposing restrictions on the IT sector.

Self-regulation of OTT platform by the industry itself face certain issues which are:

- a. What constitute self?
- b. Who is regulating it?
- c. What is the genesis of such regulations?
- d. What are the checks and balances inherited in the procedure?

- e. If the technocratic giants are of the view to choose the contours of free speech in line with company policies, then under such circumstances, how can the conflict of interest be handled?
- f. If the outcomes are not satisfactory, what would be the redressal mechanism?
- g. How transparency is being maintained?
- h. What mechanism is available for judicial, legal or executive for site of self-regulation?
- i. What is the aspect of accountability or liabilities on part of regulator in terms of breach of the terms of contract or any other private laws for that matter?

The self-regulation of OTT platform is the outcome of the order of Supreme Court of India. However the present order of the government does not specify anything about allocation of subject.

Moreover, in order to draught some standards for modifying the content available on OTT platforms; in October 2018, Justice for Rights Foundation consolidated public interest litigation (PIL) before the Hon'ble Delhi High court. In its counter affidavit, the MIB depicted that the digital platforms are not required to obtain a license in order to display their content and that they have no control over it. In addition to this, the Ministry of Electronics and Information Technology (MEITY) has also highlighted that there does not lie any aspect of regulating internet material and that there is no system in place to watch over or license a company or organization that publishes anything online.

However, it was asserted that the IT-related provisions are applicable and that the relevant legislative authority, which has jurisdiction under the aforementioned Act, is authorised to act using the authority provided to them that includes directives for data encryption, interception, and surveillance. Additionally, uploading or transmitting obscene content in any manner is also punishable. As a result, the court dismissed the petition and stated that it could not give a mandamus to create regulations since the IT Act already has strong limitations and because the aforementioned petition is still pending before the Hon. Supreme Court.

## CONCLUSION

It is right time to debate over the issue of regulation of OTT platform in the interest of general public at large. In light of the same, it is worth mentioning that-

*“The moderates guarded the Extremist chief Bal Gangadhar Rao Tilak right to speech and write what he loved. Further the Karachi Convention of the Congress in 1931, passed a goal on Fundamental Rights which inter alia, ensures right of free expression of opinion through speech and press.”*

Evidently, such explicit and unique history advocated the aspect of freedom of speech and expression that has been tuned as a prominent right in the Constitution. But Freedom of Speech and Express does not amount to encroachment of other's fundamental Rights. It has certain restrictions as it does not provide absolute rights. It has to in line with the social order, the moral values and the legacy of the social context. India is a country which has its own written constitution, while providing enormous liberties, also imposes reasonable restrictions. Thus curbing content for maintaining public harmony, protecting individuals' feelings can be termed as fundamentally wrong. It may send a negative connotation to people in general due to erroneous understanding. It is rather appropriate that the real time viewers watch it and form their own opinions and built their opinions as well.

Further, regulation of it is important in a way that is best serve the individual right to freedom of speech and expression with reasonability. The law to be formulated should not be biased and arbitrary. A harmonious approach on the part of makers of laws is very important in this regard. Thus regulation is indeed necessary in the interest of nation. Self-regulation of OTT platforms completely justifies the quote *“Absolute Power Corrupts Absolutely”*.

Only when restrictions are necessary to prevent serious harm from being committed may speech and expression rights are restricted. In order to assert a thriving and effective democracy, it is vital to possess a freedom of expression that is healthy in nature. If not, democracy is archaic and equivalent to a totalitarian dictatorship. What the general audience wants to watch and what they don't should be left up to them. Thus, a sustainable self-governance paradigm serves as the basis for preserving artistic freedom.

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IMPACT OF LOCKDOWN DUE TO COVID 19 PANDEMIC ON AIR QUALITY IN INDIA

Pooja Sawant

Assistant Professor, Department of Environmental Studies, Smt. M.M.K. College of Commerce and Economics, Bandra (West), Mumbai, Maharashtra, India

ABSTRACT

The sudden outbreak of the COVID 19 pandemic resulted in a complete lockdown on 24<sup>th</sup> March 2020 in India. The transportation facilities came to a standstill, the industries were closed and people were asked to remain at home. Burning of fossil fuel is the major contributor of air pollutants. During the lockdown period the coal consumption decreased leading to reduction in the emissions thus reducing air pollution. This study explored through the literature and reports, the positive impact on air due to the pandemic as there was a halt on major polluting sectors like industries, transportation and various economic activities led to improvement in air.

**Keywords:** Pandemic, industries, Lockdown, economic activities

INTRODUCTION

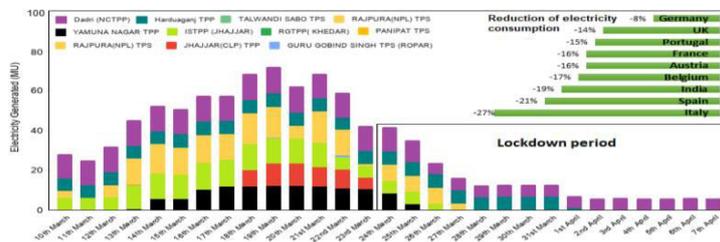
There was a sudden outbreak of the SARS coronavirus disease in late December 2019 in Wuhan China. The SARS CoV-2 (SARS related coronavirus) infection spread rapidly through person-person contact or contracting through the droplets produced from coughing, sneezing, talking with the infected person. An international public health emergency was declared by World Health Organization (WHO, 2020) as the covid related death cases were increasing. In India on 24<sup>th</sup> March, 2020 a complete lockdown was declared for 21 days as the infection was spreading rapidly and reported 563 cases (Pulla 2020). The offices were closed down and people were asked to work from home. Even the educational institutions were closed, the transportation services including the international flights were suspended which ensured people remain at home to control the virus spread and reduce the mortality due to COVID-19. Only the essential services (Food, fire, police, medicine) were functioning rest there was a complete standstill.

The lockdown which was extended further ceasing the government and non-government offices, eateries and work from home conditions had reduced tremendous traffic on the road reducing the GHGs emissions. Along with it the non-essential service providing industrial activities even were ceased which further reduced the emission of the smoke. This led to an alteration in the Air Quality.

This article is the study of the changes in the air quality during the lockdown.

Positive environmental impact

The closure of industries, suspension of transport led to a decrease in the greenhouse gases (GHGs) emissions. India ranks second in coal consumption, during the lockdown period its coal consumption decreased by 26% and 19 % decrease in average daily reduction in power generation observed two weeks after 24<sup>th</sup> March,2020. (CREA, 2020)

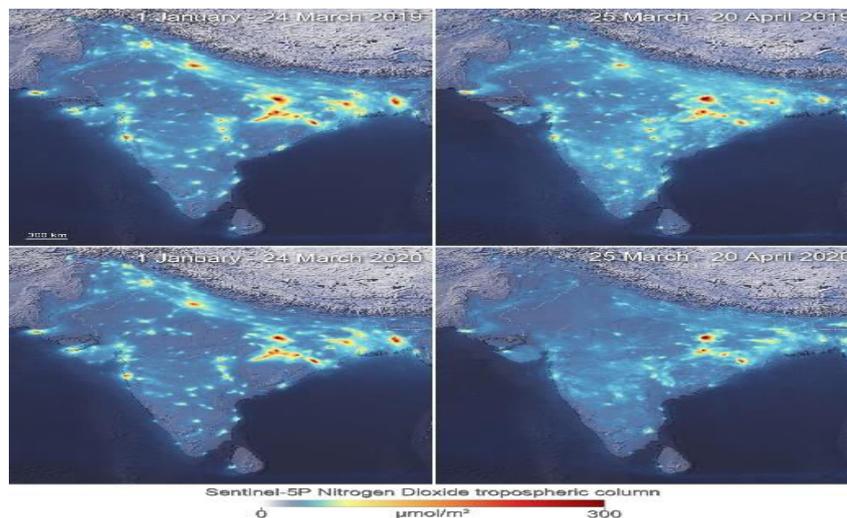


In India total coal based electricity generation before and after lockdown and its reduction of electricity consumption (Data sources: Armstrong, 2020; CREA, 2020; Heliyon, 2021)

	Coal	Lignite	Hydro	Nuclear	Gas, Naptha & Diesel	REA (Wind, Solar, Biomass & Others)	Total
Power generation (MU) between 11th March 2020 - 24th March 2020	34623	1174	4281	1667	1903	4535	48175
Power generation (MU) between 14th March 2020 - 7th April 2020	25485	1086	4397	1631	1976	4268	38843
% Change	-26%	-7%	3%	-2%	4%	-6%	-19%

Source CREA, 2020

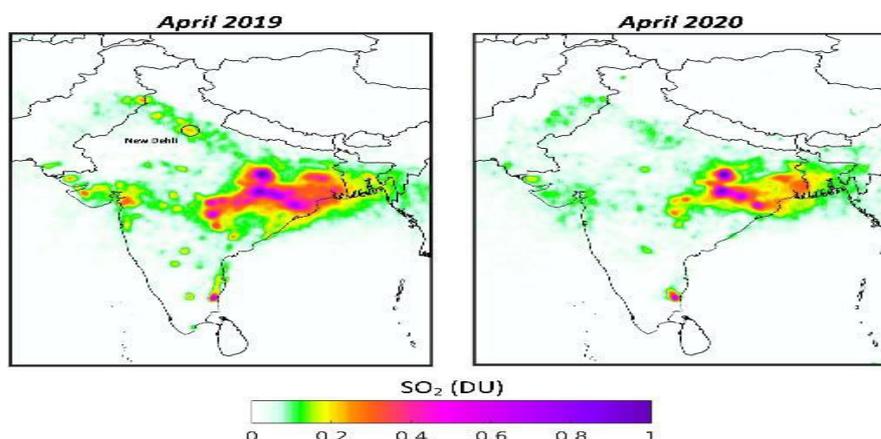
Fossil fuel combustion is the major contributor of air pollutants like CO, SO<sub>2</sub>, NO<sub>2</sub>. The Central Pollution Control Board operates NAMP (National Air Monitoring Programme) for India, with State Pollution Control Boards giving AQI through 8 parameters i.e (CO, SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, O<sub>3</sub>, NH<sub>4</sub>, Pb). These are the major air pollutants leading to severe health impact on the people and environmental damage (Nupur Roy). NO<sub>2</sub> which is one of the GHGs is also responsible for acid rain and respiratory problems (USEPA, 2016). This NO<sub>2</sub> is emitted when fossil fuel burning takes place, so it is released from the coal-based industries and automobiles. 80% of NO<sub>2</sub> is emitted from vehicular emissions (USEPA, 2016). The NO<sub>2</sub> emissions level dropped by 40-50% in Delhi and Mumbai, two megacities according to the satellite images taken from European Space Agency’s Copernicus sentinel-5P satellite during the lockdown period.



Source ESA, nitrogen oxide concentration over India

Sulphur dioxide is also one among the GHGs and major contributor to air pollution. SO<sub>2</sub> even is emitted through burning of fossil fuel, and is released industrial activities. According to the green peace report 2019, India ranked high in emission of anthropogenic sulphur dioxide in the atmosphere. Emissions of SO<sub>2</sub> have increased hugely in the last ten years leading to increased respiratory problems in human beings (Source ESA). According to the ESA report and satellite images it is evident that there is a considerable drop in the SO<sub>2</sub> levels in April 2020 from April 2019.

This visible drop in the SO<sub>2</sub> levels is on account of closure of many industries and restrictions on automobile movement due to lockdown. (Source ESA).

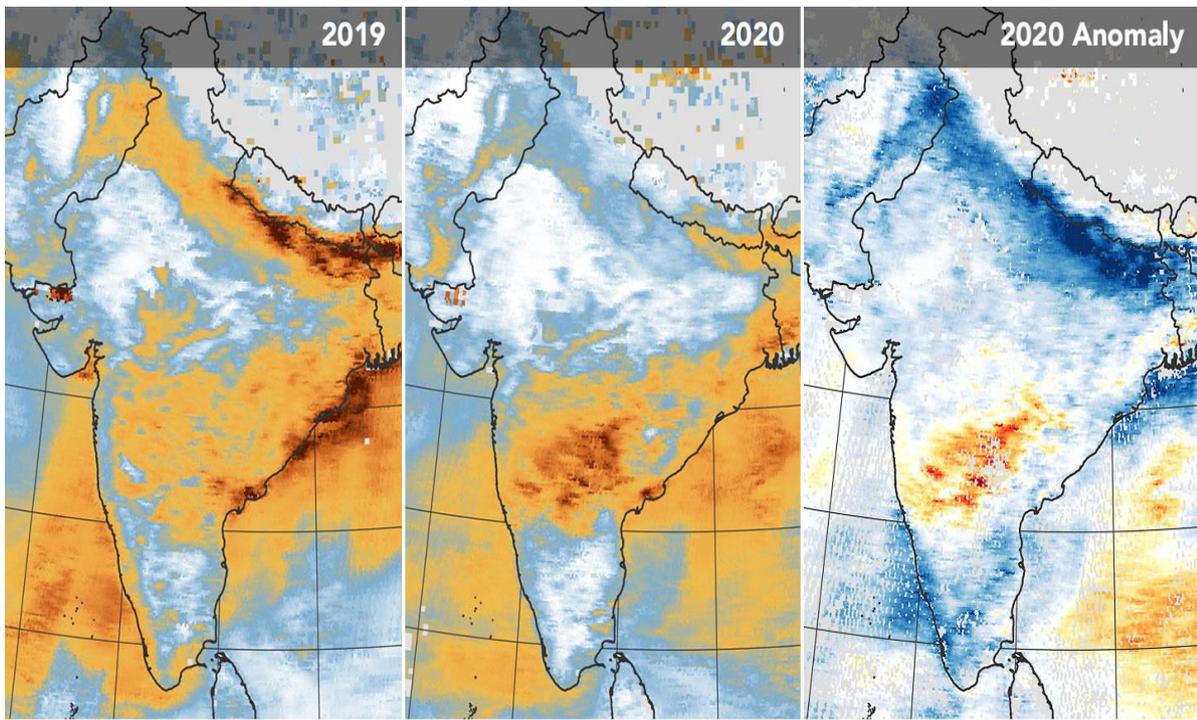
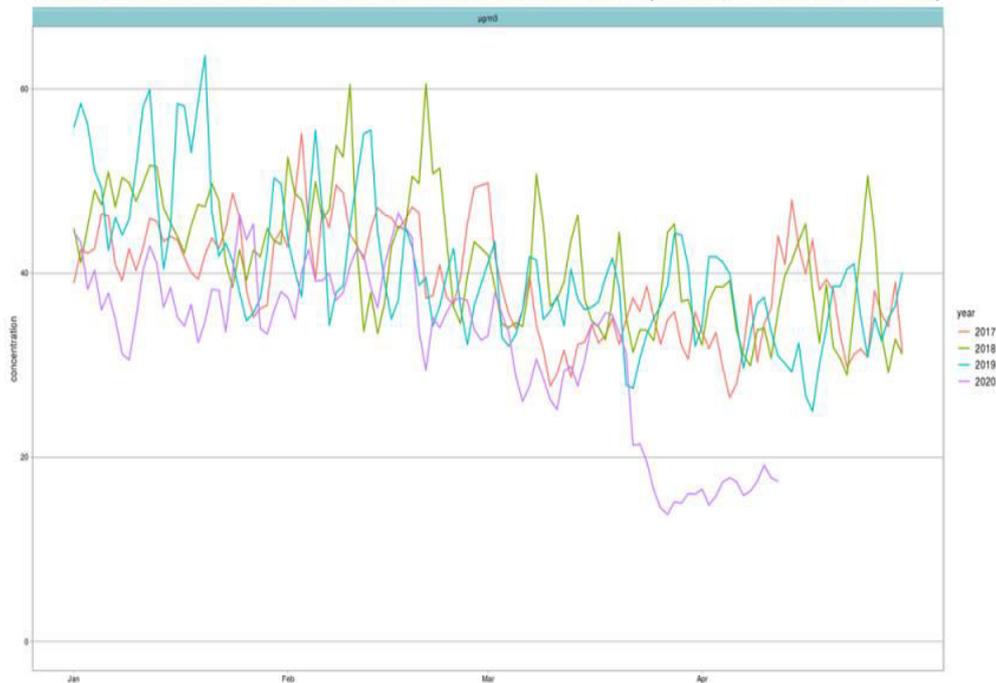


Source ESA, sulphur oxide concentration over India

According to the analysis done by Lauri Myllyvirta & Sunil Dahiya in carbon brief steep fall in Carbon dioxide emissions were seen in the March 2020, due to major Covid -19 restriction. A total of 1% fall in the CO<sub>2</sub> emission in the fiscal year 2020 ending in March was observed after almost four decades due to slowing down of economies reduction in coal and oil consumption. Due to the restrictions on transport, cancellation of air flights led to overall reduction of more than 37% of CO<sub>2</sub> emissions during the nationwide lockdown (IEP, 2020).

Particulate matter also known as aerosols being one of the major air pollutants released through the anthropogenic activities like from construction sites, industries, power plants, automobiles (EPA). During the lockdown period due to the closure of many commercial units, constructional activities the over all emission of PM2.5, PM10 was reduced drastically with 46% and 50% respectively. Aerosol affects visibility. In the capital city Delhi, the PM2.5 levels dropped by 71% within a week's time after lockdown when the registered 11 million cars were taken off the road. The AQI of Delhi which use to be around 200 and when at its peak reaching 900 came down to 20. The reduction in the aerosols helped improved the visibility with clear sky which was evident through the pictures (K. Goswami)

PM2.5 Levels in India before and after national lockdown (CAAQMS data from CPCB)



**Aerosol Optical Depth (AOD)** 0.05 0.25 0.5 0.75  $\geq 1$  **AOD Anomaly (vs 2016-2019 average)**  $\leq -0.5$  0  $\geq 0.5$  No Data  
Source NASA



Source K. Goswami Article in India today

A clear visibility due to reduction in air pollutants in the sky amid lockdown in Noida

### CONCLUSION

The SARS coronavirus thus showed us that environment when shows its supremacy even man has to bow down which is evident through the restriction and lockdown during this pandemic. The lesson what can be taken is our sustainable activities can lead to harmony between man and environment.

Through this study it is evident that anthropogenic activities are leading to deterioration of air quality and through some of the concrete measures taken by the us we can reduce our impact on this environment. In the pandemic period we saw due to forceful restrictions on us the air quality could improve, nature could heal. So why not try willingly without force to nourish the environment.

### RECOMMENDATIONS

- Strict rules and regulations with respect to emission standards.
- Improved infrastructure for people to walk, cycle along the roads to reduce their dependency on fuel-based vehicles thus reducing the emissions of NO<sub>x</sub> and PM.
- Switching from fossil-based energy system to green and clean energy system which will help in reducing the emissions of GHGs.

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**PERFORMANCE OF IPO IN INDIAN STOCK EXCHANGES****Dr. Sanoj Kumar and Dr. Shrikesh Poojari**

Associate Professor, Pramod Ram Ujagar Tiwari Saket Institute of Management, Kalyan, Maharashtra

**ABSTRACT**

*An Initial Public Offer (IPO) is said to be the largest source of funds with long maturity for the company. It is considered to be a quick source of financing for expansion and growth of the business. A number of companies raising capital through IPOs is observed to be increasing. However, investors investing in the IPOs consider it as a means to earn speculative. The average returns by the selected IPOs being quite impressive, investing in IPOs for a short – term can prove to be a lucrative option. In spite of the pandemic situation, a good number of IPOs were observed to be launched and the number still increases till date with a good number of total issue size. The research paper thus, tries to identify the sector wise successful IPOs at NSE and BSE in the last two years. It also tries to explore the relationship between size of the IPO and success rate of the IPOs. The research paper enables to identify the response received by the entrepreneurs from the capital markets, and the businesses for which investors have a positive perception. The research is conducted by referring to real time data of all the IPOs listed on NSE as well as BSE from year 2020*

*Keywords: Initial Public Offerings (IPOs), success rate of the IPOs, price band and subscription level of the IPOs*

**INTRODUCTION**

A corporate may raise capital in the primary market by way of an initial public offer, rights issue or private placement. An Initial Public Offer (IPO) is the selling of securities to the public in the primary market. It is the largest source of funds with long or indefinite maturity for the company. An IPO is an important step in the growth of a business. It provides a company access to funds through the public capital market. An IPO also greatly increases the credibility and publicity that a business receives. In many cases, an IPO is the only way to finance quick growth and expansion. In terms of the economy, when a large number of IPOs are issued, it is a sign of a healthy stock market and economy. IPOs listed on SMEs board are more efficient in price discovery than IPOs listed on Main board. At the same time IPOs listed on SME board have seen lower demand even though they were under-priced. SME IPOs are yet to catch full attention of the research community. The SME IPO market is still evolving and facing issues with respect to transparency and risk. (Wazal Makarand, Sharma Sudesh Kumar, 2020). Even though number of companies raising capital through IPO method are increasing, the investors investing in these

IPOs still view this option as a means to earn speculative. The average total return provided by the selected IPOs on the listing day is 23.67 and the abnormal return provided by these IPOs over and above the market return is 23.14 which are quite impressive. Thus, investing in IPOs for short term can prove to be very lucrative option and can help the investors to make handsome gains in very short period of time. (Manu K.S., Saini Chhavi, 2020). The IPO market has moved towards a trend where a large amount of capital is raised from a small number of issues which also indicated an overall increase in the quality of issues, instead of quantity. Further, the behaviour of the Indian IPO market across various policy periods analysed through dummy regression model shows that due to the introduction of book building concept in 1995 which marked major structural reforms in the IPO market, both number of issues and amount raised gave a negative ACGR during globalisation period. (Singh Amit Kumar, Mohapatra Amiya Kumar, 2020). Book Building is an important concept in the IPO. SEBI guidelines defines Book Building as "a process undertaken by which a demand for the securities proposed to be issued by a body corporate is elicited and built-up and the price for such securities is assessed for the determination of the quantum of such securities to be issued by means of a notice, circular, advertisement, document or information memoranda or offer document". As per SEBI guidelines, an issuer company can issue securities to the public through prospectus in the following manner

- 100% of the net offer to the public through book building process
- 75% of the net offer to the public through book building process and 25% at the price

Determined through book building. The Fixed Price portion is conducted like a normal public issue after the Book Built portion, during which the issue price is determined. The concept of Book Building is relatively new in India. However it is a common practice in most developed countries. Difference between Book Building Issue and Fixed Price Issue: In Book Building securities are offered at prices above or equal to the floor prices,

whereas securities are offered at a fixed price in case of a public issue. In case of Book Building, the demand can be known everyday as the book is built. But in case of the public issue the demand is known at the close of the issue.

**OBJECTIVES:**

- i) To study the success rate of IPOs in Indian Market After covid 2019
- ii) To Study The investor pattern of IPO
- iii) To Study the buying behaviour of Customer

**RESEARCH METHODOLOGY**

The research conference in which the paper is being published is based on themes of leadership, entrepreneurship. With the help of this paper one will be able to identify how the entrepreneurs have received response from capital markets. Which are the businesses for which investors have a positive perception. The research is conducted by referring to real time data of all the IPOs listed on NSE as well as BSE from year 2020 to 20th May 2022. This will help to analyse quantitative factors like success rate of IPOs on listing day, post listing performance. Also a qualitative aspects of selective IPOs is done which takes into consideration various factors like governance, stakeholders and sectoral analysis. The data is collected using real time live updated NSE and BSE website and trading terminals. It is also supported by various research paper published, articles published and Mutual funds house reference material is used.

**Detailed Analysis of the IPOs:**

In spite of COVID-19 disturbance 14 IPOs launched in the year 2020 with total issue size 26180 crore rupees. All the IPOs were oversubscribed, highest oversubscription garnered by FMCG and consumer service sector. Whereas lowest response received by financial services sector. In an unpredictable and volatile year 2021 total 59 IPOs were launched with total issue size of 122112.98 crore rupees raised by primary market. In the first quarter of 2022 and May first half 9 IPOs have already been registered and 31851 crore rupees have already been raised.

Talking about the success of the IPOs, it is categorized on two parameters first is gains on listing day, second is gains post listing. It is observed that stocks of companies from healthcare sector, Chemical, IT has more success on listing day as well as post listing. In 2020 13 IPOs were launched out of which 9 saw a positive listing with average return of 71 %. As on date 11 are trading above IPO price. In 2021 59 IPOs were launched out of which 41 listed with positive returns, 18 with negative returns. Average return for IPOs trading was 30% in year 2021. As on date 33 are trading at price above the IPO price. From January 2021 till first half of May 2022 9 IPOs have been launched, 6 from the same gave positive returns on listing with average of 12%, as of now 5 are trading with price above IPO offer price.

- 56 stocks were hit on listing, number of stocks were not successful on listing.
- 25 stocks were trading negatively on listing day,
- 15 Stocks hit on listing but today trending at below IPO offer price.
- 17 stocks which not hit on and still trading below the IPO offer price.
- 9 Stocks were listed at below IPO offer price but gained momentum later and are trading positively.

There are multiple factors that affect the listing day performance of in IPO. The traders who bet on listing day, not interested in holding stock for long have to bear with the risk of tanking down on the listing day. There are many investors who are now a days applying for IPOs with the intention of making money in short term, as the whole process of application, allotment and listing hardly takes 15- 21 days. Getting allotment of IPOs on your wish-list is a part of luck too. Also, allotment depends on the rate of oversubscription and undersubscription. Short term gains may seem lucrative. If you total the listing day gain for all of the IPOs mentioned above, one would still make decent profit. But one thing that has to be kept in mind is not all IPOs will be allotted to one investor. Secondly, to be become a listing day trader one must be mentally prepared to clear the position on same day not matter you are making profits or losses. However, investors will tend to hold on loss making IPO positions. This will block the capital and one has to pour more money to catch next IPOs. Otherwise situation can be like where one has stuck money in loss making IPOs and no capital to invest further. So trading on IPOs and making profit on listing days has two important aspects; first is getting allotment of a good IPO secondly choosing IPOs after fundamental analysis and then if IPO get allotted then deciding exit point. Here we put some of the case by case IPOs performances as on listing and post listing

1. SBI Cards – Much discussed, potentially good IPO but got hit by COVID-19 and listed at 12% discount it took almost 6 months to gain positive returns.
2. It was observed that in spite of second wave fears of COVID 19, when businesses found out ways to continue in spite of lockdown type restrictions, IPOs like Burger King India, Happiest Mind Technologies, Rossari Biotech gave great listing gains.
3. Year 2021 saw great liquidity also great hike in national indices making favourable environment and optimistic investors.
4. In the year 2021, 9 out of 10 IPOs got oversubscribed more than 20 times of the size of the issue.
5. More than 20 IPOs launched in 2020 gave positive results on listing day giving more than 10% returns however, only 14 from them continued to maintain positive returns post listing also.
6. The companies issuing fresh capital, with less size IPO gave a surprise to its investors Sighachi Industries gave a whopping 207% returns. Paras defence and space technologies gave 185% returns..
7. Whereas One 97 communications(Paytm), Shri Ram Properties, Aditya Birla Sunlife AMC like reputed names disappointed investors on listing days.
8. Tatvachintan Pharma Chemicals was expected to be good and proved good, however many analysts, fundamentalists were not expecting a loss making Zomato IPO to give positive returns on listing day, however it was trading at premium on listing however later the boom based on brand name and social media influence vanished and it tanked low.
9. LIC the big name in Financial Institutions has done lot of market research to find out right pricing, size of issue, waited patiently for right time of launching IPO, went through cumbersome legal formalities. Majority of the markets players expected to gain good however it turned out a heart-breaking failed IPO as on listing.
10. Nazara technologies, G R Infra, Anand Rathi Wealth gained good results.

## CONCLUSION

Efficient market hypothesis has its own charm. It never fails to shock market participants and proves that market discounts everything. There can be not a single strategy to select IPOs with high success rate also whether IPO or secondary market there cannot be success formula. However it does not mean one cannot get returns by trading on IPOs. Technique for making money from IPOs is to first undertake fundamental analysis. Analyse the companies from bottomup approach. Even though the study says, Healthcare, Chemical IT have done great job one has to be selective while choosing the right candidate from every sector. Also from above study it is observed that out of 81, 80 IPOs were oversubscribed. The pricing of the issue is still a matter of concern. Even though IPO lot size is more or less same still pricing range also holds a greater impact on subscription level, this level ultimately creates a buzz and reflects on listing day pricing as well as listing day trades. It can be concluded there is no direct relationship between size of the IPO and its success, some big ticket IPOs like LIC has failed and some small size IPOs like Sighachi Industries gave enormous returns It can be concluded that IPOs with high price range has given average returns but majority of IPOs has followed mid-range pricing have seen better chances of getting higher returns. One has to also pay attention of level of stake of promoters offered in IPO, % allocation to QIBs, HNIs and retail investors and the subscription level. One has to thoroughly understand prospectus or red herring prospectus. One should not go on blindly following market tips and bet in IPOs. One should consult the financial advisor, stock broker before investing in IPOs. Liquidity also should be taken into account because if one invests with intentions of short term gains and if IPO fails then your money may get stuck. Also there are maximum possibilities of gaining from IPO by giving it time to prove itself in the market make money in long term.

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**A STUDY ON GST AND ITS IMPACT ON EDUCATION SECTOR****Dr. Shrikesh Poojari and Dr. Sanoj Kumar**

Assosiate Professor, Pramod Ram Ujagar Tiwari Institute of Management

**ABSTRACT**

*This study aims to understand the taxation system of our Country and its impact on educational sector in India. GST (Goods and service tax) is major tax reform, in indirect tax structure of India since Independence. It was designed to provide the support and enhancing the economic growth of India. The idea to set up GST in India was put forth by Atal Bihari Vajpayee government in 2000, It is the biggest tax reform in India since Independence and was implemented by the Government of India on 1st of July 2017. Prior to this date, the system to collect indirect tax was complex as there were different heads of Indirect taxes but GST introduces the system which unifies 17 heads of Indirect taxes into one single set. At present, taxes are levied on the goods and services by the collective effort of central and state governments Goods and Services Tax is the tax that is levied on all goods and services based on their destination and India adopts a dual GST system by introducing Central GST (CGST) and State GST (SGST). It improves the taxation system of our Country by reducing the multiplicity and cascading effects of taxes and by bringing out transparency and improves compliances in every transaction. GST is the only indirect tax that affects all the sectors and sections of our economy.*

*Education is one of the major sectors of any economy and the future of any country depends on the quality of education provided to the youth. Education promotes understanding, vision, creativity and productivity of people which helps in advancement of a country. In India, Education is provided by public as well as private sector. Indian government's foremost priority is to provide low-cost education to one and all. That's **why education sector** enjoys lots of tax exemption. GST council tried to provide maximum exemptions or keep away from the GST regime to the educational sector.*

*This study analyses GST and its impact on educational Sector based on the secondary data.*

**Keywords:-** Goods and Service Tax, Education Sector, Indirect Tax, Students

**INTRODUCTION**

Education: As per Wikipedia “*Education* is a purposeful activity directed at achieving certain aims, such as transmitting knowledge or fostering skills and character traits. Education is the backbone of a Nation and it directly affects the growth of an economy and providing education is always seen as a social activity rather than a business one. India is one of fastest growing economy in the world, moreover it is one of youngest economy in the world. So for it education plays crucial role for the social and economic growth of India. Education is one of the major service sectors for the economy like India because it will decide how the country will flourish. It promotes knowledge, skills, vision, innovation and creativity etc. of people which help in the growth of a country. India is a mixed economy, Education is provided by both the private and government sector. Central government passes the “Compulsory Education Act 2009” which makes the education compulsory for every child. In India, there are two types of educational institutions, viz public and private. Indian Government supports low-cost education to each people. That's why in India educational sector avails lots of tax exemption in Indirect taxes as well as direct taxes. Direct taxes are those taxes that are directly paid to the government like income tax, TDS, and indirect taxes are indirectly levied and paid to the government like, excise, GST, custom, etc. The Goods and Service Tax (GST) is a very vast concept that simplifies the taxation system and enhances the economy of our country by reducing the multiplicity of taxes and their evasion. GST is an indirect tax and levied on all goods and services supply in India. It is a destination-based tax and it applies to where the goods and services are supplied not by produced. GST has four types of rates of Tax: 5%, 12%, 18%, and 28%.<sup>2</sup> The government of India passed the GST bill on 1st July 2017 to subsume all the indirect taxes to avoid the cascading effects of indirect taxes and to reduce the cost of products and services raised due to multiplicity of taxes. Goods and Services Tax Council, GSTN, and all government agencies, etc., have been regularly deciding to resolve the problems encountered being at different levels to ensure a smooth transition. With the introduction of the goods and services tax at the state level, the extra load of the CENVAT, as well as service tax, is eliminated and the major central and state taxes are included in GST, plummeting the multiplicity of taxes.

**OBJECTIVE OF THE STUDY: -**

- To know the impact of GST on education
- To check the positive and negative sides of GST

- To furnish information for further research work on GST

**NEED OF THE STUDY:**

This study will help us to understand the present taxation system followed by the educational sector. This study is necessary to analyse the positive and negative impact of the implementation of GST on the educational sector. This study also analyse the exempted and non-exempted services from GST of the educational sector

**REVIEW OF LITERATURE**

- Radha Dhaked (2022) in her study Impact of GST Tax on Education Sector helped in defining the education institutes under GST and elaborate various taxable and exempt education service as per GST Regime and a complete list of exemption offered to education institutions.
- Amit Khiyani (2021) in his study elaborate impact of GST and rates of GST in Education Services
- CMA Amit A. Apte (2019) published a book on "GST on Educational Sector" and concluded that only primary services are exempted from GST and any ancillary or incidental services related to primary services are taxable under GST.13
- ICAI (2019) in their study had given all the details about GST on Education Sector, Exempted and Non exempted education educational services and practical approach in collecting GST.
- Dr. Duggappa M.C (2018) in his study "An Empirical Study on Goods and Service Tax" said that the GST system is favourable and brought changes in the tax regime.
- Subhadeep Dutta (2018) in her study "A Study of Goods and Service Tax and its impacts" concluded that after implementation of GST tax rates will be increased by 3-5% resulting in an increase in the cost of services to the end-user. Challenges and issues find out by using SWOT analysis in her study and analyse the impact of GST on student's lifestyles.
- B. Anbuthambi and N. Chandrasekaran (2017) studied "Goods and Services Tax (GST) and Training for its Implementation in India: A Perspective" and concluded that GST was implemented at the national level. Government must provide training and help desk facility for trainers on GST rules and regulations.
- Alpna Yadav (2017) in her study "Impact of Goods and Services Tax on Indian Economy" concluded that GST will solve the problem of complexity of the tax system because it replaces all the indirect taxes into one indirect tax. GST also reduces the cost of goods and services by reducing the cascading effects (tax on tax).
- Dr. R Vasanthagopal (2011) in his study evaluated the impacts of GST on the various sectors like education, agriculture etc and also assessed the positive and negative impacts of GST on various sectors and concluded that it will be the biggest tax reform in India which will increase the revenue of the nation.

**METHODOLOGY**

This study is based on secondary data and does not include any statistical data. The data used for this study has been collected from various online sources, official websites, journal articles, newspapers, related to GST.

**IMPACTS OF GST ON EDUCATIONAL SECTOR**

GST was implemented to avoid double taxation effects but there are some Positive and Negative impacts of GST as below:

**POSITIVE IMPACTS OF GST**

- Educational Institutions providing only education services to students and receiving money as fees for educational services are not required to be registered under GST
- Institutions up to Higher Secondary are exempt from paying any tax and avail tax exemptions.
- Institutions runs by Charitable Trust can avail tax exemption U/s 12A after taking approval from the Income Tax Department.
- Education Services, Training Programs, Vocational Skill Development Course or any other Type of Services Provided by National Skill Development Corporation, Sector Skill Council are fully Exempt from GST.

**NEGATIVE IMPACTS OF GST**

- Most of the educational Institution depends on third-party service providers for Housekeeping, Transport, Catering Services, etc. to fulfil their daily requirements but with the Implementation of GST, cost of

educational sector will rise due to increase in tax rates from 5-12% to 18% and it directly or indirectly affects the education system.

- Coaching fee is subject to 18% and Non-Conventional courses were under the tax bracket of 15 % in the previous tax system but under GST it comes to the tax bracket of 18%.
- Educational training/events organized by foreign entities in India come under the tax bracket of 18% that are attended by professionals, students, corporates, etc.
- Some products shall become more expensive and some products shall be cheaper. For instance, Schoolbag was taxed at 12.5 % under previous taxation system while under GST regime it comes under 18 % tax bracket.
- Ball pen and exercise book under the old system was taxed at 18.68 % and now it comes under the tax bracket of 12 % and become less expensive.

### **LIMITATION OF THE STUDY**

One of the biggest problem is the repeatedly changes in GST rates by the GST council. It is one of the biggest problem in this specific research study. There are lots of scopes available for further researchers with the updated and redesigned data.

### **CONCLUSION**

Education Services provided from preschool up to higher secondary or its equivalent are exempt from GST and those educational institutions provided only education as a service need not be registered under GST. Due to implementation of GST, the cost of educational is increasing due to an increase in the tax rate on different items, and those Institutions and universities who provided education after higher secondary are required to pay GST for services which means transportation, catering, housekeeping, etc. will levy GST and the cost will have to be borne by the institutions. Education is free from GST means output service of institutions.

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**AN EXAMINATION OF THE FACTORS AFFECTING THE INDIAN TWO-WHEELER INDUSTRY**

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**Dr Pratima Singh**

I/C Principal, Chandrabhan Sharma College of Arts, Commerce &amp; Science, Mumbai

**ABSTRACT**

*India's two-wheeler market has grown tremendously and is now an important part of the country's transportation network. The objective of this study is to examine the numerous economic, social, technological, and regulatory aspects that have an impact on the two-wheeler market in India. For legislators, business leaders, and consumers to make knowledgeable choices and develop successful strategies, an understanding of these factors is essential.*

*This study highlights important elements that influence the expansion and development of the two-wheeler sector through a thorough evaluation of the available literature and statistical analysis of pertinent data. Economic factors like income levels, inflation, and interest rates significantly influence consumer purchasing power and the demand for two-wheelers. Social variables affect consumer choices and movement patterns, such as shifting lifestyles, urbanisation, and population demography.*

*Innovation in products and customer preferences are influenced by technological elements such as improvements in engine technology, safety features, and fuel efficiency. Government initiatives, taxation policies, and emission standards also shape the regulatory framework and commercial dynamics of the business.*

*This study offers helpful insights into the potential problems encountered by the two-wheeler sector in India by analysing the elements and their interactions. The results of this study may be used as a foundation for industry stakeholders to create successful plans for long-term expansion, increased competitiveness, and meeting changing customer wants.*

**Keywords:** *Two-wheeler, Economic and Social Factors.*

**OBJECTIVES:**

1. To analyse the Two-Wheeler Industry in India.
2. To identify the various brands that participate in the Two-Wheeler Market in India
3. To understand the reasons for the growth of the Two-Wheeler Industry in India.
4. To identify and analyse the factors affecting the Two-Wheeler Industry in India.

**METHODOLOGY:**

The study is theoretical in nature and is based on existing secondary data that defines the factors affecting the two-wheeler industry in India. Through analysing the various studies, we attempt to understand and identify the factors affecting the concerned industry.

**Over View of the Two-Wheeler Industry in India:**

India has seen rapid expansion in the two-wheeler sector, making it one of the biggest in the world. Due to their cost, convenience, and efficiency in crowded metropolitan areas, two-wheelers, particularly motor-cycles and scoots, are quite popular.

The Indian two-wheeler industry has witnessed a steady increase in production over the years. Contributing to this growth include rising disposable incomes, expanding middle-class, improving infrastructure, and increasing urbanisation. Additionally, the easy availability of financing options has made two-wheelers more accessible to a broader consumer base.

To meet the diverse demands and tastes of its customers, major local and foreign businesses compete in the Indian two-wheeler industry by offering a variety of models. Intense rivalry in the market drives ongoing product innovation, technical improvements, and aggressive marketing tactics.

In India, motor-cycles account for a sizeable percentage of the two-wheeler market, with commuter and luxury models enjoying widespread customer appeal. In recent years, scooters have also gained much popularity, especially among female riders and urban commuters.

Government laws and rules have a big influence on the business world. Technology developments and the adoption of cleaner, safer automobiles are the results of the introduction of tighter emission standards and safety

requirements. Additionally, the government has started several programs and incentives to encourage the use of electric two-wheelers and lessen pollution.

Fuel cost fluctuation, shifting customer tastes, escalating competition from alternative forms of transportation, and the need for sustainable mobility solutions are all issues that the business must deal with. To address environmental concerns and satisfy upcoming regulatory requirements, manufacturers are concentrating on releasing electric and hybrid cars. In India, the two-wheeler market is still thriving overall thanks to several developments in technology, customer behaviour, government policies, and economic growth. The sector is positioned for more growth and transformation in the upcoming year due to changing trends and market needs.

MOTOR- CYCLES			
RANK	OEM	MODELS	Apr-23
1	HERO	SPENDOR	2,65,225
2	BAJAJ	PULSAR	1,15,371
3	HONDA	CB SHINE	89,261
4	HERO	HF DELUX	78,700
5	BAJAJ	PLANTINA	46,322
6	TVS	APACHE	38,148
7	TVS	RAIDER	31,491
8	ROYAL ENFIELD	CLASSIC 350	26,781
9	YAHAMHA	FZ	20,931
10	TVS	SPORTS	18,472
	TOTAL		7,30,702

Source: Zigwheels

#### Participants in The Two- Wheeler Market in India:

India's two-wheeler industry is home to several major companies that dominate the market. Here are some of the prominent two-wheeler manufacturers in India:

- Hero MotoCorp:** Hero MotoCorp is India's top two-wheeler producer. It provides a wide selection of motor-cycles and scooters to meet the needs of various market sectors. The Splendor, Passion, HF Deluxe, Maestro, and Pleasure are some of its well-known models.
- Bajaj Auto:** Bajaj Auto is another leading two-wheeler manufacturer in India. It is known for its diverse portfolio of motor-cycles, including commuter bikes, sport bikes, and performance bikes. The popular models from Bajaj Auto include the Pulsar, Platina, Domineer, and CT.
- TVS Motor Company:** TVS Motor Company is a prominent player in the Indian two-wheeler market. It offers motor-cycles, scooters, and mopeds. TVS Jupiter, Apache, Star City Plus, and XL 100 are some of the well-known models from TVS Motor Company.
- Honda Motor-cycle and Scooter India (HMSI):** It is a subsidiary of Honda Motor Company, Japan. It is known for its wide range of scooters and motor-cycles. Some popular models from HMSI include Activa, Dio, CB Shine, CB Unicorn, and Hornet.
- Yamaha Motor India:** Yamaha Motor India is a renowned manufacturer of motor-cycles and scooters. It offers a diverse lineup of models ranging from entry-level bikes to high-performance motor-cycles. Yamaha FZ, YZF R15, Fascino, and Ray-Z are among its popular models.
- Suzuki Motor-cycle India:** Suzuki Motor-cycle India is renowned for its fashionable and motorbikes that are focused on performance. It provides a variety of bikes, such as sports bikes, cruisers, and commuter cycles. Popular scooters made by the business include the Suzuki Access and Bergman Street.
- Others:** These are only a few of India's top two-wheeler manufacturers. Some further participants add to the industry's competitive environment, such as Piaggio, Mahindra Two Wheelers, and Royal Enfield.

#### Growth and development of the two-wheeler industry in India:

The growth and development of the two-wheeler industry in India have been remarkable over the years. Here are some key factors and trends that have contributed to its progress:

- Growing Demand:** The demand for two-wheelers in India has increased due to urbanisation, a growing middle class, and increased affordability. Two-wheelers are seen as an affordable and practical transportation, especially in crowded metropolitan areas.

2. **Supportive governmental initiatives:** The two-wheeler sector of the automotive industry and other policies and initiatives have been supported by the Indian government. Measures including decreased excise taxes, tax breaks, and loosened license requirements have boosted manufacturing and investment in the industry.
3. **Product Innovation:** To keep up with changing consumer demands, two-wheeler manufacturers constantly release cutting-edge and new models. Features including increased fuel economy, safety improvements, enhanced design, and networking possibilities have aided the development of the industry.
4. **Diversification of Product Portfolio:** Manufacturers have expanded their product portfolios to supply to a wide range of customer segments. This includes motorcycles, scooters, and electric two-wheelers, offering various options in terms of design, performance, and price range.
5. **Market Competition:** Many domestic and foreign competitors seek market dominance in India's two-wheeler business, making it quite competitive. This rivalry has resulted in better product quality, better customer service, and competitive pricing. Customers gain from it.
6. **Rural Market Penetration:** Given the high potential for two-wheeler sales in rural regions, manufacturers have concentrated on growing their presence there. Further aiding the industry's expansion has been more financing choices and upgraded infrastructure in rural areas.
7. **Export Opportunities:** By exporting their goods to several foreign countries, Indian two-wheeler producers have widened their market reach. This has helped build brand awareness, technology partnerships, and income generation worldwide.
8. **A shift toward electric two-wheelers:** With a focus on sustainability and environmental issues, electric two-wheelers are becoming more popular in India. To keep up with changing consumer tastes and governmental requirements, manufacturers are investing in the research and development of electric cars.

Overall, the growth and development of the two-wheeler industry in India can be attributed to factors such as increasing demand, favourable government policies, product innovation, market competitiveness, and the exploration of new market segments. The industry remains to evolve, driven by changing consumer needs, technological advancements, and the pursuit of sustainable mobility solutions.

#### **Two-wheeler industry analysis:**

The two-wheeler industry analysis examines various aspects of the industry, including market trends, competitive landscape, growth drivers, challenges, and prospects. Here are some key mechanisms typically included in a two-wheeler industry analysis:

1. **Market Size and Growth:** Assessing the overall size of the two-wheeler market in terms of sales volume, revenue, and market share, analysing historical data, and projecting future growth rates based on factors such as population growth, urbanisation, and economic indicators.
2. **Market Segmentation:** Dividing the market into several categories depending on the kind of product (motor-cycles, scooters, mopeds), price range, engine size, target market, and geographic areas. Knowing each segment's market share and potential for expansion.
3. **Analysing the industry's top companies:** market shares, product portfolios, price tactics, distribution networks, and branding efforts. Determining each player's main SWOT analysis strengths, weaknesses, opportunities, and threats.
4. **Customer behaviour and Preferences:** Investigating customer purchasing patterns, preferences, and the elements that influence buying decisions, including cost, brand reputation, features, appearance, fuel efficiency, and after-sales support. It was recognising new trends and changes in customer tastes.
5. **Regulatory Environment:** Analysing the effects of governmental policies and regulations on the market, including import/export laws, safety standards, tax laws, and incentives for electric car use and evaluating the impact of regulatory changes on market dynamics, price, and product development.
6. **Technological Advancements:** Analysing technological innovations in the industry, such as engine technology, hybrid and electric vehicles, connectivity features, and safety enhancements. Understanding the impact of technology on product differentiation, competitive advantage, and consumer demand.

7. **Supply Chain and Distribution:** Analysing the industry's supply chain management techniques, dealership networks, and distribution channels, evaluating the effectiveness of inventory management, aftermarket services, and logistics.
8. **Opportunities and Difficulties:** Finding chances for growth, such as underserved market niches, geographic expansion, product diversification, or strategic alliances, and evaluating obstacles, such as rising competition and changing raw material prices. Compliance with regulations and shifting customer expectations.
9. **Future Outlook:** Offering information on the two-wheeler industry's potential growth areas. Such as new trends, technological changes, industry consolidation, and future growth sectors. I predict market trends and suggest competitive and long-term growth plans.

Overall, a comprehensive two-wheeler industry analysis combines qualitative and quantitative research to completely understand the industry's current state, challenges, and opportunities for stakeholders.

#### MAJOR FINDINGS OF THE STUDY:

1. **Economic factors:** Income levels, inflation, and interest rates greatly influence consumer purchasing power and demand for two-wheelers. Predicting market trends and consumer behaviour requires an understanding of these economic forces.
2. **Social factors:** Changing lifestyles, urbanisation, and population demographics are vital in shaping consumer preferences and mobility patterns. Identifying the social factors that influence the two-wheeler industry helps develop targeted marketing strategies and product innovations.
3. **Technological factors:** Product innovation and customer preferences are influenced by improvements in engine technology, safety features, and fuel efficiency. Understanding the technology drivers of the two-wheeler market may help businesses remain competitive and satisfy changing customer wants.
4. **Regulatory factors:** The two-wheeler sector's operational environment and market dynamics are significantly impacted by emission standards, taxation laws, and government initiatives. Regulation adherence and making use of government initiatives may have an impact on the industry's development and profitability.
5. **Others:** Possibilities for growth in the two-wheeler sector, such as the potential for electric two-wheelers or market expansion in particular locations, may be identified by the research, along with associated difficulties. Challenges should also be highlighted to help industry stakeholders manage concerns, such as fluctuating fuel prices or increasing competition.

It's important to note that the specific findings of a study would depend on the research methodology, data analysis and variables considered.

#### CONCLUSION:

In conclusion, this study on factors influencing the two-wheeler industry in India highlights the multifaceted nature of the industry's dynamics. Economic factors, social trends, technological advancements, and regulatory influences all significantly shape the industry's growth and competitiveness. Understanding these factors is vital for industry stakeholders to make informed decisions, develop targeted strategies, and address emerging challenges. By recognising the opportunities and challenges within the industry, businesses can adapt and innovate to meet evolving consumer demands and capitalise on market trends. This study provides appreciated insights that can guide policymakers, industry players, and researchers in navigating the complex landscape of the two-wheeler industry in India.

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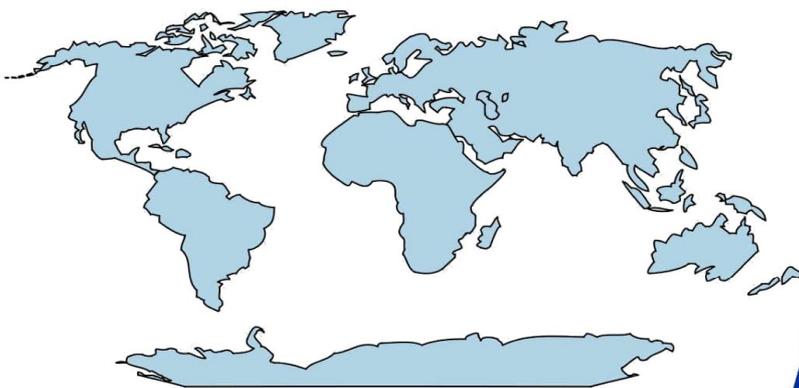
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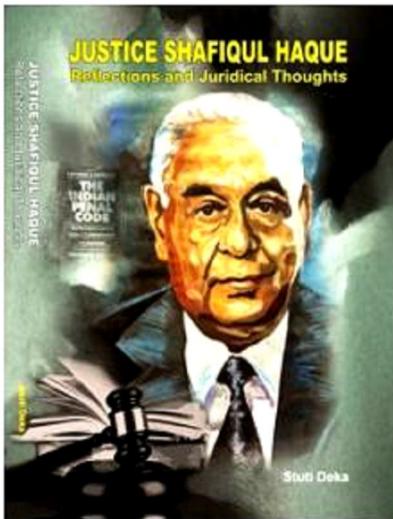


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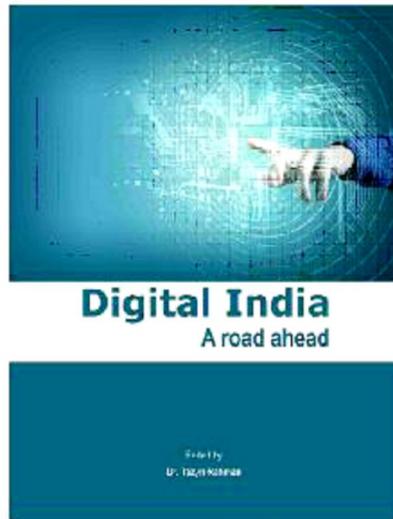
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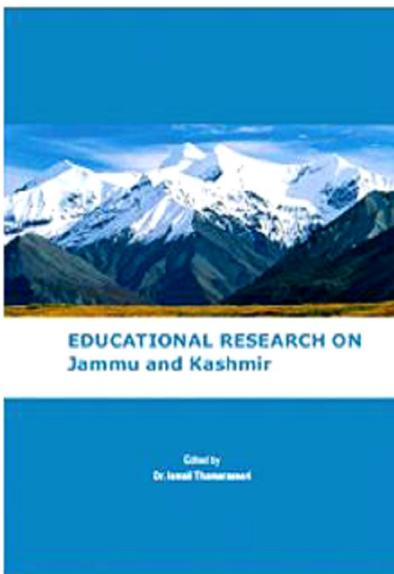
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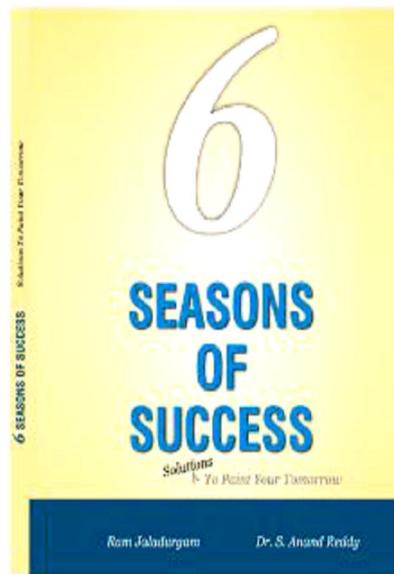
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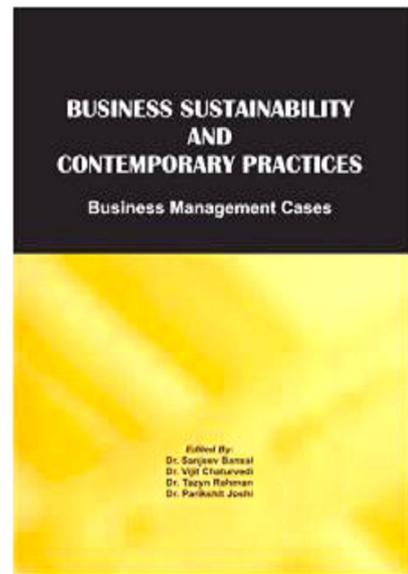
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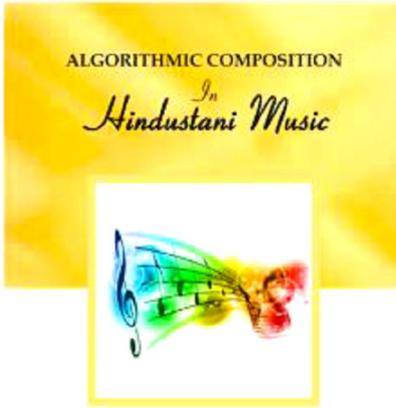
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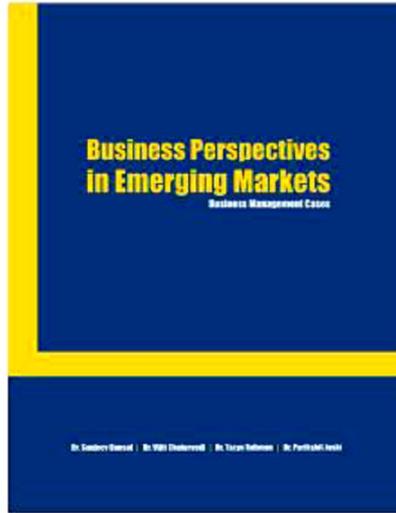
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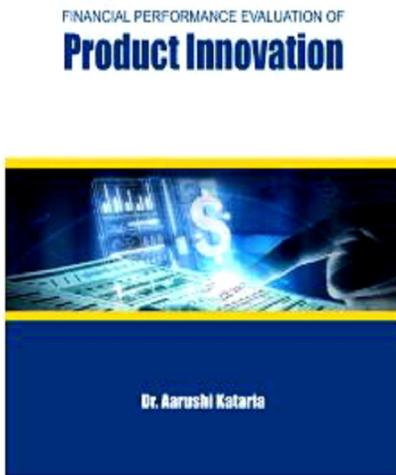
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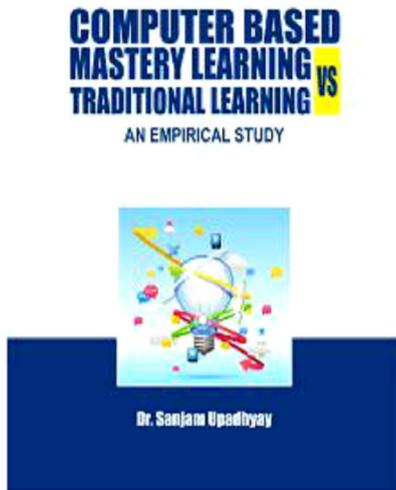
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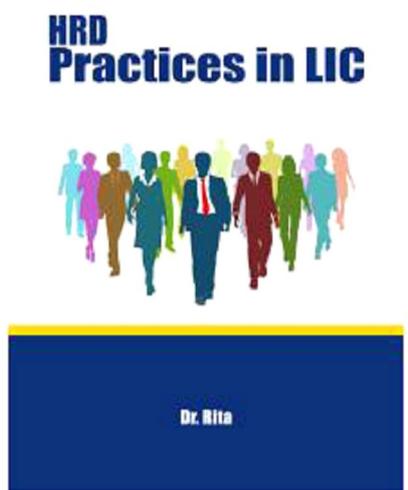
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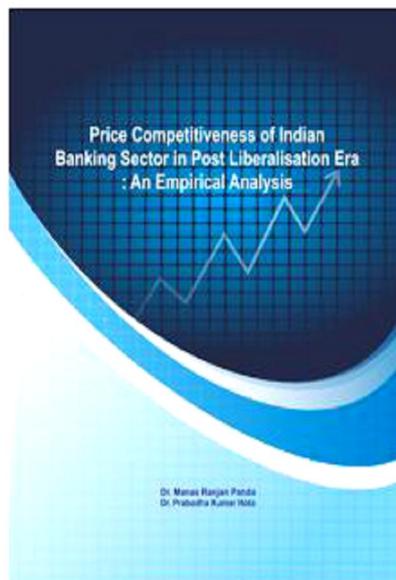
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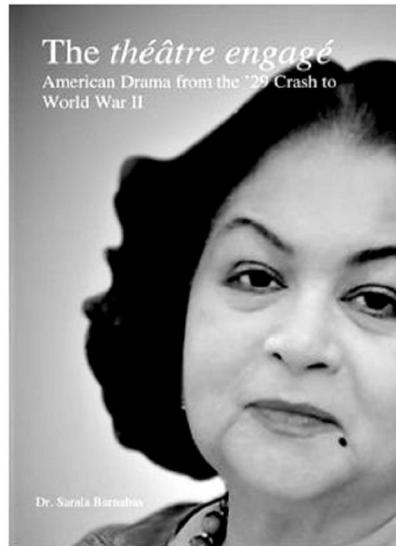
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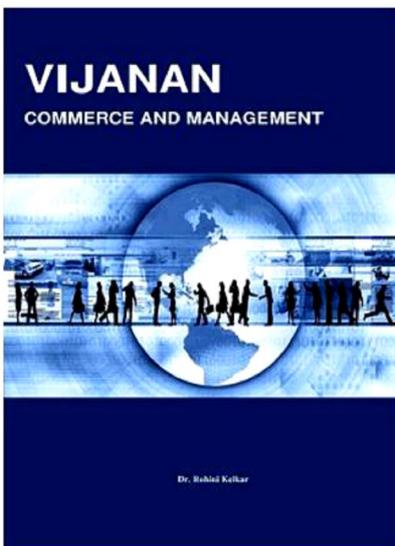
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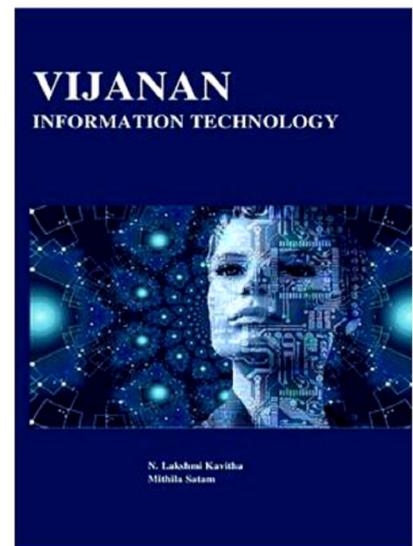
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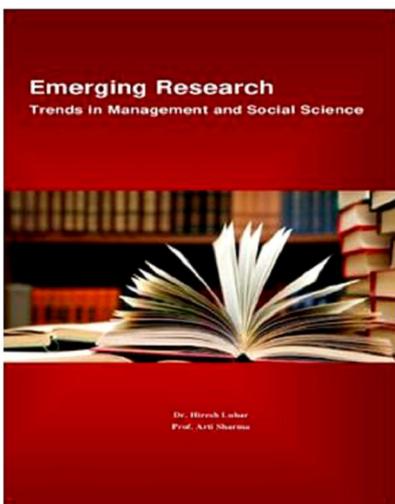
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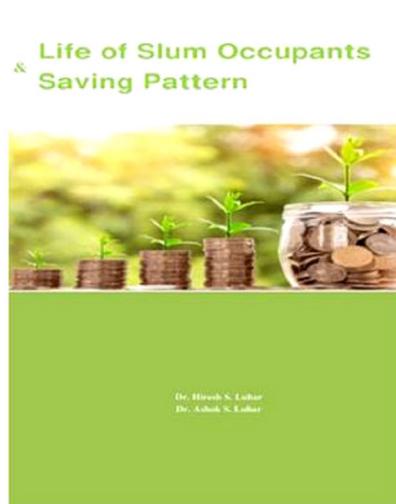
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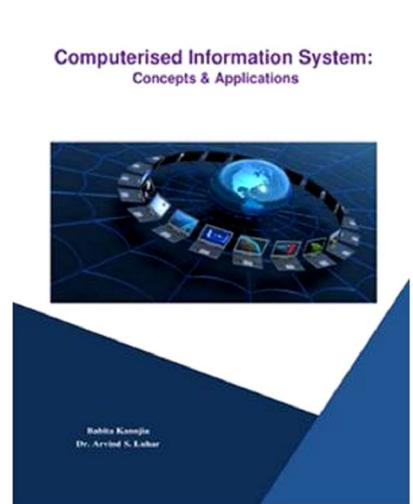
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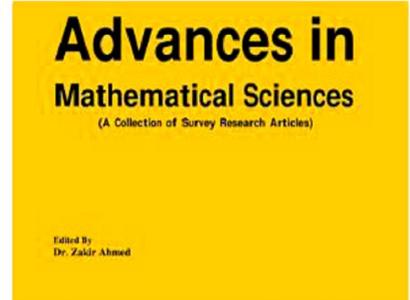
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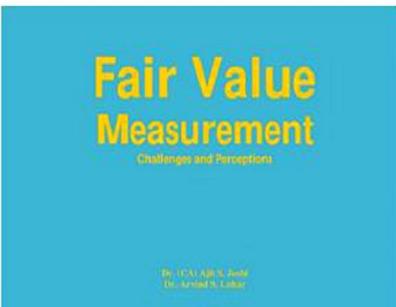
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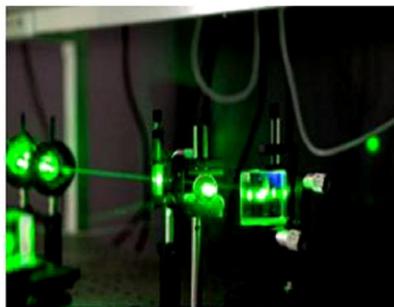
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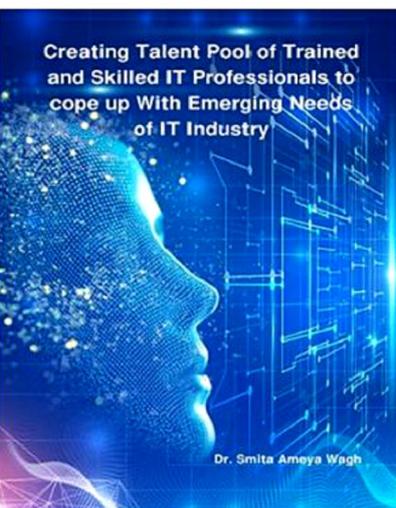


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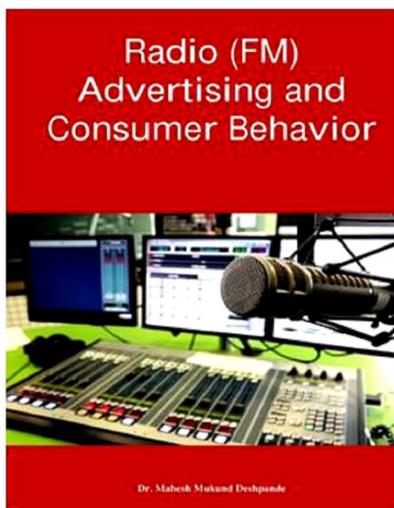
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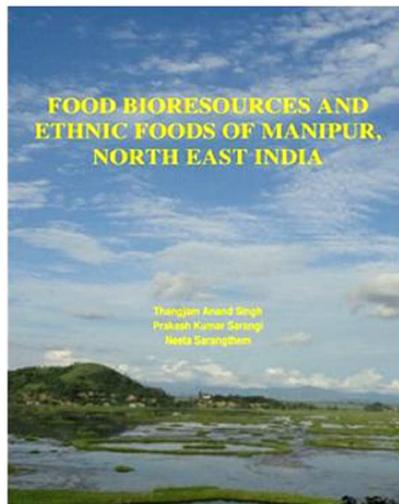


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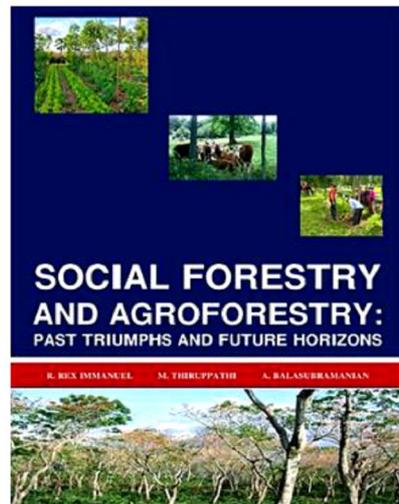
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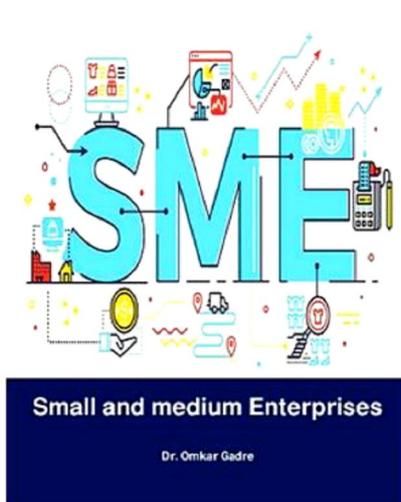
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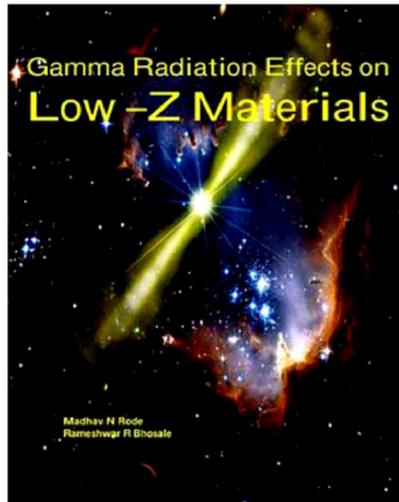
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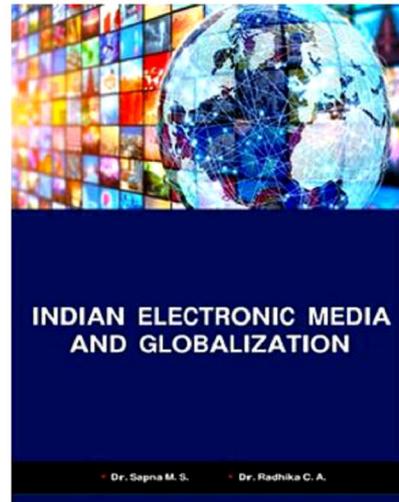
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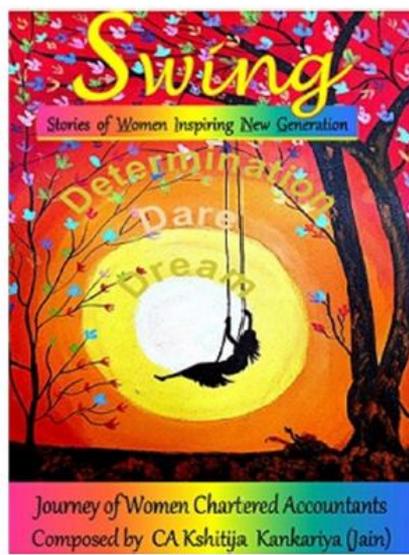
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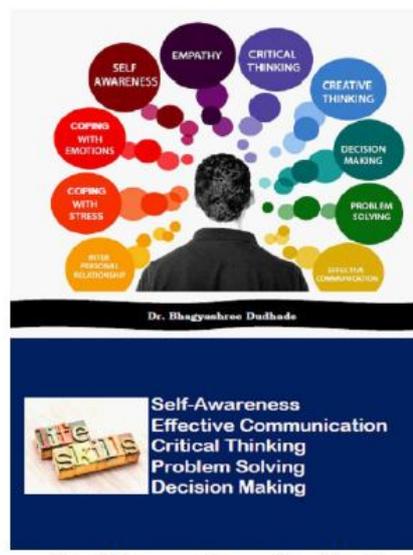
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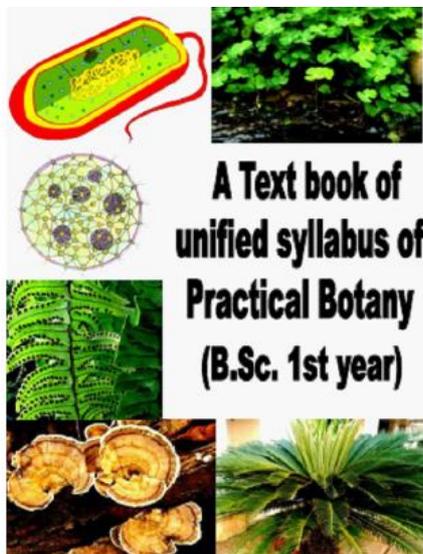
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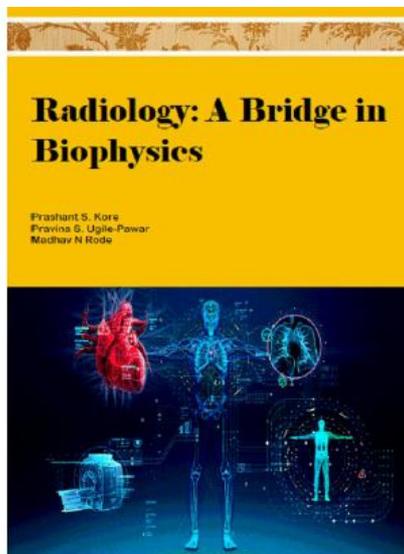


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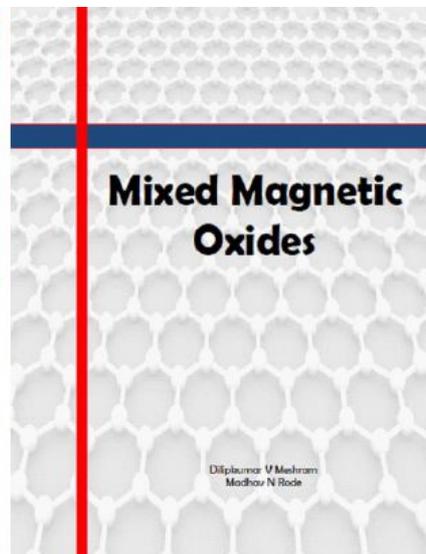
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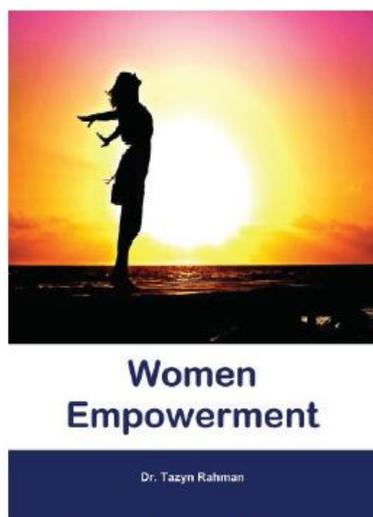
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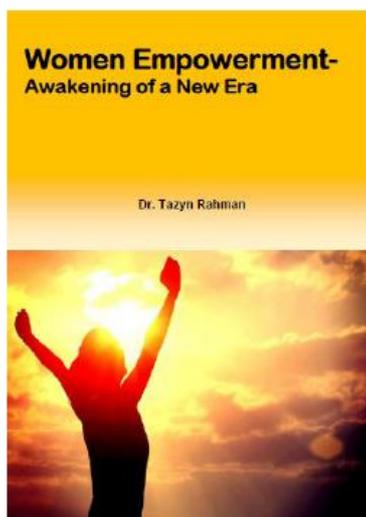


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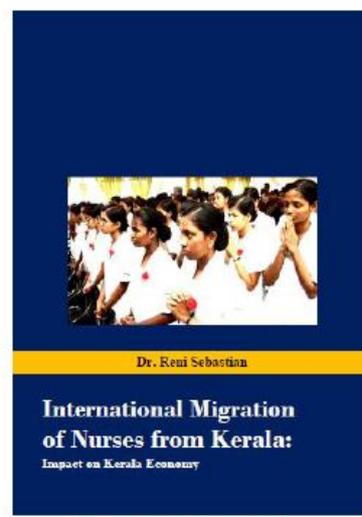
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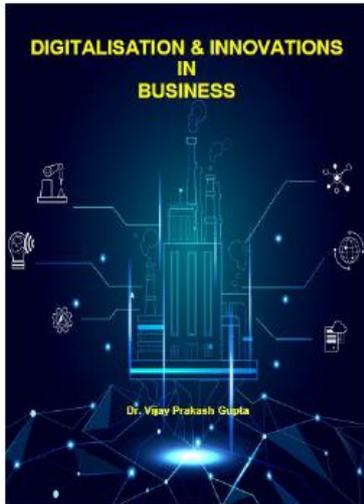
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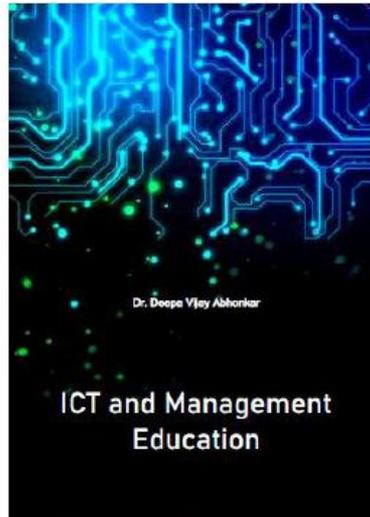


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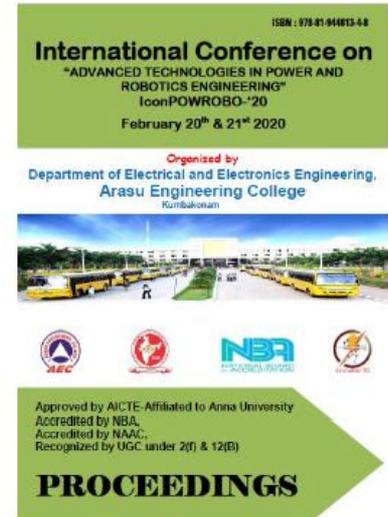
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